

# Annual Report 2019-20



**INDIAN STATISTICAL INSTITUTE**





88<sup>th</sup>  
**Annual Report**  
**2019-20**

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**Indian Statistical Institute**

203, Barrackpore Trunk Road, Kolkata - 700108

<http://www.isical.ac.in>





## From the Director's Desk

I am delighted to present before you the Annual Report 2019-20 of the Indian Statistical Institute. Established by P.C. Mahalanobis in 1931 in Kolkata, the Institute has now grown into a unique seat of higher learning with a pan India presence. The vision of Mahalanobis was to establish Statistics as a unifying force between different disciplines. The Institute continues to nurture this vision; that is all the more relevant today with the ever-expanding role of data for scientific advancement, and with interdisciplinarity being the norm rather than the exception. True to this vision, the Institute scientists lay emphasis on both deep theoretical studies and advanced applications. The Institute scientists also extend their expertise to the government in various capacities, in policy formulation, policy evaluation and intervention, and capacity building.

The year 2019-20 saw the Institute continue to flourish under the able leadership and guidance of the Institute President Shri Bibek Debroy and the Chairman of the ISI Council, Professor Goverdhan Mehta. The Institute conducted its 54<sup>th</sup> Convocation on 23<sup>rd</sup> January 2020. Prof. Joachim Frank, Professor at Columbia University, New York, and a Nobel Laureate, was the Chief Guest of the event, and delivered a mesmerizing Convocation speech.

The Institute was delighted and honored to felicitate Shri Pranab Mukherjee, former President of India and former Chairman of ISI Council from 2004 to 2012, on his receiving the Bharat Ratna, the highest civilian honor of the country. Shri Mukherjee enthralled the audience with his reminiscences and erudite speech. A photo album capturing the special moments of his association with the Institute was released on this occasion.

The Institute welcomed a large number of distinguished visitors to its different campuses both from India and abroad. International Women's Day is being celebrated in the Institute for a few years now. In March 2020, Smt Alokandana Ray, famous danseuse who has been using dance to change the lives of convicts, visited the Headquarter in Kolkata and shared her experiences with the members of the Institute. A photography contest was organized on this occasion. Several conferences and workshops were organized throughout the year in the various scientific divisions across the

“At ISI, we have also risen to the occasion by helping the government with the expertise that is available in the Institute, by conducting research on covid-19 related areas, providing local technical support in covid-19 testing and through community service.”

different locations of the Institute. Faculty members initiated the Young Statisticians Meet: Data Science in Action, which is likely to be the first of a series targeting PhD and master's students in Statistics, creating a platform to expose them to current data driven problems from the academia and the industry. The recently formed Center for Artificial Intelligence and Machine Learning conducted its first short term course on Machine Learning for Practitioners in November 2019 and followed it up with an Indo-French Joint workshop on Statistical and Artificial Intelligence for Data Science in January 2020 which saw, among other things, seven speakers from France deliver lectures here. The Centre for research on the Economics of Climate, Food, Energy and Environment (CECFEE), ISI Delhi is a part of the Environment for Development (EfD) Network and is receiving financial support for conducting environment related studies. The Regional Math Olympiad examination and the Indian National Mathematical Olympiad Training Camp (INMO) training camp were conducted in ISI Bangalore. The Library, Documentation and Information Sciences Division in collaboration with Physics and Applied Mathematics Unit conducted the extremely well received program called the Astro-scope for the Youngsters: A Space Odyssey. The Institute hosted many such activities as detailed in a section of the Annual Report.

The Institute faculty and students continue to be recognized for their scientific contributions. Neena Gupta received the Shanti Swarup Bhatnagar prize in Mathematical Sciences 2019, becoming the youngest mathematician to win in this category. Former Director and Head, RC Bose Centre of Cryptology and Security, Bimal K.Roy was appointed Chairman of the National Statistical Commission. Ritabrata Munshi has been elected Fellow of the Indian National Sciences Academy. Rajat Shubhra Hazra has been elected Fellow of the Indian Academy of Sciences. Ashish Ghosh has been elected as a Fellow of the National Academy of Sciences, India and has also received the IEEE-GRSS 2019 Regional Leader Award. Abhiroop Mukhopadhyay has received Mahalanobis Memorial Medal (National Award for 2018). Arup Bose has been appointed as a member of the West Bengal State Council of Science and Technology. Abhik Ghosh has been selected for the NASI Young Scientist Platinum Jubilee Award 2019 in the field of Earth Science, Mathematics and Physics; Kiranmoy Das has been selected as an Associate of the Indian Academy of Sciences, Bangalore. The International Indian Statistical Association (IISA) selected Rituparna Sen for the Young Statistical Scientist Award (YSSA) in the "Application" category. Saurabh Ghosh and Banasri Basu have been elected as Fellows of West Bengal Academy of Sciences and Technology for the year 2019. Partha P. Majumder, Emeritus Professor of the Institute has been selected as a President of the Indian Academy of Sciences for the term 2019-2021. K.B. Sinha, Former Director and Emeritus Professor of the Institute, has received the Srinivasa Ramanujan Medal, 2019, from INSA. Our Senior Research Fellow Abhijit Patra, working under the Supervision of Dr. Dilip Saha has received the best poster award at Rock Deformation related Conference in Switzerland while another senior research fellow Ankita Mandal, working under the supervision of Pradipta Maji, has received the 1<sup>st</sup> prize in the 9<sup>th</sup> IDRBT Doctoral Colloquium (2019). Sujata Ghosh has been elected a Jury Member of E.W. Beth Dissertation Prize, 2019. The 2019 Simon Marais Mathematics Competition for undergraduates in Asia-Pacific region saw a number of ISI students being placed in the top quartile. In particular Shrivathsa Pandelu from ISI Bangalore stood 7<sup>th</sup> in the individual category, the highest position obtained from India. From ISI Kolkata two have been selected for the Stonehage Fleming /Marais Prizes in the individual category, and a pair of students has been selected for the same prize in the pairs category. Our former M. Stat student of 2014, Souvik Dhara has been awarded Stieltjes Prize for Best PhD Thesis of 2018 in Netherlands. The Institute is proud of all of them.

The regular academic degree programs of the Institute are going strong as usual. The post graduate diploma in statistical methods and applications that was started in the North-East Centre of the Institute in Tezpur has now been initiated in the Chennai Centre of the Institute as well. The North-East Centre of ISI moved to its new campus in June 2019. The second Six Sigma program has been conducted in the Giridih branch under the guidance of colleagues from SQC&OR division. The third batch of students of the two-year Post Graduate Diploma in Business Analytics course, conducted jointly with the Indian Institute of Management Calcutta and Indian Institute of Technology, Kharagpur, have graduated in 2019, and have been very well placed. This program has been ranked at fourteenth position in the QS World University Ranking 2019 in the domain of Masters in Business Analytics. The Statistical Training Diploma, serving officials and students from different countries, is also running successfully in ISEC.

The Cell for Collaboration with Academia, Industry and R&D labs has been active in handling the externally funded projects and consultancy activities in the Institute. MoUs have been signed/extended between ISI and several other organizations from the government, industry and academia. Apart from these, the Institute is working very closely with the Government of India and various state governments for solving social problems and for improvement of services being offered by the government, in addition to conducting a large number of training programs for government officials. The different Units of the SQC&OR division continue offering their expertise for training personnel from the industry towards developing up-to-date quality management systems and helping solve critical problems of quality, reliability and productivity. Further details are provided in a section of this Annual Report.

Towards the end of this financial year, we realized the devastation that a virus can wreak on this entire world challenging each and everyone, especially the scientists. At ISI, we have also risen to the occasion by helping the government with the expertise that is available in the Institute, by conducting research on covid-19 related areas, providing local technical support in covid-19 testing and through community service.

I remain grateful to the President of the Institute, Shri Bibek Debroy, Chairman, Economic Advisory Council to the Prime Minister and Chairman of the Council of the Institute, Prof. Goverdhan Mehta, FRS, University Distinguished Professor & Dr. Kallam Anji Reddy Chair, University of Hyderabad, as well as to all members of the Council for providing valuable advice at various stages for smooth functioning of the Institute. I am thankful to the Secretary, Ministry of Statistics and Programme Implementation and all other officials of the Ministry of Statistics and Programme Implementation, Government of India and Members of the Section 8(1) Committee for their active support. I thank all the scientific and non-scientific workers, students and well-wishers of the Institute for extending their cooperation for the all-round development of the Institute.

March 31, 2020



Sanghamitra Bandyopadhyay

# Preface

The publication of the Annual Report (2019-2020) this year had its own share of pitfalls – the delay was primarily due to the Covid-19 pandemic situation which brought about a pause in every sphere of life. While putting together this report, amidst many online meetings, it was decided to include the activities of the two well-preserved Museums located within the Kolkata campus. A new section on the Geology Museum and the PC Mahalanobis Memorial Museum & Archives under other academic activities has been added, to provide a glimpse of some of the notable collections and current activities of the museums which need a wider audience in today's academic world.

The pandemic situation has also provided an opportunity for change and has been a big digital leap towards successfully adapting to changing situations. Many new initiatives have been undertaken during the reporting year. Two such commendable initiatives have been reported from the North-East Centre of this Institute. Work on identification and documentation of the existing flora and fauna through reconnaissance surveys has been initiated at the Centre's new campus at Tezpur since June 2019 to assess, monitor and improve the campus biodiversity. A webpage documenting the campus biodiversity is also being developed for the purpose. An annual newsletter, 'Foxytail' (named after Assam's state flower), was conceptualized in December 2019 to report the events and activities of the new Centre.

The help and support of everyone who have contributed to this report is gratefully acknowledged and we look forward to suggestions for improvement, if any. We sincerely regret any errors or omissions that may have crept in despite our best efforts.

## The Editorial Board

Anjana Dewanji	- Chairperson		Preeti Parashar	- Member
Amita Majumder	- Guest Member		Rita Saha Ray	- Member
Amita Pal	- Member		S.K. Neogy	- Member
Bimal Kumar Roy	- Member		Sujan Dutta	- Member
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Manoj K. Pandey	- Member		Kishor Satpathy	- Member-Joint Convener
Md Zafar Anis	- Member		Durgam Giri	- Member-Joint Convener

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01

# THE INSTITUTE



# 1.1 Journey of the Indian Statistical Institute

1931-1960

- PC Mahalanobis establishes ISI
- First international journal of Statistics in India, Sankhya, Foreword by Rabindranath Tagore
- Path breaking discoveries by ISI scientists:
  - Mahalanobis distance, large scale sample survey method - PC Mahalanobis
  - Cramer-Rao Bound, Rao-Blackwell Theorem - CR Rao
  - BCH Error correcting codes - RC Bose
  - Theory of large deviations - SRS Varadhan
  - Bahadur Efficiency and Basu's Theorem in Statistics
- National Sample Survey conceived in ISI
- 1950-UNESCO empowered ISI to train statisticians of developing countries – International Statistical Education Centre (ISEC)
- Second Five-Year Plan drafted
- ISI designs the first analog computer in India
- First digital computer in India, HEC-2M, installed in ISI
- Dinosaur fossil, *Barapasaurus tagorei*, discovered by ISI geologists

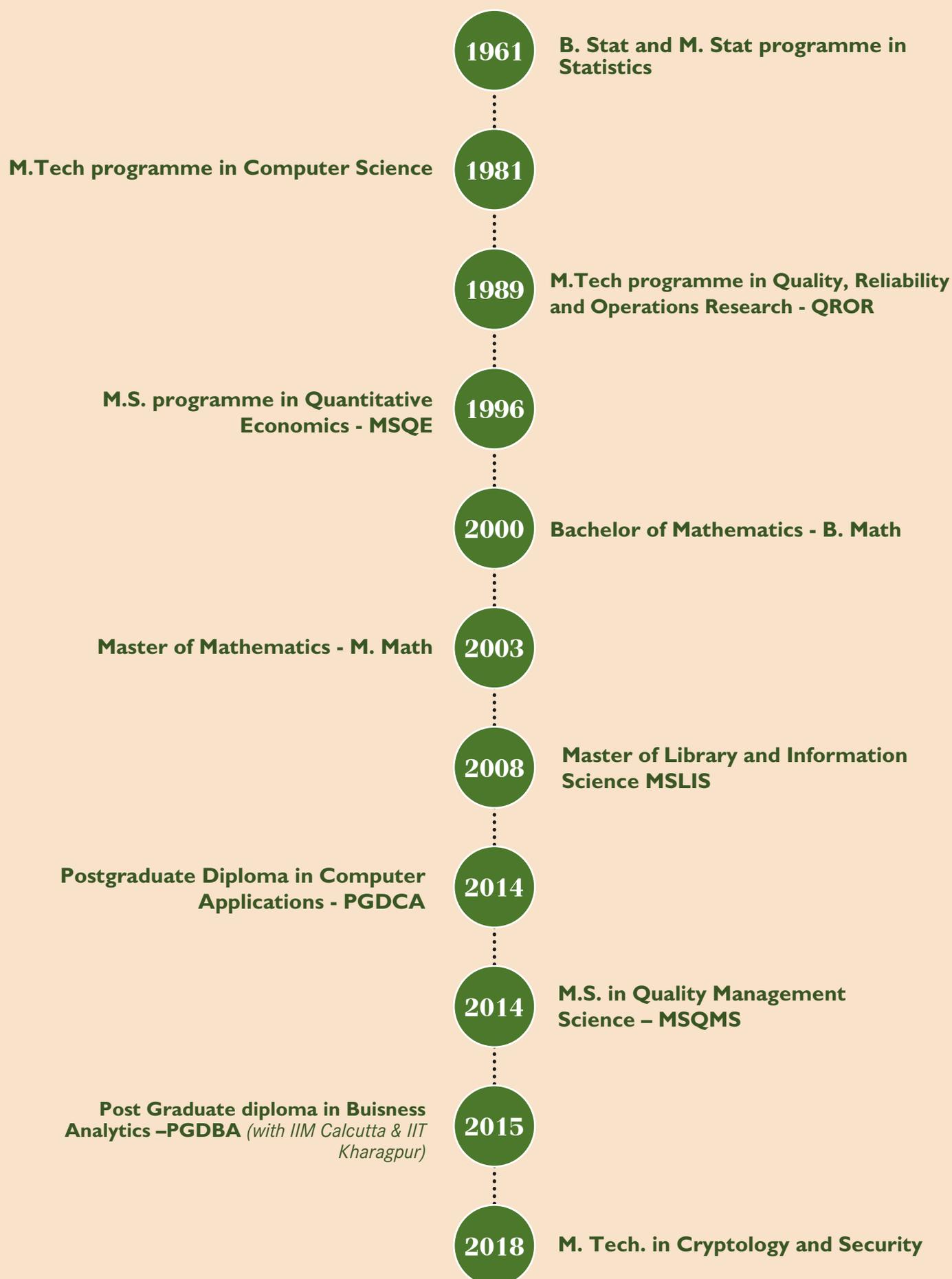
1961-2010

- Delhi Centre of ISI established
- First digital computer (ISIJU-1) built
- Knowledge-based computing systems
- Bengaluru Centre of ISI established
- Precursor to modern Artificial Intelligence and Data Analytics research in India
- Genomic Study, Bio informatics, Pattern Recognition, Image Processing, Machine Learning
- Introduction of Soft Computing in India and establishment of the first Centre for Soft Computing Research in Asia
- Outreach program: North-East and Jharkhand
- 29th June declared as the National Statistics Day at ISI by the then Prime Minister, Dr. Manmohan Singh in 2006
- Chennai Centre of ISI established
- Centre for Soft Computing Research
- Pioneering work in Artificial Intelligence and Machine Learning, Bioinformatics, Computational Genetics, Cryptology, Indian Language Technologies, Population Genomics, Soft Computing Technology

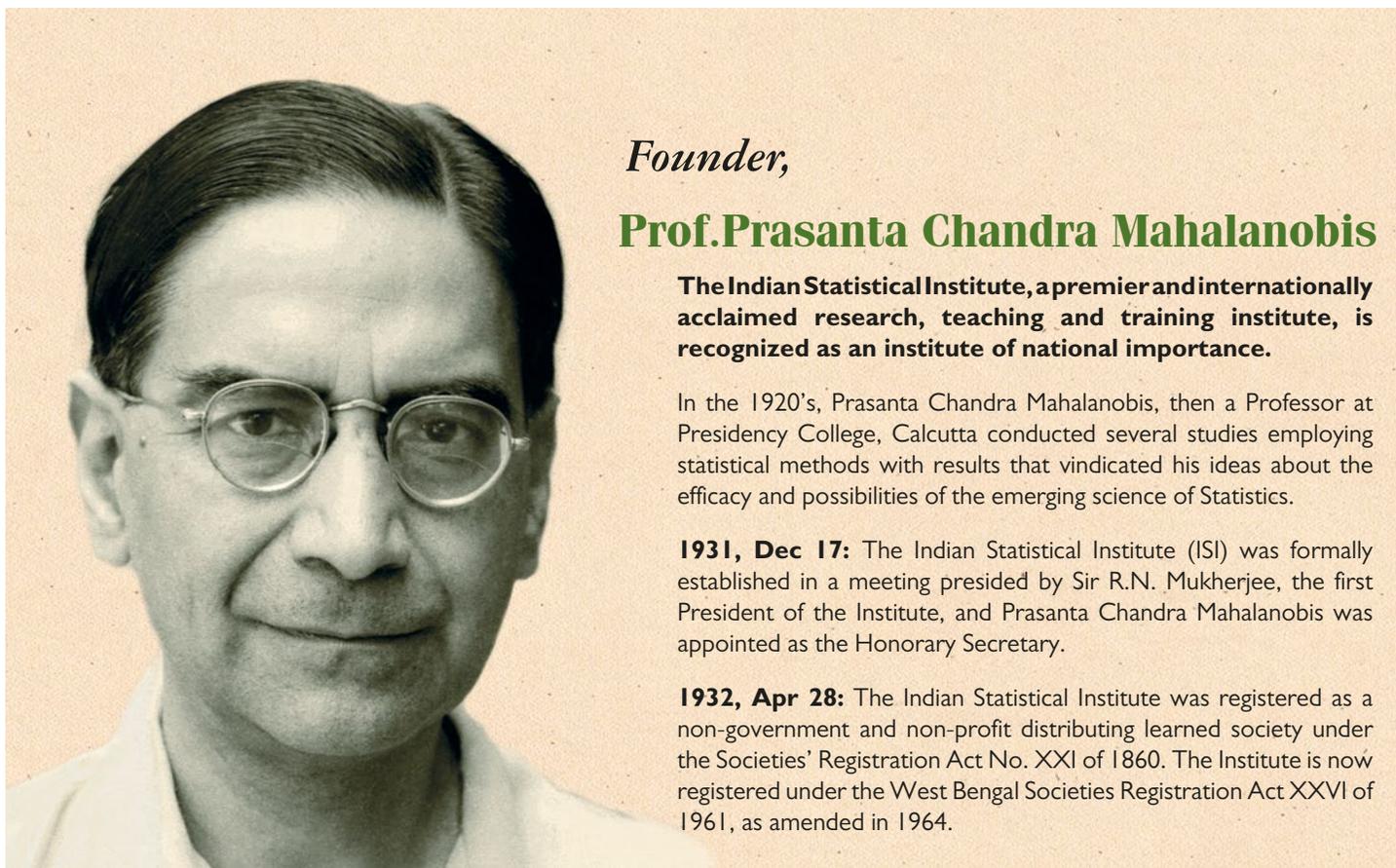
2011 - till date

- North-east Centre of ISI established for development of the region
- RC Bose Centre for Cryptology and Security established
- Teaching and training in Official Statistics & Policy Research
- Seminal contributions in Game theory, Algebraic Geometry, Poverty and Inequality measures, Disease Genetics, Granular Computing
- Discovery of *Shringasaurus indicus*
- Centre for Artificial Intelligence and Machine Learning established
- Computational and experimental biology research; cancer, auto-immune and neuro-degenerative diseases

Time line of some specialized programmes introduced in ISI –thinking ahead of times!



## 1.2 A Brief History of The Institute



*Founder,*

### Prof. Prasanta Chandra Mahalanobis

**The Indian Statistical Institute, a premier and internationally acclaimed research, teaching and training institute, is recognized as an institute of national importance.**

In the 1920's, Prasanta Chandra Mahalanobis, then a Professor at Presidency College, Calcutta conducted several studies employing statistical methods with results that vindicated his ideas about the efficacy and possibilities of the emerging science of Statistics.

**1931, Dec 17:** The Indian Statistical Institute (ISI) was formally established in a meeting presided by Sir R.N. Mukherjee, the first President of the Institute, and Prasanta Chandra Mahalanobis was appointed as the Honorary Secretary.

**1932, Apr 28:** The Indian Statistical Institute was registered as a non-government and non-profit distributing learned society under the Societies' Registration Act No. XXI of 1860. The Institute is now registered under the West Bengal Societies Registration Act XXVI of 1961, as amended in 1964.

### Objectives:

- To promote the study and dissemination of knowledge of Statistics, to develop statistical theory and methods, and their use in research and practical applications generally, with special reference to problems of planning for national development and social welfare;
- To undertake research in various fields of natural and social sciences with a view to the mutual development of Statistics and these sciences;
- To provide for, and undertake, the collection of information, investigations, projects, and operational research for purposes of planning and the improvement of efficiency of management and production.
- To undertake any other ancillary activities in fulfillment of the objectives (i), (ii) and (iii).

The Institute started functioning initially from a room of the then Presidency College (now Presidency University) with enduring support from a number of distinguished personalities and devoted scholars in Calcutta. Over the first two decades, which turned out to be a glorious chapter in the annals of Indian science and institution building, the ISI embarked upon a series of pioneering programmes involving the application of Statistics in search of solution of the urgent and live problems of the country. Such programmes included innovative projects on sample surveys of yield and land utilization of crops, socio-economic after-effects of the Bengal famine and problems of flood research. These innovations and methodological research have since become classics in Statistics. At the same time, the training of scientific personnel began to grow. This also encouraged high level research and brought into focus the need for publication of the research results, for which *Sankhyā*, the first international journal of Statistics in the country came into being in 1933.

### ISI and Nation Building

When India became independent, the Institute held a pivotal role in the task of nation building through the brilliant choice of the area of surveys, which were socially and nationally relevant. The patronage and invaluable contribution of Sir Ronald A. Fisher played an important role. Led by Professor Mahalanobis and a very able group of younger statisticians including R.C. Bose, S.N. Roy and C.R. Rao, the Institute was poised to take on the larger role. **In 1954** Pandit Jawaharlal Nehru, the then Prime Minister of India, entrusted Professor Mahalanobis and ISI with the responsibility of preparing the draft Second Five-Year Plan for the country. The draft submitted by Professor Mahalanobis and the planning models formulated by him and his colleagues have since been regarded as major contributions to economic planning in

India. The formal recognition came in **December 1959**, when the then Prime Minister, Pandit Jawaharlal Nehru piloted the enactment of **the Indian Statistical Institute Act of 1959 in the Parliament**. This Act designated ISI as an **'Institution of National Importance'**. The activities of ISI steadily grew, existing interests became more broad-based and a number of science units were created in the interest of live interaction between Statistics and Natural and Social Sciences. Empowered by the Act to award degrees, the Institute started the B. Stat. and M. Stat. courses. An excellent library was established at Kolkata and the Documentation Research and Training Centre began functioning in Bengaluru. Other developments in infrastructure also began.

The 1950s saw the Institute establishing

- a full-fledged research and training school in Statistics and Probability, with applications in natural and social sciences,
- a planning wing entrusted with the formulation of the Second Five-Year Plan of India,
- the National Sample Survey wing engaged in comprehensive socio-economic data collection for the nation,
- a string of Statistical Quality Control units for promoting the quality movement at various industrial centres of the country,
- a collaboration with the International Statistical Institute to train Government statisticians from Asia and Africa, and
- an Electronic Computer Laboratory that was responsible for developing the first mechanical hand computing machine, the first Analog computer, the first Punched Card storing machine and the first Solid State Computer in India.

In 1961, ISI, in collaboration with Jadavpur University, undertook the design, development and fabrication of a fully transistorized digital computer, called ISI-JU-1, which was commissioned in 1966.

The Institute, from its formative period till present times, was visited by many eminent scientists, some of whom were Nobel Laureates. Besides Ronald A. Fisher, J.B.S. Haldane and Walter A. Shewhart, the luminaries included Frederic and Irene Curie, Neils Bohr, A.N. Kolmogorov, P.M.S. Blackett, J.D. Bernal, Joan Robinson, Genichi Taguchi and George Akerlof. Incidentally, George Akerlof was the 2001 Nobel prize winner in economics and a visiting professor at ISI during 1967-68. During recent times, the visit of Amartya K. Sen, Robert Aumann, Lotfi A. Zadeh, Roger Penrose, Joseph E. Stiglitz, Sir James A. Mirrlees, Eric Maskin, Ei-ichi Negishi, Ada Yonath, David Jonathan Gross and S.R.S. Varadhan (the 2007 Abel Prize winner for his contributions to probability theory and an alumnus of the institute) may be specially mentioned. The Institute is proud to have C.R. Rao, who is among the world leaders in statistical science and is currently in his 100<sup>th</sup> year, in its list of illustrious alumni.

## Post-Mahalanobis period

During 1971-72, two decisions of the Government of India produced serious repercussions on the functioning of the ISI. One was de-linking of the Institute from the Perspective Planning Division of the Planning Commission in 1971, while the other was the separation of National Sample Survey from the ISI and its take-over by the Central Government in 1972. Professor Mahalanobis passed away on 28th June, 1972. It was a critical period for the Institute. To overcome the problems, the ISI sought to strike a judicious balance between the individual academic work on truly fundamental problems and the work that called for a greater engagement with the social and economic problems of the country. The members of the Institute, under the Chairmanship of Shri P.N. Haksar, held a Special General Body Meeting on 26th July, 1974 and amended the Memorandum of Association and the Regulations of the Institute, encouraging more interdisciplinary research and enhancing active participation of the scientists of the ISI in decision-making process of the Institute. The organizational amendments were implemented, with the concurrence of Government of India, in August, 1976. The various research units in natural, social and computer sciences were grouped under a number of scientific Divisions.

Over the decades diversity in research thrusts began to grow manifold, with emphasis on Computer Science and application of Statistics in new areas of research in natural and social sciences. Other Centres, with full-fledged research and teaching programmes,

were gradually created.

The Delhi Centre, initially housed within the Planning Commission premises, was started in 1974, and was shifted to its present campus in 1975.

The Bengaluru Centre was conceived by Professor P.C. Mahalanobis during 1960s. With the Statistical Quality Control unit functioning in Bengaluru from 1956, and Documentation Research and training Centre from 1962, Professor Mahalanobis had thought of starting a centre of ISI around the mid-sixties. However, the activities of the Bengaluru Centre started in September 1978 in a rented building under the Directorship of Professor G. Kallianpur. The various units moved to the present campus in May 1985 and in September 1996, the Bengaluru Centre was formally declared as a Centre of ISI.

The Chennai centre came into existence on 26th July, 2008. A North-East Centre has been established at Tezpur, Assam on 23rd July, 2011. The R.C. Bose Centre for Cryptology and Security at Kolkata was created in 2014 as a national hub for cryptographic requirements.

The Platinum Jubilee of the Institute was observed during 2006-07. At the inaugural ceremony of this event, held on December 24, 2006, Dr. Manmohan Singh, the then Prime Minister of India declared the birth anniversary (29<sup>th</sup> June) of Prof. P.C. Mahalanobis as **National Statistics Day**.

## Academic Programmes

The Institute began offering its internationally-acclaimed undergraduate and postgraduate programmes in Statistics, (B.Stat. and M.Stat.) in 1961, empowered by The Indian Statistical Institute Act of 1959 to award degrees.

This Act was amended by the Parliament of India in 1995 to empower the Institute to award Degrees/Diplomas not only in Statistics, but also in Mathematics, Quantitative Economics, Computer Science and such other subjects related to Statistics as may be determined by the Institute from time to time. Several degree/diploma programmes have been introduced subsequently, namely, M. Tech. in Computer Science, M. Tech. in Quality, Reliability and Operations Research, M.S. in Quantitative Economics, B. Math. and M. Math., M.S. in Library and Information Science, M.S. in Quality Management Science and a few more programmes listed below. ISI also started awarding Ph.D. degrees in the areas of Mathematics, Quantitative Economics, Computer Science as well as Quality, Reliability and Operations Research, in addition to the original discipline, namely, Statistics.

A Post-Graduate Diploma in Statistical Methods and Analytics (PGDSMA) programme has been running successfully at this

centre, with 50% of its seats reserved for candidates domiciled in the North-east. Since 2019, this programme is also being offered simultaneously at the Chennai centre for candidates from all over India.

The Institute has been offering a one-year Postgraduate Diploma in Computer Applications (PGDCA) since the year 2014 at its Giridih Branch while a two-year full-time diploma programme named, Post Graduate Diploma in Business Analytics (PGDBA) is being jointly offered by ISI Kolkata, IIT Kharagpur and IIM Calcutta since 2015.

The International Statistical Education Centre (ISEC), founded in 1950, is operated by the Indian Statistical Institute as an Associate Institution under the supervision of the Government of India. This Centre has been providing training in Statistics to sponsored students mainly from the countries of the Middle East, South and South East Asia, the Far East and the Commonwealth Countries of Africa. The Centre also offers various short-term courses in Statistics.

The DST-funded Centre for Soft Computing Research: A National Facility, which was established in 2005 at ISI Kolkata was also declared an Associate Institution of ISI, in 2010.

## Funding

- The Ministry of Statistics & Programme Implementation, Government of India provides full funding to the Institute. Their support and constant encouragement are among the major factors which helps the Institute to sustain its academic growth and excellence. Funds are provided for
- Plan & Non-Plan budget as per the recommendations of a committee set up for the purpose under Section 8(1) of the “Indian Statistical Institute Act. 1959, No. 57 of 1959” based on the programme of research, teaching, training and various academic activities.
- Grants-in-aid which include the funds required for construction of buildings, hostels, guest house, purchase of equipment, hiring manpower etc.
- Expansion of research and training activities of the Institute by way of opening new Centres in various parts of the country e.g., the Ministry of Statistics & Programme Implementation, Government of India approved the establishment of centres at Delhi, Bengaluru, Chennai, Tezpur at different times, and also the R.C. Bose Centre for Cryptology and Security, as a separate Centre of the Institute, in July 2012;
- Attracting better faculty to ISI, e.g., by improving the pay-scales and service conditions of ISI faculty members through alignment with that of the Indian Institute of Science (IISc), as approved by the Union Cabinet of the Government of India in September 2008.



Secretary MoSPI Interacting with ISI Officials

## Distinguished scientists and statesmen who have served the Institute since inception

### Presidents

1	Sir Rajendra Nath Mookerjee	1932-35
2	Shri E.C. Benthall	1936-37
3	Shri James Reid-Kay	1938
4	Shri Badridas Goenka	1939-41
5	Dr. Nalini Ranjan Sarkar	1942-43
6	Dr. Chintaman D. Deshmukh	1944-63
7	Shri Y.B. Chavan	1964-66
8	Prof. Satyendra Nath Bose	1967-75
9	Shri Subimal Dutt	1976-89
10	Prof. M.G.K. Menon	1990-2012
11	Dr. C. Rangarajan	2012-16
12	Dr. Vijay Kelkar	2016-18
13	Shri Bibek Debroy	2018-till date

### Chairmen

1	Shri B. Rama Rao	1954
2	Shri D.N. Mitra	1955-63
3	Shri K.P.S. Menon	1964-70
4	Shri S.C. Roy	1971
5	Dr. Atma Ram	1972
6	Shri. P.N. Haksar	1973-97
7	Dr. Bimal Jalan	1998-2001
8	Dr. N.R. Madhava Menon	2002-03
9	Shri Pranab Mukherjee	2004-12
10	Shri A.K. Antony	2012-14
11	Dr. Arun Shourie	2014-16
12	Prof. Goverdhan Mehta	2016- 20

### Directors

1	Prof. P.C. Mahalanobis	Dec	1931	-	June	1972
2	Prof. C.R. Rao	July	1972	-	June	1976
3	Prof. G. Kallianpur	July	1976	-	Sept	1978
4	Prof. B.P. Adhikari	Aug	1979	-	Oct	1983
5	Prof. Ashok Maitra	Apri	1984	-	Jan	1987
6	Prof. J.K. Ghosh	Jan	1987	-	Jan	1992
7	Prof. B.L.S. Prakasa Rao	Jun	1992	-	Feb	1995
8	Prof. S.B. Rao	July	1995	-	July	2000
9	Prof. K.B. Sinha	Aug	2000	-	July	2005
10	Prof. S.K. Pal	Aug	2005	-	July	2010
11	Prof. Bimal K. Roy	Aug	2010	-	July	2015
12	Prof. Sanghamitra Bandyopadhyay	Aug	2015	-	till date	

### D.Sc. (Honoris Causa) awardees

Feb 1962	Prof. Satyendra Nath Bose, Prof. Ronald A. Fisher, Pandit Jawaharlal Nehru, Dr. Walter A. Shewhart
Apr 1962	Prof. A.N. Kolmogorov
May 1965	Dr. Chintaman Dwarkanath Deshmukh
Dec 1974	Prof. Raj Chandra Bose, Dr. M.V. Keldysh, Prof. Jerzy Neyman
Feb 1977	Prof. Harald Cramer
Feb 1978	Shri Morarji Desai, Prof. L.V. Kantorovich
Dec 1989	Prof. C.R. Rao
Jan 2001	Prof. Gopinath Kallianpur
Feb 2004	Prof. S.R. Srinivasa Varadhan
Mar 2006	Prof. L.A. Zadeh
Dec 2006	Dr. Manmohan Singh
Feb 2011	Dr. Subhas Mukherjee (Posthumously)
Jan 2013	Prof. K.R. Parthasarathy, Prof. Jayanta Kr. Ghosh, Prof. Pranab Bardhan

# 1.3 Organizational Chart

## Academic Divisions



**Centre for Artificial Intelligence and Machine Learning (CAIML)**

New Centre !

## Associate Institutions

01 Center for Soft Computing Research:  
A National Facility, Kolkata

02 International Statistical Education Centre  
(ISEC), Kolkata

## Computer and Statistical Services Centre (CSSC), Kolkata

## Teaching and Training

01 Dean's Office

02 Placement Cell

## Administrative Services Division

01 Director's Office

Cell for Co-operation with Academia, Industry &  
Research labs (CCAIR)

Faculty Recruitment Cell

PhD/ DSc Cell

ST/SC/OBC Liaison Cell

02 CE (A&F)'s Office

Accounts Section

Audio Visual Unit

Canteen

Cash Unit

Central Stores

Council Section

Despatch Unit

Electrical Maintenance Unit

Engineering Unit

Estate Office

Guest House

Hostels

Human Resource Development Unit

Medical Expenses Reimbursement Unit

Medical Welfare Unit

Personnel Unit

Provident Fund Unit

Public Relations Unit

Printing and Publication Unit

Security Unit

Telephone Unit

Transport Unit

House Building Advance Cell

Internal Audit Cell

Legal Cell

Official Language Cell

Retirement Benefit Cell

RTI, Grievance, Complain Cell

Import/Travel Cell

# 1.4 Campus Locations and Outlying SQC&OR Units

The Institute has its headquarters in Baranagar, Kolkata. It has four subsidiary centres at Delhi, Bengaluru, Chennai and Tezpur, and a branch at Giridih. The R.C. Bose Centre for Cryptology and Security was created in 2014 and is also located in Kolkata. The various locations are shown on a map along with a separate list of units at each campus.

## The Delhi Centre

The Delhi campus is located in a part of South Delhi known as the Qutab Institutional Area. The Centre has three units and a library, namely-

- Economics and Planning Unit (EPU)
- Statistical Quality Control & Operations Research Unit (SQC&ORU)
- Stat-Math Unit (SMU)
- Library

## The Bengaluru Centre, Karnataka

The Bengaluru campus, full of eucalyptus trees, is located on Mysore Road on the outskirts of the city and is close to the Bengaluru University campus. The Centre has six units and a library, namely -

- Applied Statistics Unit (ASU)
- Documentation Research and Training Centre (DRTC)
- Economic Analysis Unit (EAU)
- Statistical Quality Control & Operations Research Unit (SQC&ORU)
- Stat-Math Unit (SMU)
- Systems Science and Informatics Unit (SSIU)
- Library

## The Chennai Centre, Tamil Nadu

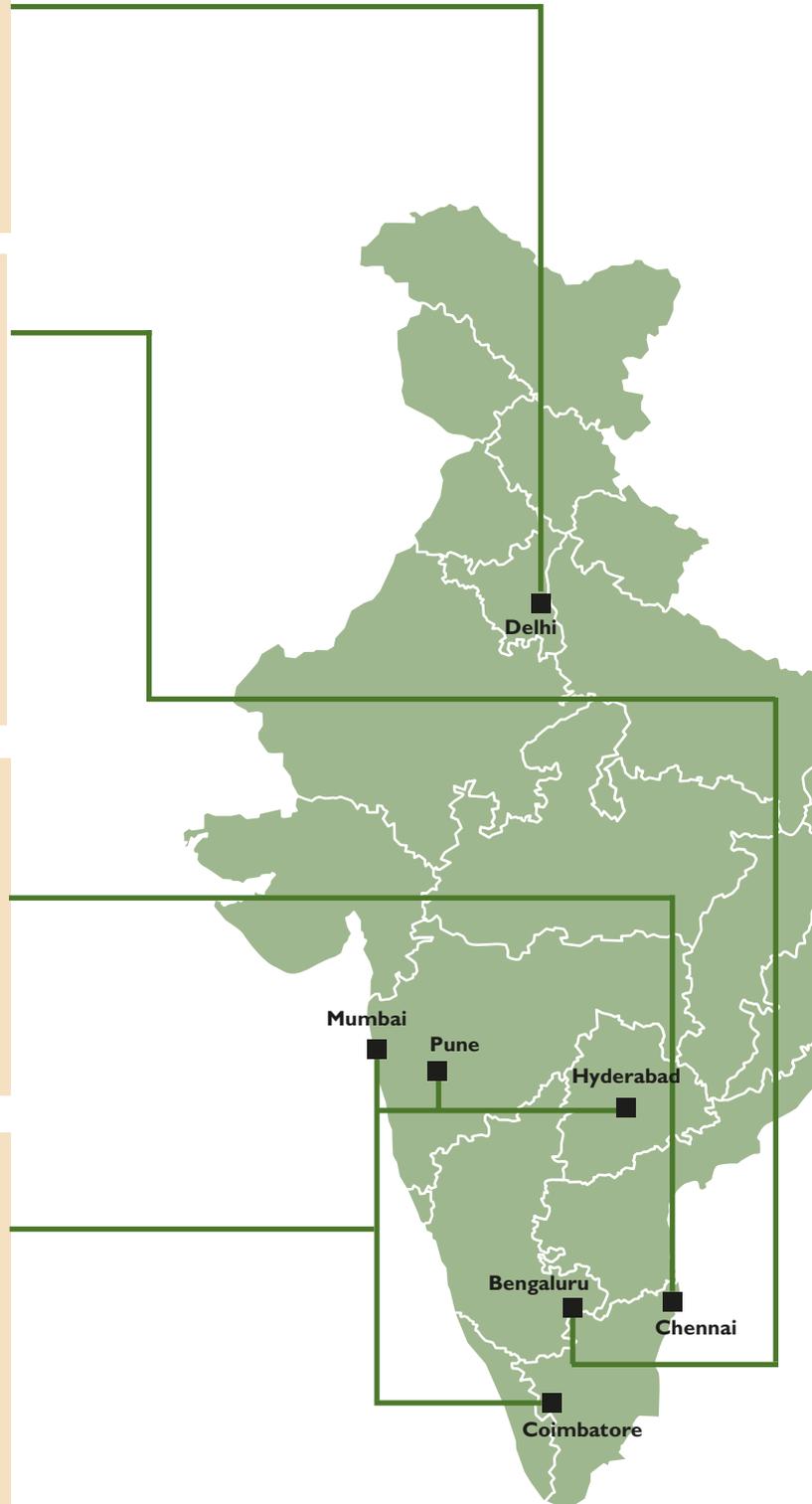
The Chennai centre has moved to the First floor, 37, Nelson Manickam Road, Aminjikarai, Chennai. The Centre has three units and a library, namely -

- Applied Statistics Unit (ASU)
- Computer Science Unit (CSU)
- Statistical Quality Control & Operations Research Unit (SQC&ORU)
- Library

## The SQC & OR Outlying Units

The Institute also has a network of units of Statistical Quality Control & Operations Research (SQC&OR) at Coimbatore, Hyderabad, Mumbai and Pune in addition to those located at its headquarters in Kolkata and other centres in Delhi, Bengaluru and Chennai.

- Coimbatore, Tamil Nadu
- Hyderabad, Telangana
- Mumbai, Maharashtra
- Pune, Maharashtra



## At Kolkata, West Bengal

### Head Quarters of ISI

The main headquarters of the Institute has a lush green sprawling campus in the northern fringe of the Kolkata metropolis. It has 19 academic units, a large and vibrant library, a computer and statistical services centre, two museums and two centres of excellence, namely -

- Advanced Computing and Microelectronics Unit (ACMU)
- Agricultural and Ecological Research Unit (AERU)
- Applied Statistics Unit (ASU)
- Biological Anthropology Unit (BAU)
- Computer Vision and Pattern Recognition Unit (CVPRU)
- Economic Research Unit (ERU)
- Electronics and Communication Sciences Unit (ECSU)
- Geological Studies Unit (GSU) and *the Geology Museum*
- Human Genetics Unit (HGU)
- Interdisciplinary Statistical Research Unit (ISRU)
- Linguistic Research Unit (LRU)
- Machine Intelligence Unit (MIU)
- Physics and Applied Mathematics Unit (PAMU)
- Population Studies Unit (PSU)
- Psychology Research Unit (PRU)
- Sampling and Official Statistics Unit (SOSU)
- Sociological Research Unit (SRU)
- Statistical Quality Control & Operations Research Unit (SQC&ORU)
- Stat-Math Unit (SMU)
- Library and the *PCM Memorial Museum and Archives*
- Centre for Soft Computing Research (CSCR): A National Facility
- Centre for Artificial Intelligence and Machine Learning (CAIML)
- Computer and Statistical Services Centre (CSCC)

### The RC Bose Centre

The R.C. Bose Centre for Cryptology and Security at Kolkata was created as a national hub for cryptographic requirements. This Centre has only one Unit at present.

- Cryptology and Security Research Unit (CSRU)

### The North-East Centre at Tezpur, Assam

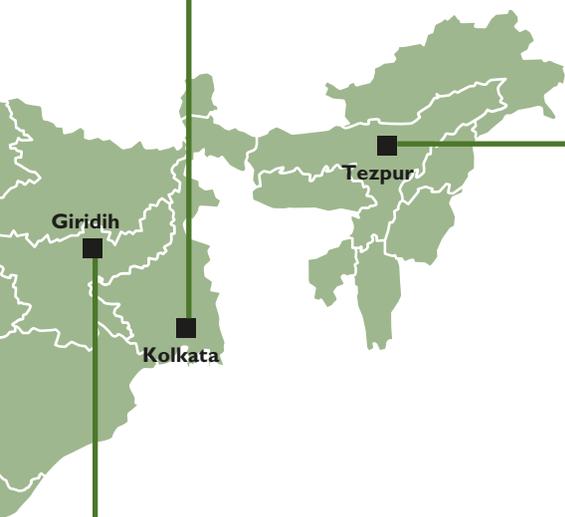
The North-East Centre at Tezpur moved to its permanent campus at Punioni, Solmara this year on June 3, 2019. The present campus is located in the north of Tezpur and is close to Tezpur University, the Defence Research Laboratory (DRL) and the Defence Research & Development Organization (DRDO). The Centre has the following three units and a library-

- Applied and Official Statistics Unit (AOSU)
- Socio-Economic Research Unit (SERU)
- Theoretical and Applied Sciences Unit (TASU)
- Library

### The Giridih Branch, Jharkhand

Situated at the heart of Giridih town, the sprawling campus of the Giridih branch includes three land parcels. Besides the office buildings, Giridih has two large agricultural farms adjacent to the river Ushri. The farms with different land situations (high, mid and low) are ideal for conducting agricultural experiments and has well-equipped laboratories as well. The Giridih branch has two operational units -

- Agricultural & Ecological Research Unit (AERU)
- Sociological Research Unit (SRU)



## 1.5 The Council & Key Committees

### Council

#### President:

**Shri Bibek Debroy** : Chairman, Economic Advisory Council to the Prime Minister (EAC-PM)

#### Chairman:

**Prof. Goverdhan Mehta** : FNA, FRS, Dr. Kallam Anji Reddy Chair School of Chemistry, University of Hyderabad, Hyderabad - 500 046, Telangana

#### Director:

**Prof. Sanghamitra Bandyopadhyay**

### Representatives of the Government of India

**Shri Ali R. Rizvi** : Additional Secretary and Financial Advisor, Government of India, Ministry of Statistics and Programme Implementation, New Delhi

**Shri Tapas Kumar Sanyal** : DG (ES), Government of India, Ministry of Statistics and Programme Implementation, New Delhi

**Shri Pramod Kumar Das** : Additional Secretary, Government of India, Ministry of Finance, Department of Expenditure, New Delhi

**Dr. Praveer Asthana** : Head (AI), Government of India, Ministry of Science and Technology, New Delhi

**Dr. Rajiv Ranjan** : Adviser and Officer-in-Charge, Department of Economic and Policy Research, Reserve Bank of India, Mumbai

**Shri Madan Mohan** : Deputy Director General (HE), Government of India, Ministry of Human Resource Development, New Delhi

### Representative of the ICSSR

**Prof. V.K. Malhotra** : Member-Secretary, Indian Council of Social Science Research, New Delhi

### Representatives of the INSA

**Dr. Manindra Agrawal** : Department of Computer Science, Indian Institute of Technology, Kanpur

**Prof. B.L.S. Prakasa Rao** : Ph. D, FNA, FASc, FNASc., FAPAS, Former Director ISI, INSA Senior Scientist, CR Rao Advance Institute of Mathematics, Statistics and Computer Science, Hyderabad

**Dr. Madhu Dikshit** : THSTI National Chair, NCR Biotech Science Cluster, Faridabad, Haryana

**Prof. Yadati Narahari** : Department of Computer Science and Automation, Indian Institute of Science, Bengaluru

### Representative of the NITI Aayog

**Ms. Anna Roy** : Adviser (DM&A), Government of India, NITI Aayog, New Delhi

## Representative of the University Grants Commission

**Prof. Umesh Singh** : Department of Statistics, Institute of Science, Banaras Hindu University, Varanasi

## Scientists co-opted by the Council

**Prof. Rohini M. Godbole** : FNA, Centre for High Energy Physics, Indian Institute of Science, Bengaluru

**Dr. Ravi P. Singh** : Secretary General of Quality Council of India, an independent organization under  
Department of Industrial Policy and Promotion, Government of India

## Elected representatives of the Institute members not employed in the Institute

**Dr. Shibdas Bandyopadhyay** : Kolkata

**Dr. Aditya Bagchi** : Kolkata

**Dr. I.K. Ravichandra Rao** : Bengaluru

## Elected representatives of the employees of the Institute

**Dr. Partha Pratim Mohanta** : Representative of the Scientific Workers

**Shri Gouri Sankar Acharya** : Representative of the Non-Scientific Workers

## Officers of the Institute

**Prof. B.V. Rajarama Bhat** : Professor-in-Charge, Theoretical Statistics and Mathematics Division

**Prof. Sumitra Purkayastha** : Professor-in-Charge, Applied Statistics Division

**Prof. Susmita Mukhopadhyay** : Professor-in-Charge, Biological Sciences Division

**Prof. E. Somanathan** : Professor-in-Charge, Social Sciences Division

**Prof. Bhabatosh Chanda** : Professor-in-Charge, Computer and Communication Sciences Division

**Prof. Parthasarathi Ghosh** : Professor-in-Charge, Physics and Earth Sciences Division

**Dr. Ashis Kr. Chakraborty** : Head, SQC & OR Division

**Prof. S.K. Neogy** : Head, Delhi Centre

**Prof. C.R.E. Raja** : Head, Bengaluru Centre

**Dr. D. Sampangi Raman** : Acting Head, Chennai Centre

**Prof. Goutam Mukherjee** : Dean of Studies

## Non-Member Secretary

**Brigadier Jagdish Narayan Pandey (Retd)** : Chief Executive (Administration & Finance)

## Academic Council

### Sanghamitra Bandyopadhyay

Director (Chairperson)

### Goutam Mukherjee

Dean of Studies (Convener)

### Applied Statistics Division

Amita Pal

Anup Dewanji

Arijit Chakrabarti

Atanu Biswas

Ayanendranath Basu

Bimal Kr. Roy

Debapriya Sengupta

Debasis Sengupta

Holendra Singh Chungkham

Kishan Chand Gupta

Mausumi Bose

Palash Sarkar

Rita Saha Ray

Smarajit Bose

Subhamoy Maitra

Subir Kumar Bhandari

Sumitra Purkayastha

Sushama M. Bendre

Tapas Samanta

### Biological Sciences Division

Anjana Dewanji

Arunava Goswami

Bidyut Roy

Indranil Mukhopadhyay

Joydev Chattopadhyay

Pabitra Banik

Rabi Ranjan Chattopadhyay

Raghunath Chatterjee

Sabyasachi Bhattacharya

Saurabh Ghosh

Subrata Kr. Roy

Suparna Mandal Biswas

Susmita Mukhopadhyay

### Computer and Communication Sciences Division

Ashish Ghosh

B.S. Daya Sagar

Bhabatosh Chanda

Deba Prasad Mandal

Debrup Chakraborty

Devika P. Madalli

Dipti Prasad Mukherjee

Kausik Kumar Majumdar

Krishnendu Mukhopadhyaya

Kumar Sankar Roy

Nabanita Das

Nikhil Ranjan Pal,

Pradipta Maji

Rajat Kumar De

Sandip Das

Sanghamitra Bandyopadhyay

Srimanta Pal

Subhas Chandra Nandy

Sujata Ghosh

Sushmita Mitra

Susmita Sur-Kolay

Umapada Pal

Utpal Garain

### Physics and Earth Sciences Division

Banasri Basu

Barnana Roy

Chandan Chakraborty

Dhurjati Prasad Sengupta

Dilip Saha

Guruprasad Kar

Parthasarathi Ghosh

Preeti Parashar

Sarbani Patranabis Deb

Santanu Kumar Maity

Saswati Bandyopadhyay

Shiladri Shekhar Das

Subir Ghosh

### Social Sciences Division

Abhiroop Mukhopadhyay

Abhirup Sarkar

Arunava Sen

Chetan Ghate,

Debasis Mishra

Diganta Mukherjee

E. Somanathan

Indraneel Dasgupta

Madhura Swaminathan

Manash Ranjan Gupta

Manipushpak Mitra

Molly Chattopadhyay

Monisankar Bishnu

Niladri Sekhar Dash

Prabal Roy Chowdhury

Samarjit Das

Soumyantra Munshi

Tarun Kabiraj

Tridip Ray

## Statistical Quality Control and Operations Research Division

A. Rajagopal  
 A.L.N. Murthy  
 Abhijit Gupta  
 Amitava Bandyopadhyay  
 Arup Kumar Das  
 Arup Ranjan Mukhopadhyay  
 Ashim Roy Chowdhury  
 Ashis Kr. Chakraborty  
 Ashok Sarkar  
 Biswabrata Pradhan  
 Dipak Kr. Manna  
 E.V. Gijo  
 G.S.R. Murthy  
 Kalyan Kumar Chowdhury  
 Md. Zafar Anis  
 Nandini Das  
 Prasun Das  
 Ranjan Sett  
 Rina Chakravorty  
 Samir Kr. Neogy  
 Sanjit Ray  
 Surajit Pal

Susanta Kr. Gauri  
 U. Haridas Acharya

## Theoretical Statistics and Mathematics Division

Abhay Gopal Bhatt  
 Amartya Kumar Dutta  
 Anil Kumar Ghosh  
 Anish Sarkar  
 Antar Bandyopadhyay  
 Arup Bose  
 Arup Kumar Pal  
 B. Rajeev  
 B. Sury  
 B.V. Rajarama Bhat  
 C. Robinson Edward Raja  
 Debashish Goswami  
 Deepayan Sarkar  
 Gopal Krishna Basak  
 Goutam Mukherjee  
 Isha (Bagai) Dewan  
 Jaydeb Sarkar  
 Mahuya Datta  
 Mohana Delampady  
 Mrinal Kanti Das

Paramita Das  
 Partha Sarathi Chakraborty  
 Pradipta Bandyopadhyay  
 Probal Chaudhuri  
 Rahul Roy  
 Ritabrata Munshi  
 Rudra Pada Sarkar  
 Siva Athreya  
 Sunanda Bagchi  
 Swagato Kumar Ray  
 V.R. Padmawar

## Computer and Statistical Service Centre

Amitava Datta  
 Debashis Roy

## Library, Documentation and Information Sciences Division

Kishor Chandra Satpathy

## Member-Secretary, International Statistical Education Center

Ayanendranath Basu

## Finance Committee

### Director

(Chairperson)

### Government Representative

(MOS&PI)

### Government Representative

(Ministry of Finance)

### Prof. Abhirup Sarkar

ISI, Kolkata

### Prof. Dilip Saha,

ISI, Kolkata

### Prof. Nikhil R. Pal,

ISI, Kolkata

### Prof. Pabitra Banik

ISI, Kolkata

### Prof. Chetan Ghate

ISI, Delhi

### Dr. Prasun Das

ISI, Kolkata

### Head, Delhi Centre

### Head, Bengaluru Centre

### Head, Chennai Centre

### Dr. Partha P. Mohanta

### Shri Samar Ray

(Former PS, Finance Dept., Govt. of WB)

**Former Dy.** Comptroller and Auditor General, Govt. of India (External Expert)

### Chief Executive (A&F)

### Shri Sudip K. Chakraborty

(Convener)

## Works Advisory Committees

### Bengaluru

**Prof. K. S. Nanjunda Rao**  
(Chairperson)

**Dr. B.K. Keshavan**  
External Expert (Electrical Engineering)

**Dr. S. V. Venkatesh**  
External Expert (Civil Engineering)

**Head, ISI, Bengaluru Centre**

**Head, Stat-Math Unit, ISI, Bengaluru or his/her nominee**

**Head, DRTC, ISI, Bengaluru or his/her nominee**

**Head, SQC & OR Unit, ISI, Bengaluru or his/her nominee**

**Head, E.A.U., ISI, Bengaluru or his/her nominee**

**Head, SSIU, ISI, Bengaluru or his/her nominee**

**Ms. N. Sarvamangala**  
Accounts Officer, Bengaluru Centre

**Sr. Administrative Officer**  
ISI, Bengaluru (Convener)

### Delhi

**Prof. B. Bhattacharjee**  
Civil Engineering Department, IIT Delhi  
(Chairman)

**Head, ISI Delhi**

**Mr. G. K. Taneja**  
Institute Engineer, IIT Delhi– Expert  
(Electrical)

**Mr. R. Upadhyay**  
Executive Engineer (Civil),

**Shri Lal Bahadur**  
Sanskrit Vidyapeeth - Expert (Civil)

**Mr. Madhav Naik**  
(Architect)

**Prof. Anish Sarkar**  
ISI Delhi

**Prof S. K. Neogy**  
ISI Delhi

**Prof. Moni Shankar Bishnu**  
ISI Delhi

**Mr. Parama Gogoi**  
ISI Delhi

**Mr. Pratyush Banerjee**  
DCE (A), ISI Delhi (Convener)

### Kolkata

**Prof. Anandapran Gupta**  
(Chairperson)

**Prof. Rajat K. De**  
(Vice-Chairperson)

**Prof. Rajkumar Roychowdhury**

**Prof. Smarajit Bose**

**Prof. Indranil Dasgupta**

**Dr. Ashis K. Chakraborty**

**Dr. Bhaskar Sengupta**  
[Expert (Civil)]

**Prof. Siddhartha Datta**  
[Expert (Architecture)]

**Shri Asim Sinha**  
[Expert (Electrical)]

**Chief Executive**  
(A&F)

**Dr. Partha P. Mohanta**

**Shri Amitava Mukherjee**

**In-Charge, EMU**

**In-Charge, Engg. Unit (Convener)**

## Ph.D. / D.Sc. Committees

### Computer Science

**Director**  
(Chairperson)

**Dean of Studies**

**Subhas C. Nandy**

**Susmita Sur-Kolay**

**Mandar Mitra**

**Bhabatosh Chanda**

**Nikhil R. Pal**

**Sushmita Mitra**

**Subhamoy Maitra**

**Pradipta Maji**

**Utpal Garain (Convener)**

### Mathematics

**Director or his/her nominee**  
(Chairperson)

**Dean of Studies or his/her nominee**

**B. Sury**

**Siva Athreya**

**Swagato K. Ray**

**Mrinal Kanti Das**

**Banasri Basu**

**Debashish Goswami**

**Parthasarathi Chakraborty**

**Arup K. Pal (Convener)**

### Quantitative Economics

**Director**  
(Chairperson)

**Dean of Studies**

**Indraneel Dasgupta**

**Manipushpak Mitra**

**Prabal Roy Chowdhury**

**Madhura Swaminathan**

**Debasis Mishra**

**Abhiroop Mukhopadhyay**

**Tarun Kabiraj (Convener)**

## Statistical Quality Control and Operations Research

**Director**  
(Chairperson)

**Dean of Studies**

**Mohan Delampady**

**Subir Bhandari**

**Utpal Garain**

**Smarajit Bose**

**E.V.Gijo**

**Ashis K.Chakraborty**

**S.K.Neogy**

**Arup K. Das (Convener)**

## Statistics

**Director**  
(Chairperson)

**Dean of Studies**

**Mausumi Bose**

**Gopal K. Basak**

**Mohan Delampady**

**V. Padmawar**

**Isha Dewan**

**Abhay G. Bhatt**

**Ayanendranath Basu**

**Tapas Samanta**

**Anil K. Ghosh**

**Atanu Biswas (Convener)**

## Policy Planning and Evaluation Committee (PPEC)

**Chairman of ISI Council**  
(Chairperson)

**Director**  
(Vice-Chairperson)

**Director General, CSO**

**Financial Advisor, MOS & PI**

**Prof. Kalyan B. Sinha**  
Former Director, ISI

**Prof. B.L.S. Prakasa Rao**  
Former Director, ISI

**Prof. Partha P. Majumder, ISI**

**Prof. Partha P. Chakraborty**  
Director, IIT Kharagpur

**Prof. Ahay G. Bhatt**  
ISI, Delhi

**Prof. Mohan Delampady**  
ISI Bengaluru

**Prof. Dhrubojyoti Chattopadhyay**  
Former Pro-VC (Acad.) Calcutta University  
VC Amity University

**Prof. Dipti P. Mukherjee**  
ISI (Convener)

## Technical Advisory Committees (TAC)

### Applied Statistics Division

**Director**  
ISI (Chairperson)

**Prof. S.P. Mukherjee**

**Prof. Rahul Mukherjee**

**Prof. Debasis Kundu**

**Prof. Kalyan Das**

**Professor-in-Charge**  
Applied Statistics Division (Convener)

### Biological Sciences Division

**Director**  
(ISI) Chairperson

**Prof. Nitai P. Bhattacharyya**

**Prof. Himanshu Pathak**

**Dr. Giriraj Chandak**

**Dr. A.R. Sharma**

**Prof. Gautam Kshatriya**

**Prof. Aditya Chatterjee**

**Professor-in-Charge**  
Biological Sciences Division (Convener)

### Computer and Communication Sciences Division

**Director, ISI (Chairperson)**

**Prof. Partha P. Chakrabarti**

**Prof. Naveen Garg**

**Prof. P. Nagabhushan**

**Prof. Santanu Chaudhury**

**Dr. Pijushkanti Panigrahi**

**Prof. Pallab Dasgupta**

**Prof. Chiranjib Bhattacharyya**

**Professor-in-Charge**  
Computer & Communication Sciences  
Division(Convener)

### Library, Documentation and Information Sciences Division

**Director**  
ISI (Chairperson)

**Dr. M. Paul Pandian**

**Dr. G. Mahesh**

**Dr. P.R. Goswami**

**Prof. Sachindra Nath Bhattacharya**

**Kishor Chandra Satpathy**  
Chief Librarian (Convener)

### Physics and Earth Sciences Division

**Director**  
ISI (Chairperson)

**Prof. Ashok Sahni**  
**Prof. Narayan Banerjee**  
**Prof. Suman Chakraborty**

**Prof. Santanu Banerjee**

**Prof. N.V. Chalpati Rao**  
**Professor-in-Charge**  
Physics & Earth Sciences Division  
(Convener)

### Social Sciences Division

**Director**  
ISI (Chairperson)

**Prof. Achla Raina**  
**Prof. Rajni Palriwala**

**Prof. Saikat Roy**  
**Prof Anindya Sen**  
**Professor Arvind Pandey**  
**Prof. K.S. James**  
**Prof. Tista Bagchi**  
**Professor-in-Charge**  
Social Sciences Division (Convener)

### Statistical Quality Control and Operations Research Division

**Director, ISI (Chairperson)**  
**Professor Ramanuj Majumdar**  
**Prof. Debasis Kundu**  
**Prof. Manoj Tiwari**  
**Dr. O.P. Mall**  
**Head, SQC & OR Division (Convener)**

### Theoretical Statistics and Mathematics Division

**Director**  
ISI (Chairperson)  
**Prof. V. Balaji**  
**Prof. Indranil Biswas**  
**Prof. Tathagata Bandyopadhyay**  
**Prof. B.L.S. Prakasa Rao**  
**Prof. V.S. Borkar**  
**Professor-in-Charge, Statistics & Mathematics Division (Convener)**



Council meeting in progress

# 02

## TEACHING AND TRAINING

### Dean of Studies (during 2019-20)

Prof. Goutam Mukherjee, SMU Kolkata

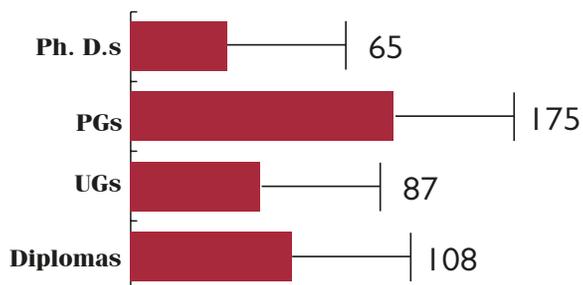
### Office of the Dean of Studies

S.N. Bose Bhawan, 5th floor, ISI, 203 B. T. Road, Kolkata-700108

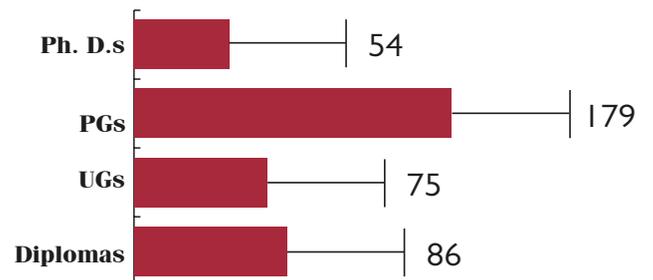
No of scientific staff: 2

No of non-scientific staff: 12

### Admissions Across Programmes



### Human Resources Generated



### International Courses

#### Admissions



9

Students



15

Countries

#### Diplomas Awarded



14

Students



11

Countries

ISI, a premier institute in India, is renowned worldwide for its first holistic degree programmes in Statistics (both UG and PG), introduced by its founder, Prof. P.C. Mahalanobis.

## 2.1 Programmes offered

The following academic programmes were offered during the academic session 2019-2020:

### Undergraduate Programmes (three-year)

Bachelor of Statistics - B. Stat. (Hons.)

Kolkata

Bachelor of Mathematics - B. Math. (Hons.)

Bengaluru

### Postgraduate Programmes (two-year)

Master of Statistics - M. Stat.

Delhi & Kolkata

Master of Mathematics - M. Math. (Bengaluru/Kolkata, alternate years)

Bengaluru

Master of Science (M.S.) in Quantitative Economics - MSQE

Delhi & Kolkata

Master of Science (M.S.) in Quality Management Science - MSQMS

Bengaluru - Hyderabad

Master of Science (M.S.) in Library and Information Science - MSLIS

Bengaluru

M. Tech. in Computer Science (CS)

Kolkata

M. Tech. in Cryptology and Security (CrS)

Kolkata

M. Tech. in Quality, Reliability and Operations Research (QROR)

Kolkata

### Postgraduate Diploma Programmes (two-year)

Post Graduate Diploma in Business Analytics (PGDBA)

Kolkata

Jointly conducted by IIM Calcutta, IIT Kharagpur and ISI Kolkata

### Postgraduate Diploma Programmes (one-year)

Post Graduate Diploma in Statistical Methods and Analytics (PGDSMA)

Chennai and North-East Centre, Tezpur

Post Graduate Diploma in Computer Applications (PGDCA)

Giridih

### Doctoral Programmes

Research Fellowships and degrees awarded by ISI in Statistics, Mathematics, Quantitative Economics, Computer Science, Quality, Reliability and Operations Research

Research Fellowships awarded by ISI and degrees awarded by other academic bodies in areas including Biological Sciences, Geology, Library & Information Science and Physics.

Bengaluru, Chennai, Delhi, Giridih, Hyderabad & Kolkata

Research Fellowships awarded by government bodies (e.g. CSIR, DST, INSPIRE, NBHM, UGC) and degrees awarded by ISI/other academic bodies.

### Short-term Training Programmes (4 weeks-6 months)

This training is provided to UG/PG students from other reputed Universities/Institutions as part of their curriculum requirements/for enhancement of knowledge and application skills, under the guidance of faculty members of the Institute.

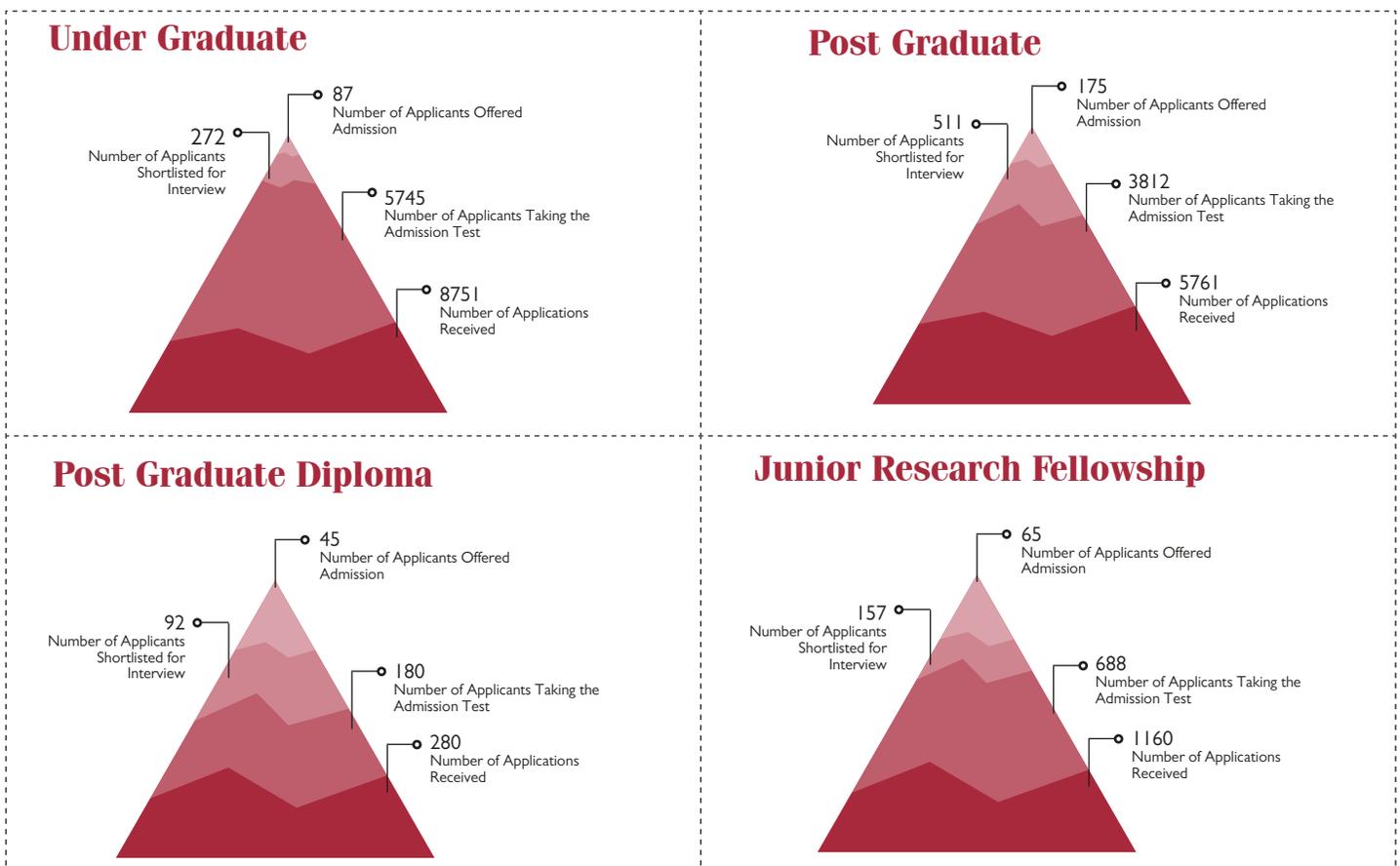
## 2.2 Admissions (2019-2020)

### Degree, Diploma and Ph.D. Programmes

All logistic issues related to the conduct of the regular academic programmes offered by ISI, from admissions to the award of final degrees, are handled by the office of the Dean of Studies.

An all-India entrance examination for all programmes (except PGDBA), is conducted annually by the Dean's Office in May, typically on the second Sunday of the month. The ISI Admission Test for the Academic session 2019-20 was conducted on Sunday, May 05, 2019, at 38 centres all over India.

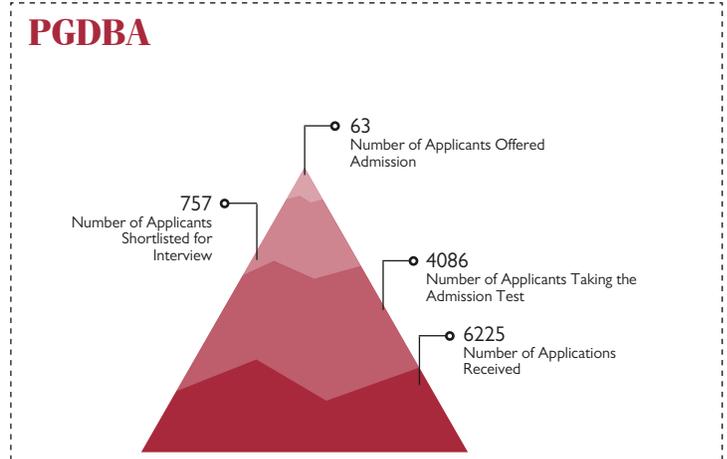
### The Selection Process



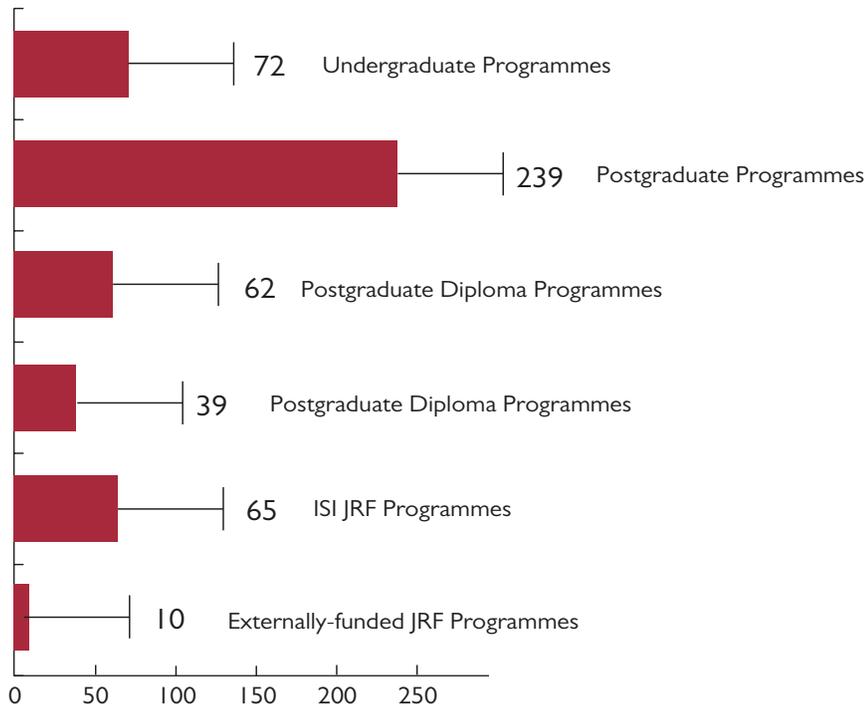
### PGDBA

The two-year Post Graduate Diploma in Business Analytics (PGDBA) programme, jointly offered by IIM Calcutta, IIT Kharagpur and ISI, Kolkata, aims to deliver a cutting-edge interdisciplinary educational experience to graduates aspiring to build a career in the rapidly expanding field of business analytics. The first semester of this programme is conducted every year in ISI.

The selection and admission process for the programme is carried out by the three institutes on a rotation basis. For the 2019-20 session, it was conducted by IIT Kharagpur.



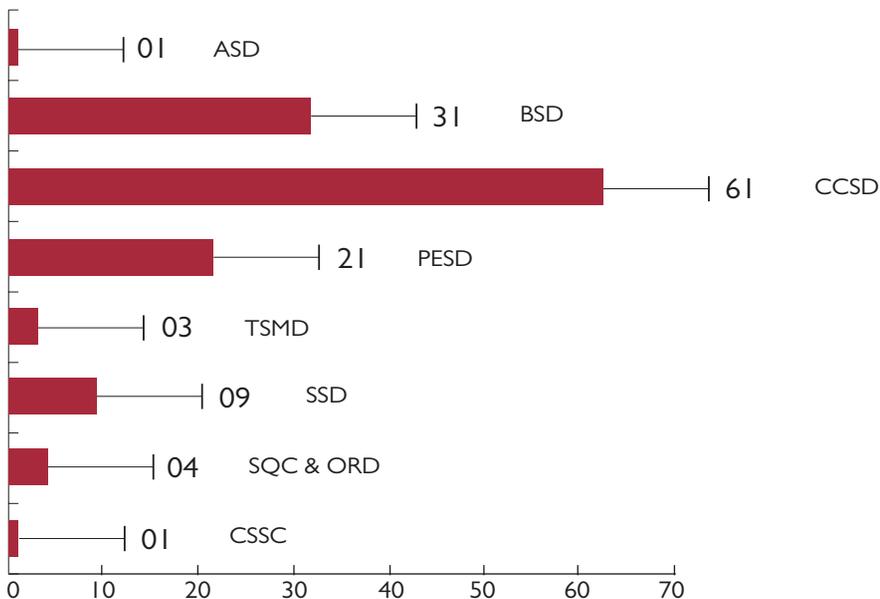
## Enrollment in Degree-Diploma programmes



## Short term training program

**131**

students from different Universities/Academic Institutions received training under the guidance of faculty members from the different Divisions in Kolkata.



## 2.3 Graduating Students (2019-2020)

### Data on graduating students

PROGRAMME	Number Graduating
<b>Undergraduate Programmes (three-year)</b>	<b>75</b>
Bachelor of Statistics - B. Stat. (Hons.)	45
Bachelor of Mathematics - B. Math. (Hons.)	28
Bachelor of Mathematics - B. Math.	2
<b>Postgraduate Programmes (two-year)</b>	<b>179</b>
Master of Statistics - M. Stat.	37
Master of Mathematics - M. Math.	21
Master of Science (M.S.) in Quantitative Economics - MSQE	42
Master of Science (M.S.) in Quality Management Science - MSQMS	13
Master of Science (M.S.) in Library and Information Science - MSLIS	15
M. Tech. in Computer Science (CS)	29
M. Tech. in Quality, Reliability and Operations Research (QROR)	22
<b>Postgraduate Diploma Programmes (two-year)</b>	<b>52</b>
Post Graduate Diploma in Business Analytics (PGDBA)	52
<b>Postgraduate Diploma Programmes (one-year)</b>	<b>34</b>
Post Graduate Diploma in Statistical Methods and Analytics (PGDSMA)	24
Post Graduate Diploma in Computer Applications (PGDCA)	10
<b>Ph.D. Degrees</b>	<b>38</b>
Mathematics	8
Statistics	5
Computer Science	14
Economics	3
Geology	4
Linguistics	1
Biological Science	3
<b>Externally-funded Ph.D. Degrees</b>	<b>16</b>
Mathematics	1
Computer Science	10
Biological Science	2
Library and Information Science	3

## Recipients of Prizes

In the 54th Convocation of the Indian Statistical Institute held on 23rd January, 2020, students were recipients of various medals and prizes in recognition of their outstanding performance for the session ending 2019, under the following programmes'

### UNDER GRADUATE

**B.Stat.**



**Supravat Sarkar**

ISIAA – Mrs. M. R. Iyer Memorial Gold Medal for outstanding overall performance

**B.Stat.**



**Supravat Sarkar**

D. Basu Memorial Gold Medal for outstanding performance



**Subhrajyoty Roy**

**B.Stat.**



**Subhrajyoty Roy**

Nikhilesh Bhattacharya Memorial Gold Medal for best performance in Statistics

**B.Stat.**



**Debolina Paul**

Usri Gangopadhyay Memorial Medal for the best female student

**B.Stat.**



**Aadrita Laha**

Mukul Chaudhuri Cash Award for the best female student in the first year

**B.Stat.**



**Archi De**

Mukul Chaudhuri Cash Award for the best female student in the second year

**B.Math.**



**Deepak Badarinath**

S. H. Aravind Gold Medal for outstanding performance



## POSTGRADUATE

**M.Stat.****Sagnik Nandy**

P. C. Mahalanobis Memorial  
Gold Medal for outstanding  
performance

**M.Stat.****Sagnik Nandy**

ISIAA – J. K. Ghosh Memorial Gold Medal for  
outstanding performance

**Apratim Dey****M.Math.****Tejaswi Tripathi**

ISIAA – P. C. Panesar Memorial  
Gold Medal for outstanding overall  
performance

**M.Stat.****Debraj Bose****Soumik Purkayastha****Partha Sarkar**

Sabyasachi Roy Memorial Gold Medal for doing the best project work in second year

**MS(QE)****Amrita Dutta**

Dr. N. S. Iyenger Award  
for best student of  
Econometrics

**MS(QE)****Amol**

Sanghamitra Das Memorial  
Gold Medal for outstanding  
overall performance

**M.Tech. (QROR)****Souvik Masanta**

ISIAA – Mrs. M. R. Iyer Memorial  
Gold Medal for outstanding  
overall performance

**M.Tech.(CS)****Shayak Chakraborty**

ISIAA – Rashi Ray Memorial  
Medal for outstanding overall  
performance

**M.Tech.(CS)****Soumya Kanti Das**

Sunity Kumar Pal Memorial  
Gold Medal for best  
dissertation

**M.Tech.(CS)****Sreyosi Bhattacharyya**

Cash Prize for doing the best  
dissertation (Application/  
System) (2016-2018)

PGDBA



**Mayank More**

Gold Plaque to the First Rank Holder



**Mayank More**  
First Rank



**Puneet Vashisht**  
Second Rank



**Ankita Jha**  
Third Rank

Cash Prizes for Recognising outstanding academic performances



## Ph.D degrees awarded by ISI

In the convocation held on 23rd January, 2020, 30 students were conferred PhD degrees having successfully completed their requirements for the award of PhD degree.

SI No.	Name of the Scholar	Name(s) of the Supervisor(s)	Title of the Thesis	Area
1	<b>Avijit Maji</b> M.Sc (Statistics) (I.I.T. Kanpur)	Prof. Ayanendranath Basu, ISRU, ISI, Kolkata	Some Contributions to Robust Inference based on Statistical Distances	Statistics
2	<b>Joydeep Chowdhury</b> Master of Statistics (Indian Statistical Institute)	Prof. Probal Chaudhuri, SMU, ISI, Kolkata	Nonparametric Regression and ANOVA in Infinite Dimensional Spaces	Statistics
3	<b>Adhidev Biswas</b> Master of Statistics (Indian Statistical Institute)	Prof. Ayanendranath Basu, ISRU, ISI, Kolkata	A New Weighted Likelihood Approach and Its Application to Various Statistical Scenarios	Statistics
4	<b>Tamalika Koley</b> Master of Statistics (Indian Statistical Institute)	Prof. Anup Dewanji, ASU, ISI, Kolkata	Current Status Data with Competing Risks and Missing Failure Types	Statistics
5	<b>Jayabrata Biswas</b> Master of Statistics (Indian Statistical Institute)	Dr. Kiranmoy Das, ISRU, ISI, Kolkata	Bayesian Linear Mixed Models for Analyzing Semi-Continuous Longitudinal Outcomes	Statistics
6	<b>B. Madhav Reddy</b> M. Sc. (Mathematics) (University of Hyderabad)	Dr. Shamindra Kumar Ghosh, SMU, ISI, Kolkata	On free-type rigid $C^*$ -tensor categories and their annular representations	Mathematics
7	<b>Muthukumar P</b> M.Sc. (Mathematics) (I.I.T. Madras)	Prof. S. Ponnusamy, SMU, ISI, Chennai	A study of operators on the discrete analogue of Hardy spaces on homogeneous trees and on other structures	Mathematics
8	<b>Subham Sarkar</b> M.Sc (Mathematics) (Ramakrishna Mission Vivekananda University)	Dr. Ramesh Sreekantan, SMU, ISI, Bengaluru	Higher Chow Cycles on the Jacobian of curves	Mathematics
9	<b>Tiju Cherian John</b> M.Sc (Mathematics) (TIFR)	Prof. B.V. Rajarama Bhat, SMU, ISI, Bengaluru	Infinite Mode Quantum Gaussian States	Mathematics
10	<b>Soumi Tikader</b> M.Sc (Mathematics) (Jadavpur University)	Prof. Mrinal Kanti Das, SMU, ISI, Kolkata	Orbit spaces of unimodular rows over smooth real affine algebras	Mathematics
11	<b>Muna Naik</b> M.Sc. (Mathematics) (Homi Bhabha National Institute)	Prof. Rudra Pada Sarkar, SMU, ISI, Kolkata	Characterization of eigen functions of the Laplace-Beltrami operator through radial averages on rank one symmetric spaces	Mathematics
12	<b>Nikhilesh Dasgupta</b> Master of Mathematics (Indian Statistical Institute)	Dr. Neena Gupta, SMU, ISI, Kolkata	Studies on polynomial rings through locally nilpotent derivations	Mathematics
13	<b>Saurabh Singh</b> M.Sc. (Mathematics) (University of Hyderabad)	Dr. Suresh Nayak, SMU, ISI, Bengaluru	Some Topics involving Derived Categories over Noetherian Formal Schemes	Mathematics
14	<b>Arindam Paul</b> M.Sc. (Economics) (University of Calcutta)	Prof. Manipushpak Mitra, ERU, ISI, Kolkata	Price vs. Quantity: Essays on Strategic Choice in Differentiated Oligopoly	Quantitative Economics
15	<b>Chayanika Mitra</b> M.A (Economics) (Jadavpur University)	Prof. Amita Majumder, ERU, ISI, Kolkata	Gender Bias in Education in West Bengal	Quantitative Economics

SI No.	Name of the Scholar	Name(s) of the Supervisor(s)	Title of the Thesis	Area
16	<b>Sargam Gupta</b> M.A. (Economics) (Jawaharlal Nehru University)	Prof. Chetan Ghate, EPU, ISI, Delhi	Essays in Monetary Policy for Emerging Market Economies	Quantitative Economics
17	<b>Sravan Danda</b> Master of Statistics (Indian Statistical Institute)	Prof. B.S. Daya Sagar, SSIU, ISI, Bengaluru & Prof. Laurent Najman, ESIEE (University Paris-EST)	Some Applications of the Power Watershed Framework to Image Segmentation and Image Filtering	Computer Science
18	<b>Aditya Challa</b> M.Sc. (Complex Systems Science) (University of Warwick)	Prof. B.S. Daya Sagar, SSIU, ISI, Bengaluru & Prof. Laurent Najman, ESIEE (University Paris-EST)	Some Studies on Mathematical Morphology for Unsupervised and Semi-Supervised Learning	Computer Science
19	<b>Shounak Datta</b> M.E (Electronics & Tele-com. Engg.) (Jadavpur University)	Dr. Swagatam Das, ECSU, ISI, Kolkata	On the Design of Learning Systems with Resilience to Data Irregularities	Computer Science
20	<b>Angshuman Paul</b> M.E (Electronics & Tele-com. Engg.) (Jadavpur University)	Prof. Dipti Prasad Mukherjee, ECSU, ISI, Kolkata	On Building a Beautiful Random Forest	Computer Science
21	<b>Yusuf Akhtar</b> M.Tech. (Visual Information and Embedded Systems) (I.I.T. Kharagpur)	Prof. Dipti Prasad Mukherjee, ECSU, ISI, Kolkata	Detection of Architectural Distortion in a Digitized Mammogram	Computer Science
22	<b>Soumi Chattopadhyay</b> M.Tech (Computer Science) (Indian Statistical Institute)	Dr. Ansuman Banerjee, ACMU, ISI, Kolkata	Scalable Algorithms for Web Service Composition and Recommendation	Computer Science
23	<b>Sameer Desai</b> BS-MS Dual Degree (Mathematical Sciences) (IISER, Kolkata)	Dr. Arijit Bishnu & Dr. Arijit Ghosh, ACMU, ISI, Kolkata	Geometric Packing, Covering and Uniformity	Computer Science
24	<b>Ankush Acharyya</b> M.E. (Software Engineering) (Jadavpur University)	Prof. Subhas Chandra Nandy, ACMU, ISI, Kolkata	Facility Location Problems in Colored Setup	Computer Science
25	<b>Abhisek Chakrabarty</b> M.E. (Information Technology) (BESU, Shibpur)	Prof. Utpal Garain, CVPRU, ISI, Kolkata	On Lemmatization and Morphological Tagging for Highly Inflected Indic Languages	Computer Science
26	<b>Dwaipayan Roy</b> Master of Computer Application (Jadavpur University)	Dr. Mandar Mitra, CVPRU, ISI, Kolkata & Dr. Debasis Ganguly, IBM Research, Dublin	World Embeddings and Information retrieval	Computer Science
27	<b>Sreevani</b> M.Tech. (Computer Science) (Indian Statistical Institute)	Prof. C.A.Murthy, MIU, ISI, Kolkata & Prof. Bhabatosh Chanda, ECSU, ISI, Kolkata	On Dimensionality Reduction and Kernel Density Estimation for Pattern Recognition	Computer Science
28	<b>Ritam Bhaumik</b> Master of Statistics (Indian Statistical Institute)	Dr. Mridul Nandi, ASU, ISI, Kolkata	Design and Provable Security Analysis of Symmetric Key Modes	Computer Science
29	<b>Anabik Pal</b> M.E. (Software Engineering) (Jadavpur University)	Prof. Utpal Garain, CVPRU, ISI, Kolkata	MacPso: Machine assisted analysis of Psoriatic skin	Computer Science
30	<b>Angana Chakraborty</b> M.Sc. (Computer & Information Science) (University of Calcutta)	Prof. Sanghamitra Bandyopadhyay, MIU, ISI, Kolkata	Algorithms for Sequence Similarity Search: From Alignment-based to Alignment-free Approaches	Computer Science

## Ph.D. degrees awarded to ISI Research Fellows by other Academic bodies

### A. Research Fellows who have been awarded Ph. D degree by Academic Bodies other than ISI for work done in ISI with ISI-fellowship.

SI No.	Name of the Scholar	Name(s) of the Supervisor(s)	Title of the Thesis	Department	University
1	<b>Atul Aman</b>	Dr. Niladri Sekhar Dash, LRU, ISI, Kolkata and Dr. Jayashree Chakraborty, Dept. of Humanities and Social Sciences, IIT Kharagpur	A Speech-Corpus-Based Phonetic Reader of Khortha	Humanities and Social Sciences	Indian Institute of Technology, Kharagpur
2	<b>Sanghita Dasgupta</b>	Prof. Partha Sarathi Ghosh, GSU, ISI, Kolkata	Sedimentologic And Palaeoclimatic Studies on the Late Triassic Maleri Formation, Northwestern Pranhita-Godavari Basin, India.	Geology	University of Calcutta
3	<b>Richa Singh</b>	Prof. Bidyut Roy, HGU, ISI, Kolkata	Transcriptome From Oral Cancer Tissues: A Source to Identify Signatures of The Disease.	Biochemistry	University of Calcutta
4	<b>Biswanath Malakar</b>	Prof. Subrata Kr. Roy, BAU, ISI, Kolkata	Health Status of the Stone Mine Workers of Birbhum district, West Bengal	Anthropology	University of Calcutta
5	<b>Poulami Jha</b>	Prof. Anjana Dewanji, AERU, ISI, Kolkata	Sustainable Management Alternatives for an Invasive Plant, <i>Alternanthera philoxeroides</i>	Environmental Science	University of Calcutta
6	<b>Saradee Sengupta</b>	Prof. Saswati Bandyopadhyay, GSU, ISI, Kolkata	Osteology, Phylogeny and Palaeobiology of a New Middle Triassic Horned Archosauromorpha from the Denwa Formation, Satpura Gondwana Basin, India.	Geology	University of Calcutta
7	<b>Arnab Sain</b>	Prof. Dilip Saha, GSU, ISI, Kolkata	Granitic Plutons From Around Kanigiri, Prakasam, District, Southern India, and Their Deformation In Relation to Tectonic Evolution of the Nellore Schist Belt.	Geology	University of Calcutta
8	<b>Suchana Taral</b>	Dr. Tapan Chakraborty, GSU, ISI, Kolkata	Sedimentology of the Siwalik Group in the Tista Valley and Kameng River Section, Eastern Himalaya: Depositional Systems, Palaeogeography and Palaeoclimate	Geology	University of Calcutta

### B. Research Fellows/Personnel who have been awarded Ph. D degree by Academic Bodies other than ISI for work done in ISI.

SI No.	Name of the Scholar	Name(s) of the Supervisor(s)	Title of the Thesis	Department	University
1	<b>Aditi Chandra</b>	Dr. Raghunath Chatterjee, HGU, ISI, Kolkata	To Identify Genetic and Epigenetic Associations with Psoriasis	Biochemistry	University of Calcutta
2	<b>Kaustuv Nag</b>	Prof. Nikhil Ranjan Pal (Co-supervisor), ECSU, ISI, Kolkata	Multiobjective Evolutionary Approaches to Pattern Classification and Robust Optimization	Instrumentation & Electronics Engineering	Jadavpur University
3	<b>Rwitam Jana</b>	Dr. Arup Kumar Das, SQC & OR, ISI, Kolkata and Dr. Sagnik Sinha, Mathematics Department, Jadavpur University	A contribution to the solution approaches in optimization theory	Mathematics	Jadavpur University
4	<b>Moumita Das</b>	Dr. Ansuman Banerjee, ACMU, ISI, Kolkata and Dr. Bhaskar Sardar, Department of Information Technology, Jadavpur University	Branch Predictor design for low resource architectures	Information Technology	Jadavpur University

SI No.	Name of the Scholar	Name(s) of the Supervisor(s)	Title of the Thesis	Department	University
5	<b>Babul Prasad Tewari</b>	Dr. Sasthi Charan Ghosh, ACMU, ISI, Kolkata	Efficient Frequency Assignment and Association Control in IEEE 802.11 WLAN	Computer Science & Engineering	University of Calcutta
6	<b>H. M. Rajashekara</b>	Prof. B.S. Daya Sagar, SSIU, ISI, Bengaluru	Design and Development of a Computational Framework for Spatio-Temporal Model	Computer Applications	Bharathiar University, Coimbatore, Tamil Nadu
7	<b>Rajendra Mohan Panda</b>	Prof. B.S. Daya Sagar, SSIU, ISI, Bengaluru and Dr. Mukund Dev Behera, Centre for Oceans, rivers, Atmosphere and Land Sciences, IIT Kharagpur	Study on chlorophyll Concentration Estimation and Plant Diversity Assessment in Bhitarkanika and Sundarbans Mangrove Forests	Centre for Oceans, Rivers, Atmosphere and Land sciences (CORAL)	Indian Institute of Technology, Kharagpur
8	<b>Sajana, C</b>	Dr. M. Krishnamurthy, DRTC, ISI, Bengaluru	Research Trends of Space Technology Scientists in reputed International Journals: A Bibliometric Study	Library & Information Science	Bharathiar University, TN
9	<b>Prakasha</b>	Dr. M. Krishnamurthy, DRTC, ISI	Knowledge and Skill requirements for the Health Science Library Professionals in Karnataka: A study	Library & Information Science	Bharathiar University, TN
10	<b>Anjan Hazra</b>	Dr. Sauren Das, AERU, ISI, Kolkata and Prof. Chandan Sengupta, University of Kalyani	On the molecular consideration of tea antioxidant quality and their shelf life assessment	Botany	University of Kalyani
11	<b>Fahimeh Alaei</b>	Prof. Michael Blumenstein, Griffith University, Australia and Prof. Umapada Pal, CVPRU, ISI, Kolkata	Texture Feature-based Document Image Retrieval	School of Information and Communication Technology	Griffith University, Australia
12	<b>Nilanjana Bhattacharya</b>	Prof. Umapada Pal, CVPRU, ISI, Kolkata and Dr. Sanjit Setua, University of Calcutta	Towards Development of a System for Bangla Online Handwritten Text	Computer Science	University of Calcutta
13	<b>Sukalyan Som</b>	Dr. Sarbani Palit, CVPRU, ISI, Kolkata and Prof. K.N.Dey (Retired), Dept. of Computer Science and Engineering, Calcutta University	Towards the Development of Image Security, Authentication and Quality Assessment Techniques	Computer Science & Engineering	University of Calcutta
14	<b>Romi Banerjee</b>	Prof. Sankar Kumar Pal, CSCR, ISI, Kolkata	Machine-mind Design for Natural Language Comprehension	Computer Science	University of Calcutta

### C. Research Fellows who have been awarded Ph. D degree by Academic Bodies other than ISI for work done under supervision of ISI faculties

SI No.	Name of the Scholar	Name(s) of the Supervisor(s)	Title of the Thesis	Department	University
1	<b>Rajiv Sambasivan</b>	Dr. Sourish Das, CMI and Dr. Sasanka Roy, ACMU, ISI, Kolkata	Some Computational Approaches for Machine Learning on Big Datasets	School of Computer Science	Chennai Mathematical Institute
2	<b>Abhijit Adhikari</b>	Dr. Animesh Dutta, NIT Durgapur and Dr. Biswanath Dutta, DRTC, ISI, Bengaluru	A Framework for Measuring the Semantic Relatedness between Concepts	Computer Science & Engineering	National Institute of Technology (Durgapur)

## 2.4 Placements

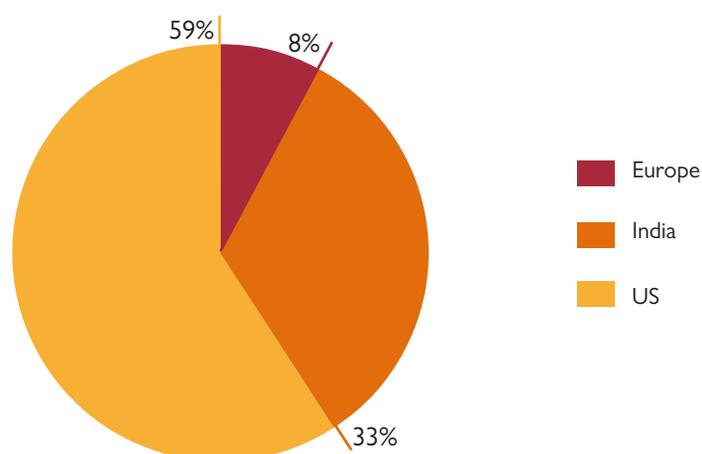
The Indian Statistical institute has been conducting a number of degree and diploma programmes in Statistics, Mathematics, Quantitative Economics, Computer Science as well as Quality, Reliability and Operations Research for the past several decades. In particular, its flagship programmes in Statistics, both at the undergraduate and postgraduate levels, are unmatched at the national level and have earned a well-deserved reputation internationally. Depending upon their inclinations and aptitude, students completing postgraduate programmes successfully can opt for higher education or for jobs in industry or the corporate sector.

### Higher Education

Given the excellent education that students receive under the well-designed, modern curriculum at ISI, a majority of them opt for higher education by joining PhD programmes in world-renowned universities and institutions (national and international), after completing their post-graduate education in ISI.

At the conclusion of the academic year 2018-19, a large number of students completing various Master's degree programmes at ISI, secured admission to PhD programmes conducted by prestigious national and international universities, very often after a highly competitive selection process.

### Destinations for Higher Education



The Universities/ Institutions in which these students joined PhD programmes in 2019-20 are listed below:

#### The United States of America:



#### Europe:



#### National Institutes/Universities:



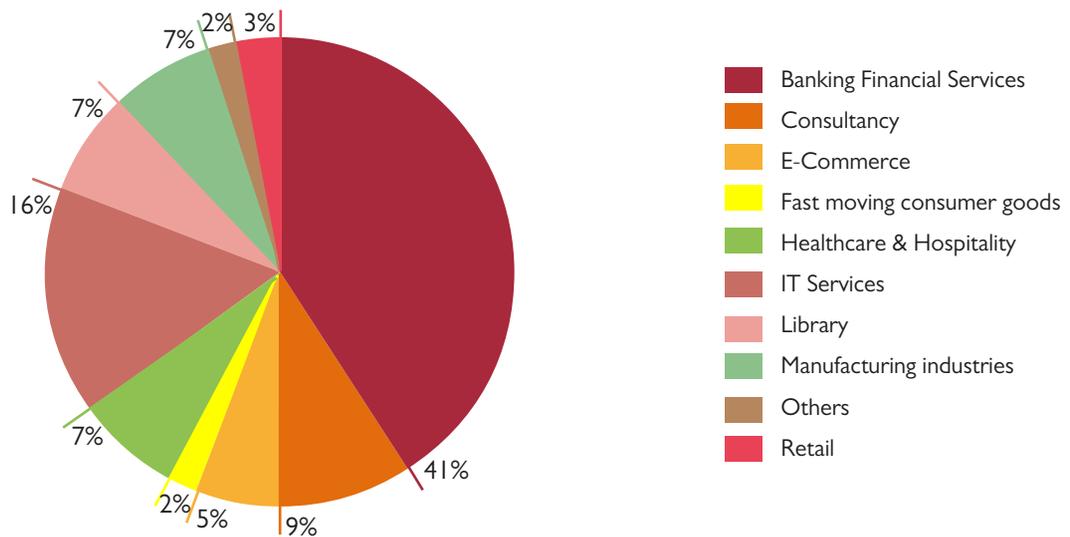
## Placement In Industry

Postgraduate students who are on the verge of passing out are successfully placed with leading companies in the corporate sector through an effective placement programme conducted by the Institute through a Placement Committee at ISI Kolkata, as well as Placement Cells at the Bengaluru, Delhi and North-east centres. Internships in the corporate sector are also arranged for students through the placement programme.

### Overview of Offers (in Rs. LPA) Received by Students from Industry (2019-20)

Location	Maximum	Average
ISI Bengaluru	17	13.5
ISI Delhi	31	18.3
ISI Kolkata	42	19.8

### Industry Placement-Sector-wise split



Some of the reputed Companies, which recruited post-graduate ISI students in 2019, include -



Some of the Educational Institutions which recruited students, graduating in 2019-20, were -



## Placement of Post Graduate Diploma in Business Analytics (PGDBA) Students

The two-year Post Graduate Diploma in Business Analytics (PGDBA) programme, jointly offered by IIM Calcutta, ISI and IIT Kharagpur, aims to train graduates from diverse disciplines to become top-notch business analytics professionals employable by leading Indian and foreign firms. Given the unique focus of the programme, it is not surprising that all graduating PGDBA students opt for placement in industry and receive handsome offers from leading companies every year. Placement of the graduating PGDBA students is conducted by the placement offices of the three institutes on a rotation basis. For the 2017-19, it was conducted by IIT Kharagpur. Industry internship, which is a mandatory component of the final semester of the programme, is also facilitated through the respective PGDBA placement offices. Students receive attractive internship offers every year from reputed companies.

### Statistics Related to PGDBA Internships and Placements (2019-20)

#### Placements

	Placement: 2017-19 Batch
<b>Total Number of Students</b>	52
<b>Total Placed</b>	52
<b>Maximum Salary/ Stipend</b>	Rs. 40.97 (LPA)
<b>Average Salary/ Stipend</b>	Rs, 25.05 (LPA)

#### Internship

	Internship: 2018-20 Batch
<b>Total Number of Students</b>	57
<b>Total Placed</b>	57
<b>Maximum Salary/ Stipend</b>	Rs. 1.72 lakhs/month
<b>Average Salary/ Stipend</b>	Rs. 1.33 lakhs/month

Companies which recruited students include reputed organizations such as:

 ALVAREZ & MARSAL	 AMERICAN EXPRESS	 Deloitte.	 EA ELECTRONIC ARTS™	 EXL	 FUSO
 INDIA VALUE FUND	 Ittiam	 JPMorganChase	 LARSEN & TOUBRO	 Mahindra	 MasterCard
 McKinsey & Company	 Microsoft	 GAMES 24 7	 pwc	 rediff	 SOCIETE GENERALE
 TATA	 CEB WHAT THE BEST COMPANIES DO	 UnitedHealth Group	 YES BANK	 ENVESTNET Yodlee	

## 2.5 International Training Programme- International Statistical Education Center (ISEC)

Founded in	: 1950
Founded by	: Professor P.C. Mahalanobis
Location in ISI	: C.D. Deshmukh Bhawan, 202, B.T. Road, ISI, Kolkata
Member Secretary, ISEC (2019-2020)	: Professor Ayanendranath Basu
Present Chairman, Board of Directors	: Professor S.P. Mukherjee (since 2015)

The Centre opened at Kolkata through an agreement between the International Statistical Institute and the Indian Statistical Institute (ISI) and is run by ISI under the auspices of the Government of India. The Centre functions under a Joint Board of Directors. Professor P.C. Mahalanobis was the Chairman of the Board of Directors since 1950 until his death in 1972. Subsequently, Professor C.R. Rao had been the Chairman of the Board till 2015.

The centre aims to provide training in theoretical and applied statistics at various levels to selected participants from countries of the Middle East, the South and the South-East Asia, the Far-East and the Commonwealth countries of Africa. The primary training programme is a 10-months regular course in Statistics (titled "Statistical Theory and Applications") leading to a Statistical Training Diploma. In addition, special courses on different topics are also organized, as deemed necessary.

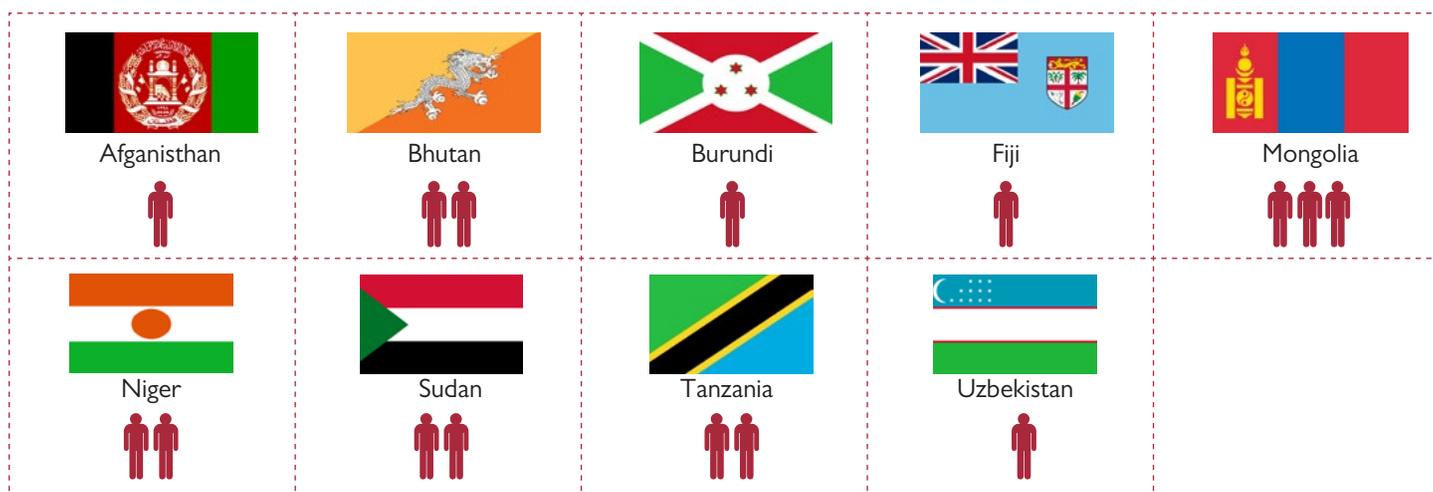
Till date, more than 1690 trainees from some 85 countries have received the Statistical Training Diploma.

### **(INCOMING Batch of 2019-20)**

The 73rd term of the ISEC Regular Course (2019-2020) commenced on August 01, 2019. This batch consisted of 15 trainees from nine countries.



ISEC 2019-20 batch trainees visiting Bishnupur Rice Mill, Bishnupur, West Bengal



All the trainees were supported by fellowships under the Indian Technical and Economic Co-operation (ITEC), programme of the Ministry of External Affairs (MEA), Government of India.

Teaching of the various modules of the Regular Course (August 2019 to May 2020) was conducted by

- Regular faculty and scientific staff of ISI Kolkata;
- Officers of the Government of India at the National Statistical Systems Training Academy (NSSTA), the National Sample Survey Office (NSSO), the Directorate General of Commercial Intelligence & Statistics (DGCIS);
- Officers of the Government of West Bengal affiliated to various ministries as well as the Bureau of Applied Economics and Statistics

In view of the COVID-19 pandemic, regular classroom lectures were suspended from March 2020. Online classes were conducted subsequently for the remaining period.



Address by Prof. Ayanendranath Basu at the inaugural ceremony



Trainee introduction at the inaugural ceremony

### (OUTGOING Batch of 2018-19)

The 72nd term of the ISEC Regular Course (2018-2019) ended in May 2019. Fourteen trainees, from 11 countries, attended this course.



All the trainees were awarded the Statistical Training Diploma at the Convocation held on 30th May, 2019 (*vide* ISEC Convocation under EVENTS).



# 03

## RESEARCH ACTIVITIES



**No. of Internal  
Projects- 70**



**Ongoing-39**



**Completed-31**



**No. of External  
Projects- 168**



**Ongoing-81**



**Completed-87**



**No. of Government  
Projects- 8**



**Ongoing-02**

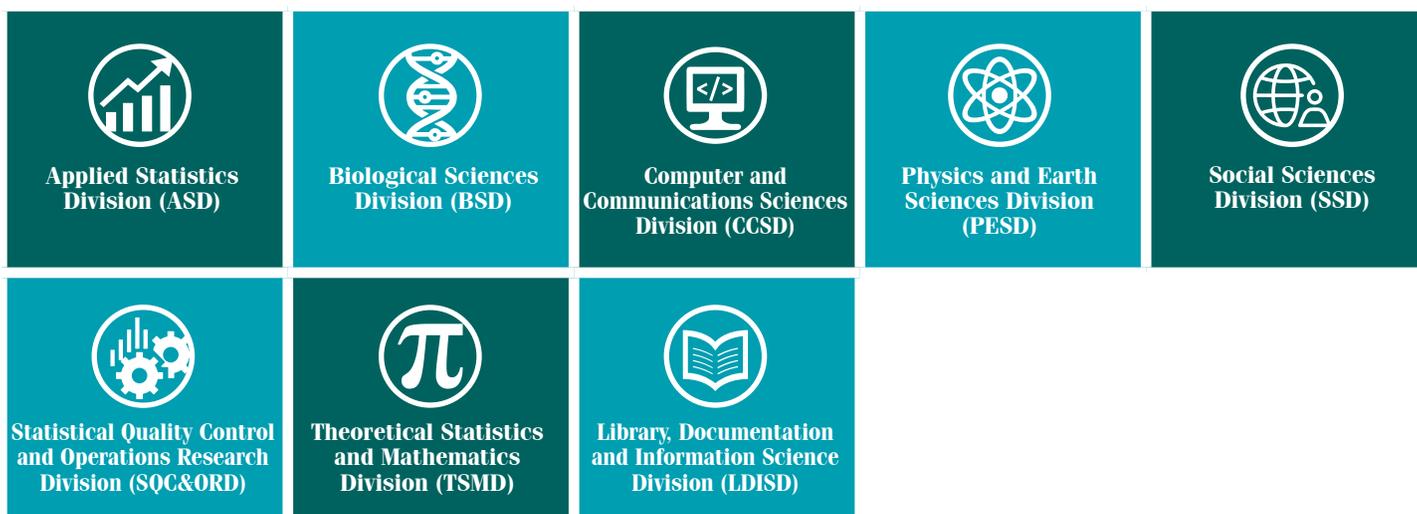


**Completed-06**

## RESEARCH ACTIVITIES

The major thrust of the Institute is on research in various disciplines and the activities of the Institute are organized under divisions, which have multi-locational units. Scientists of the Institute carry out independent research in their own basic discipline and also undertake interdisciplinary research in collaboration with other units within the Institute and also with outside organizations. The Institute also takes up various internally and externally funded projects in diverse fields on challenging live problems of national and international importance. As a part of research activities, scientists of the Institute are involved in consultancy work as well. The Institute has a network of units under the Statistical Quality Control and Operations Research Division which, in addition to research and training activities, also specialize in providing technical consultancy to public and private organizations for developing the most up-to-date quality management systems and in solving critical problems of quality, reliability and productivity.

This section gives a listing of the principal areas of work and the projects undertaken by the faculty, over the past year, of the scientific divisions of the Institute, namely, the Divisions of:



**Computer and Statistical Services Centre (CSSC)**

## ACADEMIC CENTRES

- Centre for Soft Computing Research
- Centre for Artificial Intelligence and Machine Learning
- R. C. Bose Centre for Cryptology and Security



# APPLIED STATISTICS DIVISION (ASD)

**Professor In-Charge:** SUMITRA PURKAYASTHA, ASU Kolkata  
Office: 8th floor, S.N. Bose Bhawan, ISI, Kolkata-700 108

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## **1. Applied and Official Statistics Unit (AOSU), North-East Centre, Tezpur**

Head of Unit: NITYANANDA SARKAR (till January 31, 2020)  
TAPAN CHAKRABORTY (February 1, 2020 onwards)  
Number of Faculty: One (1)  
Office: Punioni, Solmara, ISI, Tezpur, Assam- 784501

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## **2. Applied Statistics Unit (ASU), Bengaluru**

Head of Unit: C. R. E. RAJA  
Number of Faculty: One (1)  
Number of Research Scholars: Two (2)  
Office: 8th Mile, Mysore Rd, ISI, Bengaluru 560059

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## **3. Applied Statistics Unit (ASU), Chennai**

Head of Unit: D. SAMPANGIRAMAN  
Number of Faculty: Two (2)  
Office: 110 Nelson Manickam Road, Aminjikarai, ISI, Chennai-600 029

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## **4. Applied Statistics Unit (ASU), Kolkata**

Head of Unit: SUBHAMOY MAITRA  
Number of Faculty: Fourteen (14)  
Number of Research Scholars: Forty (40)  
Office: 8th floor, S.N. Bose Bhawan, ISI, Kolkata-700 108

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## **5. Interdisciplinary Statistical Research Unit (ISRU), Kolkata**

Head of Unit: SUBIR KUMAR BHANDARI  
Number of Faculty: Nine (9)  
Number of Research Scholars: Thirteen (13)  
Office: 4th floor, R. A. Fisher Bhavan, ISI, Kolkata-700 108

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# APPLIED & OFFICIAL STATISTICS UNIT (AOSU), NORTH-EAST CENTRE, TEZPUR

The research focus of the Applied and Official Statistics Unit (AOSU) is on different areas of applied statistics with emphasis on topics concerning the North-Eastern region and Official Statistics. Short-term training programmes and special 'Schools' on advanced topics of both theoretical and applied statistics for research fellows and other researchers from N-E region are organised so that higher education in Statistics gets a major impetus in the N-E region. Short-term training programmes on use of statistics in government decision-making, including survey methodologies and data analysis for N-E state government officials are also undertaken by this Unit.

## Current Area of Research

Name	Research topic(s)	Collaborators
Holendro Singh Chungkham	Linkages between psychosocial working conditions and health outcomes Applications of longitudinal models in work-environment and health	Researchers from Stockholm University, Sweden

## Projects

### Completed Projects: Internally funded

Sl. No	Name of the project	Starting Date	End Date	Principal Investigator(s)
1	Lagged effects of rainfall on malaria cases and seasonal variation: a case study of some districts of Meghalaya.	01.08.2019	31.03.2020	Holendro Singh Chungkham

# APPLIED STATISTICS UNIT (ASU), BENGALURU

The Applied Statistics Unit at IS Bengaluru was created in 2019. The unit participates in teaching for the B. Math. and M. Math. programmes of the centre in addition to research activities including guiding summer interns and master's projects, serving in scientific programme committees of conferences.

## Current Area of Research

Name	Research topic(s)	Collaborators
Rituparna Sen	Functional Data Analysis, Financial Statistics, Risk Estimation	Bhaswati Ganguli, Neelesh Upadhye, Sourish Das

## Projects

### Ongoing Projects: Internally funded

Sl. No	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Research Workshop and Conference on Statistical Methods in Finance	01.04.2019	1 year	Rituparna Sen

## APPLIED STATISTICS UNIT (ASU), CHENNAI

ASU Unit is actively involved in teaching and research. Main areas of research are survival and Reliability Analysis and Regression Analysis

### Current Area of Research

Name	Research topic(s)	Collaborators
Sudheesh Kumar Kattumannil	Censored regression	Prof. Hira L Koul (Michigan State University, USA).
	Gini Covariance	Prof. N Balakrishna (McMaster University, Canada).
	U-statistics for censored and truncated data	Prof. Min Xie (City University of Hong Kong, Hong Kong).

### Projects

#### Ongoing Projects: Internally funded

Sl. No	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Semiparametric Analysis of Transformation Models with Measurement Error in Covariates	December 2, 2019	3 years	Sudheesh K Kattumannil

## APPLIED STATISTICS UNIT (ASU), KOLKATA

Scientists of the Applied Statistics Unit (ASU) conduct research in various areas of statistics, mathematics and computer science, with special emphasis on applications. They regularly conduct research and development projects, sometimes in collaboration with scientists of other units of ISI and/or other organisations. The faculty of ASU is also involved in various teaching and training activities. Apart from participating in the teaching of all the regular courses of the Institute held at Kolkata, they also conduct a Statistical Traineeship programme for fresh master's degree-holders in Statistics. This unit also conducts teaching/training programmes like winter/summer schools, North-East Training, UGC-sponsored refresher courses and workshops.

### Current Area of Research

Name	Research topic(s)	Collaborators
Anup Dewanji	Survival Analysis Reliability Optimal Design	Aditya Chattopadhyay (University of Calcutta); Samrat Hore (Tripura University); Sudipta Das (Vivekananda University, Belur); Georg Luebeck (Fred Hutchinson Cancer Research Center, Seattle, USA); Dan Krewski (University of Ottawa)
Atanu Biswas	Discrete-valued time series, Sequential analysis, Clinical trials	
Debapriya Sengupta	Multivariate and Statistical Decision Theory	
	Parametric and non-parametric Regression techniques	
	General application of statistical methods in real data and development of statistical learning algorithms in Data science	
Debasis Sengupta	Statistical models and methods for various types of real data	
Mausumi Bose	Obtaining efficient designs for determining the best treatment for total effects	
	Obtaining shorter prediction intervals for anonymous individual assessments in group decision making in Operations Research	
Mridul Nandi	Cryptology	Indo-Israel (DST)
Subhamoy Maitra	Cryptology	BARC
Sumitra Purkayastha	Copula based methods and inference, with focus on multivariate longitudinal models	

## Projects

### Completed Projects: Internally funded

Sl. No	Name of the project	Starting Date	End Date	Principal Investigator(s)
1	Summer/Winter School, Head, ASU	01.04.2019	31.03.2020	Subhamoy Maitra
2	Mathematical Qualification.... Network Proteins	01.04.2019	31.03.2020	Pabitra Pal choudhory

### Ongoing Projects: Externally funded

Sl. No	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Cryptography and Cryptanalysis	01.04.2016	5	Subhamoy Maitra	Dept. of Atomic Energy (DAE), Board of Research in Nuclear Sciences, Govt. of India

### Completed Projects: Externally funded

Sl. No	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Indo-Israel'	01.04.2018	31.03.2020	Mridul Nandi	DST, Govt. of India

### Completed Projects: Projects for Government of India

Sl. No	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Survey for Studying the Efficiency and Impact of NATs	01.04.2016	31.03.2020	Sumitra Purkayastha	Board of Practical Training (ER), MHRD, Govt. of India
2	Critical Appraisal and Methodological Recommendations on TV Viewership Study (CAMROTS)	11.04.2017	31.03.2020	Prasun Das	BAARC

# INTERDISCIPLINARY STATISTICAL RESEARCH UNIT (ISRU), KOLKATA

This unit was created within the Applied Statistics Division in 2006. It was initially named the Bayesian and Interdisciplinary Research Unit, but was rechristened as the Interdisciplinary Statistical Research Unit (ISRU), in October 2014. The members of its faculty take an active and significant part in the regular teaching programmes of the Institute and conduct a variety of interdisciplinary research (with Statistics at the core) in a number of areas, namely, Robust Statistics, Design of Experiments, Multiple Hypothesis Testing, Bayesian Statistics, Bayesian Computation, Stochastic Differential Equations, Biostatistics, Statistical Genetics, Longitudinal Data Analysis, Bayesian Semiparametric methods, Wireless Sensor Networks, Statistical Image Analysis, Statistical Process Control, Jump Regression Analysis, Classification, Clustering, Content-based Image Retrieval, and so on. In addition, they also participate regularly in short-term teaching and training programmes conducted by other units as well as ISEC. The unit also organizes workshops on various topics annually.

### Current Area of Research

Name	Research topic(s)	Collaborators
Abhik Ghosh	Robust Statistical Inference for various Applications	Ayanendranath Basu (ISRU, ISI Kolkata), Leandro Pardo (Universidad Complutense de Madrid, Spain), Nirian Martin (Universidad Complutense de Madrid, Spain), Claudio Agostinelli (University of Trento, Italy)
	Connections of Robust Minimum Divergence Inference with Generalized Information Theory	Ayanendranath Basu (ISRU, ISI Kolkata)

Name	Research topic(s)	Collaborators
	Robust Inference for High and Ultra-high dimensional Data	Leandro Pardo (Universidad Complutense de Madrid, Spain), Nirian Martin (Universidad Complutense de Madrid, Spain), Subhabrata Majumdar (AT&T Labs, USA), Magne Thoresen (University of Oslo, Norway)
	Robust Discriminant Analysis	Rita SahaRay (ISRU, ISI Kolkata)
	Stable Feature Selection Procedures	Debarka Sengupta (IIIT Delhi) and Sanghamitra Bandyopadhyay (MIU, ISI Kolkata)
	Robust Methods in Bioinformatics	Ujjwal Maulik (Jadavpur University, Kolkata), Sanghamitra Bandyopadhyay (MIU, ISI Kolkata), Debarka Sengupta (IIIT Delhi), Vanda M. Lourenco (Universidade NOVA de Lisboa, Portugal)
	Applications of Statistics within Econophysics & Socio-economic Applications	Banasri Basu (PAMU, ISI Kolkata)
	Rainfall Modelling	Arnab Hazra (KAUST, Saudi Arabia)
	Robust Inference for Stochastic Processes	
Amita Pal	Robust support Vector Machines	
	Community detection in Networks	
Ayanendranath Basu	A new weighted likelihood method for robust estimation	Suman Majumdar (North Carolina State University, USA), Subir K. Bhandari (ISRU, ISI Kolkata)
	Robust Wald type tests for statistical inference	Abhik Ghosh (ISRU, ISI Kolkata), Abhijit Mandal (Wayne State University, Detroit, USA), Nirian Martin (Universidad Complutense de Madrid, Spain), Leandro Pardo (Universidad Complutense de Madrid, Spain)
	Estimation of the “optimal” tuning parameter for robust inference	M. C. Jones (Open University, UK)
	Statistical Inference based on the extended Bregman divergence	
	Robust estimation for the proportional hazards model under random censoring	Abhik Ghosh (ISRU, ISI Kolkata)
	Minimum Bregman divergence inference	Soumik Purkayastha (University of Michigan, USA), Saptarshi Roy (University of Michigan, USA), Kaustav Chakraborty (University of Illinois, USA), Somnath Bhadra (University of Florida, USA)
	Robust estimation and clustering for multivariate Gaussian data	Abhik Ghosh (ISRU, ISI Kolkata)
	Robust Singular Value Decomposition	Abhik Ghosh (ISRU, ISI Kolkata)
	Robust score-type tests	Abhik Ghosh (ISRU, ISI Kolkata), Leandro Pardo (Universidad Complutense de Madrid, Madrid, Spain), Nirian Martin (Universidad Complutense de Madrid, Madrid, Spain)
	Robust estimation in mixed linear models	Giovanni Saraceno (University of Trento, Italy), Claudio Agostinelli (University of Trento, Italy), Abhik Ghosh (ISRU, ISI Kolkata)
	Construction of scale invariant entropy measures by generalizing the Renyi entropy	Abhik Ghosh (ISRU, ISI Kolkata)
	Robust estimation for skewed data	Abhik Ghosh (ISRU, ISI Kolkata)
Kiranmoy Das	Modelling Multiple Time-Varying Related Groups	Michael J. Daniels (University of Florida, USA), Pulak Ghosh (IIM Bengaluru)
	Joint Modeling of multiple longitudinal outcomes and time to event data	Partha Sarkar (University of Florida, USA)
	Model free feature screening for ordinal responses	Rohit Kanrar (Iowa State University, USA)

Name	Research topic(s)	Collaborators
	Wireless communications	Abhirup Banerjee (University of Calcutta), Aditi Chatterjee (Jadavpur University)
	Semi-parametric Dynamic Hurdle model	Sarah Brown (University of Sheffield, UK)
Partha Sarathi Mukherjee	Image denoising using jump regression analysis	
	Image deblurring using jump regression analysis	Dr. Yicheng Kang (Bentley University, USA)
	Image registration	
	Statistical Process Control	
	Applications of statistical tools in various scientific research	Dr. Lilian Calderon-Garciduenas (University of Montana, USA)
Rita Saha Ray	Robust Generalised discriminat Analysis	Abhik Ghosh (ISRU, ISI Kolkata), Sayan Chakraborty (University of Illinois at Urbana-Champaign, Illinois, USA)
	Optimal Designs in One Way Heteroscedastic Model with Covarites for Test Treatments vs.multiple Controls Comparisons	Ganesh Dutta (Basanti Devi College, Kolkata)
Smarajit Bose	Classification and clustering with big data	
	Combining classifiers	Mousumi Banerjee (University of Michigan, USA)
	Content-based image retrieval (CBIR) with deep learning	
Sourabh Bhattacharya	Bayesian Multiple Testing	
	Bayesian Spatial and Spatio-Temporal Statistics	
	Bayesian Characterizations of Stochastic Processes	
	Stochastic Calculus	
	Bayesian Inverse Regression	
	Climate Change	
	Bayesian Riemann Hypothesis	
	Bounds on FWER in terms of correlation for Multiple Hypotheses	
Subir Kumar Bhandari	Testing in the dependent equicorrelated normal setup	
	Optimal conditional test in equicorrelated normal setup for Multiple Hypotheses Testing	

## Projects

### Completed Projects: Internally funded

Sl. No	Name of the project	Starting Date	End Date	Principal Investigator(s)
1	Robust minimum divergence inferences for biostatistics and bioinformatics	November, 2018	October, 2019	Abhik Ghosh

### Ongoing Projects: Externally funded

Sl. No	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Robust minimum divergence inferences for Non-Standard data problems: Emphasis on Censored, Longitudinal & High-dimensional data and Machine Learning and Multisample set-ups	02.11.2016	5 Years	Abhik Ghosh	DST
2	Unravelling the interdisciplinary facets of physics and data sciences in real life socio-economic challenges	December, 2019	3 Years	Banasri Basu	SERB



# BIOLOGICAL SCIENCES DIVISION (BSD)

**Professor In-Charge:** SUSMITA MUKHOPADHYAY, BAU Kolkata

**Office:** 3rd floor, R. A. Fisher Bhavan, ISI, Kolkata-700 108

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## **1. Agricultural & Ecological Research Unit (AERU), Giridih & Kolkata**

Head of Unit: SABYASACHI BHATTACHARYA

Number of Faculty: Nine (9)

Number of Research Scholars: Twenty-seven (27)

Giridih Office: New Barganda, ISI, Giridih, Jharkhand- 815 301

Kolkata Office: 2nd floor, R. A. Fisher Bhavan, ISI, Kolkata-700 108

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## **2. Biological Anthropology Unit (BAU), Kolkata**

Head of Unit: SUSMITA MUKHOPADHYAY

Number of Faculty: Three (3)

Number of Research Scholars: Six (6)

Office: 3rd floor, R. A. Fisher Bhavan, ISI, Kolkata-700 108

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## **3. Human Genetics Unit (HGU), Kolkata**

Head of Unit: INDRANIL MUKHOPADHYAY

Number of Faculty: Four (4)

Number of Research Scholars: Eight (8)

Office: 2nd floor, A.N. Kolmogorov Bhavan, ISI, Kolkata-700 108

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# AGRICULTURAL & ECOLOGICAL RESEARCH UNIT (AERU), KOLKATA & GIRIDIH

The Agricultural and Ecological Research Unit is based at Kolkata with a branch at Giridih and comprises of nine faculty members. The Scientific workers of the Unit are engaged in research and academic activities on Agriculture and Ecology. During the period under consideration the scientific workers of the Unit have undertaken research on various ecological aspects as invasive plants, zooplankton-phytoplankton interaction, plant-nematode interaction etc. and also in Agriculture and social aspects such as technology adoption by farmers, use of nanotechnology in Agriculture and various other topics. In addition, the faculty members are also engaged in regular teaching in B. Stat. and M. Stat. programmes in ISI and also in various departments of other Universities.

## Current Area of Research

Name	Research topic(s)	Collaborators
Abhishek Mukherjee	Plant-nematode-endophyte interactions	Dipankar Chakraborty (Department of Biotechnology, University of Calcutta) Sampa Das (Bose Institute, Kolkata)
	Ecological Niche model	Nathan E. Harms (US Army Engineer Research and Development Center, Aquatic Ecology and Invasive Species Branch, USA), Raghu Sathyamurthy (Biosecurity Flagship, CSIRO, Brisbane, Australia)
	Applications of nanotechnology in agriculture	Chandan Ghosh (School of Materials Science & Nanotechnology, Jadavpur University)
Anjana Dewanji	Invasive plants, Elemental pollution in waterbodies, Phytoremediation	M. Sudarshan, UGC-DAE Consortium for Scientific Research, Bidhan Nagar, Kolkata S.C. Santra (Department of Environmental Science, Kalyani University, Nadia)
Arunava Goswami	Nanobiotechnology	
Pabitra Banik	Climate change and Socioeconomic situation of the Sundarbans	Christopher Edmonds (Tokyo International University, Japan), Ilan Noy (Victoria University of Wellington, New Zealand)
	Ecological aspect of the Sundarban area	K. C. Rath (Dept. of Geography, Utkal University)
	Technology adoption by the farmers	Christipher Edmonds (Tokyo International University, Japan)
Pradip Bhattacharyya	Fluoride decontamination of ground water using exfoliated biochar based sorptive system: A cradle-to-grave approach through vermitechnology	Satya Sundar Bhattacharya (Tezpur University), Dibyendu Sarkar (Stevens Institute of Technology, USA), Rupali Datta (Michigan Technological University, USA)
	Vetiver based phytoremediation of metal contaminated chromium asbestos mines of Jharkhand: A cradle to grave approach through vermitechnology	Satya Sundar Bhattacharya (Tezpur University), Dibyendu Sarkar (Stevens Institute of Technology, USA), Rupali Datta (Michigan Technological University, USA)
Rabi Ranjan Chattopadhyay	A search for novel natural antioxidants from peels of some selected varieties of potato for developing omega-3 fatty acids fortified food	Smarajit Bose (ISRU, ISI, Kolkata)
Sabyasachi Bhattacharya	Zooplankton-Phytoplankton interaction	Santanu Ray (Department of Zoology, Visva-Bharati University, Shantiniketan)
	Ex-situ & In-vitro culture protocol development for marine planktons	Santanu Ray (Department of Zoology, Visva-Bharati University, Shantiniketan)

Name	Research topic(s)	Collaborators
	Behavioural ecology of migratory and cooperative birds and their economical impacts using mathematical and statistical approaches.	Santanu Ray (Department of Zoology, Visva-Bharati University, Shantiniketan)
	Avian microbial interaction study for riverside nest burrowing birds	Santanu Ray (Department of Zoology, Visva-Bharati University, Shantiniketan)
	Development of statistical methodologies for comparing growth rates under various modelling structure	
	Goodness of fit test and application of relative growth rates for growth curve inference problems	Bratati Chakraborty (, Department of Statistics, Lady Brabourne College, Kolkata)
	Growth curve extensions, unification, identification and characterization	Amiya Ranjan Bhowmick (Dept. of Mathematics, Institute of Chemical Technology, Mumbai), Joydev Chattopadhyay (AERU, ISI, Kolkata)
	Developing and implying growth curve models for biological populations	Amiya Ranjan Bhowmick (Dept. of Mathematics, Institute of Chemical Technology, Mumbai)
	Modelling with density dependent intrinsic growth rate such as autocrine growth rate	
	Identification of life history patterns of different animals using extended theta logistic and other growth curve models	
	Epidemiology, outbreak assessment and management strategy development of Distemper disease in endangered populations such as African wild dog	Banamali Roy (Bangabasi Evening College, Kolkata)
	Ecological importance analysis of biological species by using ecological networking	Ram Rup Sarkar (Chemical Engineering & Process Development, CSIR-National Chemical Laboratory, Pune)
	Extinction risk assessment of harvestable biological populations (e.g. fishes)	Bapi Saha (Department of Mathematics, Government College of Engineering & Textile Technology, Kolkata)
	Evidences of Allee Effect in Winter Crops	Soumalya Mukhopadhyay (Department of Statistics, Visva-Bharati University, Shantiniketan), Pabitra Banik (AERU, ISI, Kolkata), Ravi Chandra Sharma (Rashtriya Chemicals and Fertilizers Ltd., Mumbai)
Sauren Das	Agronomic trait associate marker development in tea ( <i>Camellia chinensis</i> )	
Suparna Mandal Biswas	<i>Sterculia foetida</i> , L. – Eco-friendly, cost effective and rich sources of nutritious edible oil, animal food supplements as well as biofuel and its multimodal application to environmental perspectives.	Lalit Kumar (Division of crop Sciences, Indian Institute of Pulses Research, Kanpur)

## Projects

### Ongoing Projects: Internally funded

Sl. No	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Cadencing photosystem-II with naturally occurring $\text{CaMn}_4\text{O}_5$ nano-cluster and nanoparticles of hematite ( $\alpha\text{-Fe}_2\text{O}_3$ )	01 April, 2018	3 years	Arunava Goswami
2	Strategies for improvement of livelihood security of the farming community in the Indian Sundarbans under present scenario of climate change	01 April, 2018	3 years	Pabitra Banik

Sl. No	Name of the project	Starting Date	Duration	Principal Investigator(s)
3	A search for novel natural antioxidants from peels of some selected varieties of potato for developing omega-3 fatty acids fortified food	01 April, 2018	3 Years	Rabi Ranjan Chattoadhyay
4	<i>Sterculia foetida</i> , L – Eco-friendly, cost effective and rich sources of nutritious edible oil, animal food supplements as well as biofuel and its multimodal application to environmental perspectives.	01 April, 2018	3 years	Suparna Mandal Biswas
5	Host-parasite interaction between the rice root knot nematode ( <i>Meloidogyne graminicola</i> ) and rice	01 April, 2018	3 years	Abhishek Mukherjee
6	Utilization of Brick factory coal ash through application of vermitechnology	April 1, 2018	3 years	Pradip Bhattacharyya
7	Biochemical and physiological portrayal of Darjeeling tea cultivars towards the selection of superior clones against abiotic stress	April 1, 2017	4 years	Sauren Das

**Completed Projects: Internally funded**

Sl. No	Name of the project	Starting Date	End Date	Principal Investigator(s)
1	Invasive alien species – a friend or foe?	01 April, 2017	31 March, 2020	Anjana Dewanji

**Ongoing Projects: Externally funded**

Sl. No	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Delaying programmed cell death of beneficial gut bacteria in micro-gravity using oxide and complex nanoparticles	July 23, 2019	3 Years	Arunava Goswami	ISRO, Govt. of India
2	Climate change and livelihoods in disaster-prone coastal areas of Bay of Bengal	October 14, 2019	1 year	Pabitra Banik	Tokyo International University
3	All India Corodinated Projects on Nematodes	April 1, 2018	NA	Abhishek Mukherjee	ICAR, Govt. of India
4	Characterization and hazard prediction of tannery waste sludge in West Bengal and resource recovery through vermiremediation	August, 2019	3 years	Pradip Bhattacharyya, Sabyasachi Bhattacharya	Dept of Science & Technology and Biotechnology, Govt. of West Bengal

## BIOLOGICAL ANTHROPOLOGY UNIT (BAU), KOLKATA

The current focal areas of research include: (a) Physical and mental health of the elderly inhabiting different locales; (b) Health and survival strategy of manual workers due to loss of job (c) Health related pain threshold and cognition on control of health seeking behaviour in urban and rural areas. The primary engagements of the faculty and associate scientist pertain to conducting bio-anthropological research. The faculty members are also engaged in teaching in Anthropology at B.Stat. level. The Unit organizes Workshops, mostly on (i) Research methodologies for biological sciences in general and biological anthropology in particular, and (ii) Workshops/Summer-Winter Schools on SPSS Statistical software packages.

**Current Area of Research**

Name	Research topic(s)	Collaborators
Barun Mukhopadhyay	Frailty syndrome and its bio-cultural correlates among the rural elderly in West Bengal	Susmita Mukhopadhyay (BAU, ISI)
	Health status, health related quality of life and health care practices among the rural elderly of West Bengal	Susmita Mukhopadhyay (BAU, ISI)

Name	Research topic(s)	Collaborators
	Heat stress and behavior among the elderly in West Bengal among the elderly in West Bengal	Charles Weitz (Department of Anthropology, Temple University, Philadelphia, USA) and Ketaki Das (Public Health Research Officer, West Bengal Voluntary Health Association (WVBVHA))
Subrata K. Roy	Health related pain threshold and cognition of the Santals of Burdwan and Howrah districts	Monali Goswami (Department of Anthropology, University of Calcutta)
Susmita Mukhopadhyay	Health vulnerabilities of elderly women inhabiting slum settlements in Kolkata	
	Mental health and well-being of dementia caregivers in urban areas of West Bengal	Nilanjana Maulik (Alzheimer's and Related Disorders Society of India (ARDSI), Kolkata)

## HUMAN GENETICS UNIT (HGU), KOLKATA

The Unit is continuing with its dual research focus on development of novel statistical methodologies as well as innovative experimental/functional strategies for genomic dissection of complex disorders and quantitative phenotypes. In particular, on the methodological aspects, statistical tests involving association of multivariate phenotypes and integration of genetic, expression and methylation data have been explored; while on the experimental aspects, genetic and epigenetic studies on psoriasis as well as oral, pancreatic and gastric cancers have been carried out. The scientists of the Unit have also been involved in the multicentric initiative SyMeC for understanding the basis of oral and cervical cancer in terms of providing its expertise on database creation and statistical analyses. The faculty of the Unit have also continued participating in regular teaching of degree programmes in the Institute as well as guest faculty of Statistics and Human Genetics modules of masters and Ph.D. level curriculum in Biological Sciences of several Universities.

### Current Area of Research

Name	Research topic(s)	Collaborators
Bidyut Roy,	Epigenetics in oral cancer; mutation in SARS-COV2 virus	Sandip Ghose, Dr. Sk. Hassan, Pabitra Palchoudhury
Indranil Mukhopadhyay	Genomic data integration, Modeling disease dynamics	Sarmistha Das, Partha Pratim Majumder, Pramit Ghosh, Bandana Sen, Saumyadipta Pyne
Saurabh Ghosh	Developing statistical methods for mapping multivariate phenotypes, Genetic Association Analyses of Complex Traits	Sanjeev Jain (NIMHANS), V. Radha (MDDRDF), Sanjit Dey (CU)
Raghunath Chatterjee	Identification of genetic and epigenetic factors on psoriasis pathogenesis, Role of DNA methylation in oral cancer and precancerous conditions, Genomic Islands in bacterial pathogenesis & adaptation	Gobinda Chatterjee (IPGMR/SSKM Hospital), Joy Gopal Ray (Burdwan Dental College & Hospital)

### Projects

#### Ongoing Projects: Internally funded

Sl. No	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Modelling Transcriptional Dynamics with Gene Expression Data	April 1, 2019	3 years	Indranil Mukhopadhyay

#### Completed Projects: Internally funded

Sl. No	Name of the project	Starting Date	End Date	Principal Investigator(s)
1	Software for Genetic Epidemiology	April 1, 2019	March 31, 2020	Saurabh Ghosh
2	Role of microRNAs in Psoriasis pathogenesis	April 1, 2017	March 31, 2020	Raghunath Chatterjee

**Ongoing Projects: Externally funded**

Sl. No	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Statistical detection of regulation using multi-omics	July 01, 2018	3 years	Indranil Mukhopadhyay	IFCAM

**Completed Projects: Externally funded**

Sl. No	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Identification of Genetic and Epigenetic Associations Among Psoriasis patients in India	August 30, 2016	August 29, 2019	Raghunath Chatterjee	SERB, DST, Govt. of India
2	Identification of the contribution of Human Leukocyte Antigen (HLA) alleles and functional coding variants to the risk of psoriasis in patients from West Bengal	September 30, 2016	September 29, 2019	Raghunath Chatterjee	DBT, Govt. of West Bengal





# COMPUTER AND COMMUNICATION SCIENCES DIVISION (CCSD)

**Professor In-Charge:** BHABATOSH CHANDA, ECSU, Kolkata

**Office:** 9th floor, S.N. Bose Bhavan, ISI, Kolkata-700 108

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## 1. Advanced Computing and Microelectronics Unit (ACMU), Kolkata

Head of Unit: SUSMITA SUR-KOLAY

Number of Faculty: Eleven (11)

Number of Research Scholars: Thirty-five (35)

Office: 5th floor, Platinum Jubilee Building, ISI, Kolkata-700 108

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## 2. Computer Science Unit (CSU), Chennai

Head of Unit: SUJATA GHOSH

Number of Faculty: Four (4)

Number of Research Scholars: Four (4)

Office: 110 Nelson Manickam Road, Aminjikarai, ISI, Chennai-600 029

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## 3. Computer Vision and Pattern Recognition Unit (CVPRU), Kolkata

Head of Unit: UMAPADA PAL

Number of Faculty: Six (6)

Number of Research Scholars: Seven (7)

Office: 8th floor, S.N. Bose Bhavan, ISI, Kolkata-700 108

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## 4. Cryptology and Security Research Unit (CSRU), Kolkata

Head of Unit: DEBRUP CHAKRABORTY

Number of Faculty: Four (4)

Number of Research Scholars: Eleven (11)

Office: 3rd floor, C.D. Deshmukh Bhavan, ISI, Kolkata-700 108

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## 5. Documentation Research and Training Centre (DRTC), Bengaluru

Head of Unit: A. R. D. PRASAD (till July 2019)

DEVIKA P MADALLI (August 2019 onwards)

Number of Faculty: Three (3)

Number of Research Scholars: Eight (8)

Office: 8th Mile, Mysore Road, ISI, Bengaluru- 560 059

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## 6. Electronics and Communication Sciences Unit (ECSU), Kolkata

Head of Unit: DIPTI PRASAD MUKHERJEE

Number of Faculty: Seven (7)

Number of Research Scholars: Sixteen (16)

Office: 9th floor, S.N. Bose Bhavan, ISI, Kolkata-700 108

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## 7. Machine Intelligence Unit (MIU), Kolkata

Head of Unit: ASHISH GHOSH

Number of Faculty: Ten (10)

Number of Research Scholars: Twenty-four (24)

Office: 4th floor, Platinum Jubilee Building, ISI, Kolkata-700 108

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## 8. Systems Science and Informatics Unit (SSIU), Bengaluru

Head of Unit: Saroj K. Meher

Number of Faculty: Four (4)

Number of Research Scholars: Five (5)

Office: 8th Mile, Mysore Road, ISI, Bengaluru- 560 059

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# ADVANCE COMPUTING AND MICROELECTRONICS UNIT (ACMU), KOLKATA

The focus of the faculty members of this unit is in the core areas of Computer Science and Engineering, broadly spanning topics in Theoretical Computer Science and High-Performance Computing Systems.

During 2019-20, faculty members of the Unit taught a significant number (nineteen) of compulsory and elective courses in the M.Tech. (Computer Science) programme of the Institute, along with some courses in other degree and diploma programmes, such as B. Stat., M. Stat. and PGDBA. Five research courses were also taught for Ph.D. scholars. Nine students from other Universities/Institutes were supervised for their summer training and project work.

## Current Areas of Research

Name	Research topic(s)	Collaborators
Ansuman Banerjee	Formal Methods, Web Services, Computer Architecture	K. Ray (ISI), H.S.Paul (TCS Research), S. Mohalik and N. C. Nagendra (Ericsson Research)
Arijit Bishnu	Algorithms, Discrete Mathematics, Discrete Geometry	Arijit Ghosh, Gopinath Mishra, Mathew Francis
Arijit Ghosh	Theoretical Computer Science and Combinatorics	A. Bishnu, S. Chakraborty, G. Mishra, S. Sen, M. Paraashar, A. Bhattacharya, J-D. Boissonnat (INRIA), R. Dyer (INRIA), K. Dutta (Univ. Warsaw), N. H. Mustafa (Univ Paris Est), Mathijs Wintraecken (IST Austria), A. Lieutier (Dassault Systèmes)
Krishnendu Mukhopadhyaya	Algorithms for Swarm Robots	Subhash Bhagat, Paola Flocchini, Nicola Santoro
Nabanita Das	Cognitive Radio Networks	S. C. Ghosh (ISI); A. Das Barman (CU); S. Dhar (SJSU, USA)
	Parallel Computing for Online Social Network Analysis	G. Chakraborty (Iwate Prefectural Univ., Japan)
	Mobile Ad Hoc Networks	S. Bhattacharjee (IIT Jammu)
Sandip Das	Graph and geometric algorithm	Binay Bhattacharya (SFU Canada), Swami Sarvottamananda, J. Mukherjee, (RKMVERI), Sagnik Sen (IIT Dharwad), A. Banik (NISER), Eric Sopena LaBRI (France), Florent Foucaud (France), Reza Naserasr (Paris), Dimitri Lajou (Bordeaux), Michel Habib (Paris)
Sasanka Roy	Computational Geometry, Algorithms, Data Structures	S. Bhore, B. Dutta, S. Jana, H. Kaplan, A. Maheshwari, J.S.B. Mitchell, S. Mehrabi, S. C. Nandy, S. Pandit, A. Rahman Molla, S. Sadhu, M. Sharir, M. Smid
Sasthi Charan Ghosh	Mobile Computing, Wireless Network, Device to Device communication	Arpan Chattopadhyay (IIT Delhi)
Sourav Chakraborty	Property Testing and its applications	A. Ghosh, S. Sen, G. Misra & A. Rahman (ISI), R. Bhattacharya (NISER), K. Meel, A. Dinu, Y. Pote & P. Golia (NUS), A. Trehan (Loughborough), E. Fischer (Technion)
	Fourier Analysis of Boolean Functions and applications	M. Paraashar (ISI), N. Shagrithaya & R. Mittal (IIT Kanpur), A. Chattopadhyay & T. Molli (TIFR), S. Sanyal (IIT Kgp), S. Arunachalam (IBM), S. Laplante & A. Sunny (IRIF, Université de Paris), C. Kayal (ISI), A. Gal (UT, Austin), N. Saurabh (Technion), R. de Wolf (CWI),
	Communication Complexity	M. Paraashar, A. Ghosh, & G. Misra (ISI), N. Mande (Georgetown University), A. Chattopadhyay (TIFR)
	Discrete Geometry	A. Ghosh, & S. Nandi (ISI)
	Proof Complexity	S. Ghosh & A. Ghosh (ISI)
	Streaming and Online Algorithms and its applications	K. Meel (NUS), V. Variyam (Nebraska), A. Sarkar (Dartmouth)
Subhas C. Nandy	Geometric Optimization Problems	Anil Maheshwari (Carleton U), Arunabha Sen (Arizona State U), Supantha Pandit, (DA-IICT)

Name	Research topic(s)	Collaborators
Susmita Sur-Kolay	Algorithms for Physical Design Automation, Hardware Security, Quantum Circuit Synthesis and Error Correction	P. Banerjee (CU), D. Saha (CU), A. Chakrabarti, (CU), Y.-W. Chang (NTU Taiwan)

## Projects

### Ongoing Projects: Internally funded

Sl. No	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Co-operative Channel Sharing in Cognitive Radio Ad Hoc Networks (CRAN)	April 1, 2018	3 years	Nabanita Das
2	Scalable Algorithms for Design, Analysis and Verification for Web Services (SADAV)	April 1, 2018	3 years	Ansuman Banerjee
3	Testers for checking correctness of Samplers	April 1, 2019	3 years	Sourav Chakraborty
4	Model Centric Algorithms for Graph Theoretic, Clustering and Geometric Problems	April 1, 2019	3 years	Arijit Bishnu
5	Relay Selection in 5G Device to Device Communications under Uncontrolled Interference 5GD2D	April 1, 2019	3 years	Sasthi C. Ghosh

### Completed Projects: Internally funded

Sl. No	Name of the project	Starting Date	End Date	Principal Investigator(s)
1	Algorithms for Design Automation in next Generation Technologies (ADA)	April 1, 2017	Mar 31,2020	Susmita Sur Kolay
2	The Cops and robber game on graphs (COPROB)	April 1, 2017	Mar 31,2020	Sandip Das
3	Massive Data Algorithm - Phase II (MAD_ALGO)	April 1, 2017	Mar 31,2020	Subhas C. Nandy
4	Geometric Optimization Problem: (GOP)	April 1, 2017	Mar 31,2020	Sasanka Roy

### Ongoing Projects: Externally funded

Sl. No	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	An Assertion based verification framework for Model Driven Design flows	October 1, 2019	10 months	Ansuman Banerjee	Research Center Imarat (RCI), DRDO, Government of India
2	Automated Methods for implementing Robust and Secured Biochemical Assays with Microfluidic Lab-on-Chip	July 1, 2018	3 years	Ansuman Banerjee	Science and Engineering Research (SERB), Government of India
3	Design for Manufacturability aware Global Routing	2009		Susmita Sur-Kolay	IBM, USA
4	An Efficient Framework for Ensuring Security of FPGA-Based Environment	June 13, 2019	3 years	Susmita Sur-Kolay	SERB, New Delhi



## COMPUTER SCIENCE UNIT (CSU), CHENNAI

The research focus of the faculty members of the CS Unit (CSU) comprise mostly of theoretical and applied topics in Computer Science and allied areas like Cryptology, Computer Algebra, Graph Theory, Graph Algorithms, Logic, Game Theory, Behavioral Economics, Cognitive Science, Formal Linguistics. The faculty members of the unit taught in the PGDSMA programme conducted at the Chennai Centre, as well as in M.Tech.(CS) programme at ISI Kolkata.

### Current Area of Research

Name	Research topic(s)	Collaborators
Ayineedi Venkateswarlu	Construction of efficient MDS matrices	Abhishek Kesarwani (IIT Madras), Santanu Sarkar (IIT Madras)
	Unimodular polynomial matrices over finite fields	Akansa Arora (IIIT-Delhi), Samrith Ram (IIIT-Delhi)
Mathew C. Francis	Structures in high chromatic graphs	Manu Basavaraju (NIT Karnataka), L. Sunil Chandran (IISc Bengaluru)
	Domination problems in interval digraphs	Dalu Jacob (ISI)
	Linear arboricity conjecture for some special classes of graphs	Manu Basavaraju (NIT Karnataka), Drimit Pattanayak (ISI), Arijit Bishnu (ISI)
	The lexicographic method for the threshold cover problem	Dalu Jacob (ISI)
T. Karthick	Graphs Colorings	Maria Chudnovsky (Princeton University, USA)
		Shenwai Huang (Nankai University, China)
		Frederic Maffray (Univ. of Grenoble, France)
		Peter Maceli, USA
		S. A. Choudum (Christ University, Bengaluru)
		Jenny Kauffmann (Harvard University, UK)
Sujata Ghosh	Domination in Graphs	S. A. Choudum (Christ University, Bengaluru)
		Manoj Bellavadi (Christ University, Bengaluru)
	Formal Linguistics	Arka Banerjee, Samir Karmakar (Jadavpur University)
	Logic and algorithmic study of autistic behavior	Torben Braüner (Roskilde University, Denmark), Aishwarya Ghosh (ISI Chennai)
	Logics of strategies and preferences	R. Ramanujam (IMSc, Chennai)
	Negotiation training experiments	Aishwarya Ghosh (ISI Chennai), Rineke Verbrugge (University of Groningen, The Netherlands), Harmen de Weerd (Hanze University of Applied Sciences, The Netherlands)
Combining epistemic and hybrid logics	Katsuhiko Sano (Hokkaido University, Japan)	

### Projects

#### Ongoing Projects: Internally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Negotiating, one can learn: Developing a serious game	April 1, 2018	3 years	Sujata Ghosh

#### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator	Funding agency
1	Coloring of some special classes of graphs	March 8, 2019	3 years	T. Karthick	DST-SERB-MATRICES

# COMPUTER VISION AND PATTERN RECOGNITION UNIT (CVPRU), KOLKATA

The faculty members of this unit are actively engaged in research activities in various areas of Computer Science and Information Technology like Document Processing, Handwriting Analysis, Video Text Analysis, Information Retrieval, Sentiment Analysis, Natural Language Processing, Data Mining, Biometrics, Medical Image/Signal Processing, Machine Learning, Computer Vision etc. The faculty members of the unit are also engaged in teaching various courses of the degree programmes offered by the Institute.

## Current Area of Research

Name	Research topic(s)	Collaborators
Debapriyo Majumdar	Detection of sentiment and linguistic aspects in social media	
	Detection of harassment, bullying and supportiveness in conversations	
	Aspect based sentiment analysis in text reviews	
Mandar Mitra	Recommender system for bibliographic citations and illustrations	Dr. Dwaipayan Roy (IISER); Dr. Debasis Ganguly (IBM Ireland).
Sarbani Palit	Analysis of Astrophysical data	Arindam Mal (ISRO, Ahmedabad), Sisir Roy (National Institute of Advanced Studies, IISC Campus, Bengaluru)
	Cyclicality detection in geological data	Sarbani Patranobis-Deb (GSU)
	Image dehazing, restoration	Jessica El-Khoury (University of Bourgogne)
Ujjwal Bhattacharya	Pedestrian Detection and Pose estimation	P. S. R. Kishore, S. Das, P. S. Mukherjee
	Scene Text Spotting	K. Dasgupta, S. Das
	Privacy Preserving Machine Learning	P. S. R. Kishore, S. Das, P. S. Mukherjee
	End-to-end Handwriting Recognition	P. S. Mukherjee
	Degraded Document Analysis	Ayan Chaudhury
Umapada Pal	Sketch-based information retrieval	Josep Lladós (Computer Vision center, University Autònoma de Barcelona, Spain),
	Scene and video text detection	Tong Lu (Nanjing University China), P. Shivakumara (University of Malaya, Malaysia), Adel Alimi (Department of Computer Engineering and Applied Mathematics, University of Sfax, Tunisia).
	Document Processing	Michael Blumenstein (UTS, Australia)
	Pose estimation and medical image Analysis	Soumik Bhattacharya (IIT Kharagpur), Tapabrata Chakroborti (University of Oxford, UK)
	Handwriting recognition and biometrics	Yue Lu (ECNU, China), Partha Pratim Roy (IIT Roorkee), P. Shivakumara (University of Malaya, Malaysia); Michael Blumenstein (UTS, Australia), S. Chanda (Østfold University College, Norway)
Utpal Garain	Adversarial examples for deep systems and possible defense	Akshay Chaturvedi, Sourav Banerjee, Soumadeep Saha
	Explainable AI	Akshay Chaturvedi, Shahansha Salim
	Machine analysis for analysis of Psoriatic Plaque	Anabik Pal (NIH, US); Akshay Chaturvedi, aditi chandra, Raghunath Chatterjee, Swapan Senapati, Dermatologist; Alex Frangi (University of Leeds, UK), Adeti
	Understanding neural machine translation systems	Akshay Chaturvedi, Abhisek Chakrabarty (NICT, Japan), Masao Utiyama (NICT, Japan), Eiichiro Sumita (NICT, Japan)
	NLP for low resource languages	Abhisek Chakrabarty (NICT, Japan) Akshay Chaturvedi
	Adversarial attacks for vision systems	Akshay Chaturvedi, Omid Mohamad Nezami and Mark Dras (Macquarie University, Australia).

Name	Research topic(s)	Collaborators
	IoT analytics	Snehasis Banerjee and Tanushyam Chattopadhyay (TCS Innovation Lab).
	Machine recognition of handwritten, Math expression	Mahshad Mahdavi and Richard Zanibbi (Rochester Institute of Technology, USA), Harold Mouchère and Christian Viard-Gaudin (University of Nantes, France).

## Projects

### Ongoing Projects: Internally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Development of algorithms for cyclicity detection and analysis of geological records for paleoclimate reconstruction.	April 1, 2019	2 years	Sarbani Palit

### Completed Projects: Internally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Multi-lingual Word Spotting	April 1, 2017	3 years	Umapada Pal
2	Study Towards an End-to-End Online Handwriting Recognition System	April 1, 2017	3 years	Ujjwal Bhattacharya
3	DEER: Document Engineering based Envisioning of Reading Behaviour	April 1, 2017	3 years	Utpal Garain

# CRYPTOLOGY AND SECURITY RESEARCH UNIT (CSRU), KOLKATA

The CSRU engages in research in Cryptology and Information Security. Its faculty members are actively engaged in teaching in the M. Tech (CS) and M. Tech (CrS) programmes of the Institute. The unit also regularly arranges short term training programmes.

## Current Area of Research

Name	Research topic(s)	Collaborators
Anisur Rahaman Molla	Security in Distributed Computing/ Byzantine Computation	John Augustine (IIT Madras), Gopal Pandurangan (UoH, Texas, USA), Jared Saia (UNM, USA), Valerie King (UV, Canada)
	Mobile Agents/ Robotics	Debasish Pattanayak (RCBCCS, ISI), Kaushik Mondal (IIT Ropar), Ajay D. Kshemkalyani (UI, Chicago, USA), Gokarna Sharma (KSU, USA), William K. Moses Jr. (Technion, Israel)
	Distributed graph algorithms	Sourav Chakraborty (ACMU, ISI), Amitabh Trehan (UK), Gopal Pandurangan (UoH, Texas, USA), Reza Fathi (UoH, Texas, USA)
Debrup Chakraborty	Block Cipher Modes of Operations Secure and Efficient Implementations of Cryptographic Schemes	Palash Sarkar (ASU), Cuauhtemoc Mancillas Lopez (CINVESTAV IPN, Mexico)
Gautam K. Paul	Quantum Information / Computing / Cryptography:	
	Symmetric Cryptanalysis	Sugata Gangopadhyay (IIT Roorkee).
	Steganography	Imon Mukherjee (IIIT Kalyani), Nabanita Ganguly (JU), Sanjay Kumar Saha (JU)
Sushmita Ruj	Cloud Security	Shahzaib Tahir (City University, London), Muthukrishnan Rajarajan (City University, London), Srinivasan Narayananmurthy (NetApp Inc), Siddhartha Nandi (NetApp Inc)
	Blockchains	
	Network Security	Sipra Das Bit (IEST, Shibpur), Tanusree Chatterjee (IEST, Shibpur), Ranit Chatterjee (IEST, Shibpur), Jayasree Sengupta (IEST, Shibpur)

## Projects

### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding Agency
1	Distributed Computation in Dynamic Networks	October 1, 2016	5 years	Anisur Rahaman Molla	DST, Govt. of India
2	Cryptanalysis of Symmetric Cipher Algorithms	January 1, 2017	5 years	Goutam K. Paul	DAE, Govt. of India
3	Exploration of Suitable Metric for TRNG	September 5, 2019	2 years	Goutam K. Paul	DRDO

## DOCUMENTATION RESEARCH AND TRAINING CENTRE (DRTC), BENGALURU

This Centre was established as an integral part of the Indian Statistical Institute in 1962. Its primary objectives are to promote research and training in the areas of Library Science, Documentation and Information Science.

### Current Area of Research

Name of Faculty	Research topic(s)	Collaborators
Biswanath Dutta	Semantic Web, Network analysis	Animesh Dutta (NIT Durgapur)
	Knowledge representation, Metadata, Data Science	Clement Jonquet (Univ. of Montpellier, France)
Devika P. Madalli	Covid response: CURE Portal	
M. Krishnamurthy	Information Seeking Behaviour/ Social Media	Dong Geun Oh (Dept. of Library & Information Science, Keimyung University, Daegu, South Korea)

## ELECTRONICS AND COMMUNICATION SCIENCES UNIT (ECSU), KOLKATA

Electronics and Communication Sciences Unit (ECSU) is the oldest unit under the Computer and Communication Sciences Division (CCSD) of the Institute. The unit actively engages in the pursuit of state-of-the-art research encompassing areas like computer vision, advanced machine learning, image processing, computational intelligence, natural computing, information theory and atmospheric science. The faculty members take part in various Governmental and Industrial projects and consultancies focusing on real-life problems of national importance. It regularly organizes international conferences and workshops involving world-renowned researchers. Faculty members of the Unit have received many national and international awards in recognition of their research achievements. They also take part in teaching, training and research guidance. Apart from the eminent faculty members, the unit boasts of a vibrant team of junior and senior research fellows, project linked personnel, scientific and non-scientific workers whose contributions greatly enrich the achievements of the unit.

### Current Area of Research

Name	Research topic(s)	Collaborators
Bhabatosh Chanda	Image and Video Processing	
	Computer Vision	
	Mathematical Morphology	

Name	Research topic(s)	Collaborators
Dipti Prasad Mukherjee	Biomedical Image Processing	Jayanta Das (TATA Medical Centre, Kolkata)
	Industrial Image Processing	Itishree Mohanty, Avishek Kumar Tiwary (TATA Steel), Avishek Shaw (TCS)
	Sports Analytics using Computer Vision	Amlan Chakrabarty (Calcutta University)
Nikhil Ranjan Pal	Machine Learning, Neural Networks, Artificial Intelligence	Chin-Teng Lin, Jian Wang, Amar Kishor, Amit Singh
Partha Pratim Mohanta	Machine/Deep Learning, Neural Networks, Artificial Intelligence	Sayed Umer (Aliah University, India)
	Image and Video Processing	Sanjoy Kumar Saha (Jadavpur University, India)
	Computer Vision	Mrinmoy Ghorai (IIIT Sri City, India)
Swagatam Das	Clustering, Statistical Theory of Unsupervised Learning	Dr. Jason Xu (Duke University, USA)
	Class-imbalanced Learning, Data Irregularities	Francisco Herrera (University of Granada, Spain).
	Constrained and Multi-objective Evolutionary Algorithms	Vaclav Snasel (TU Ostrava, Czech Republic), Rammohan Mallipeddi (KNU, Korea)
	Deep Generative Models	

## Projects

### Ongoing Projects: Internally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Multiple Activity Recognition and Captioning in Unconstrained Video	April 1, 2018	3 years	Partha Pratim Mohanta

### Completed Projects: Internally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)
1	Ensemble Metaheuristic Approach for Real-World Combinatorial Optimization in the Framework of Travelling Thief Problem	April 1, 2017	March 31, 2020	Swagatam Das
2	Estimation of Ball Possession Statistics using Computer Vision	April 1, 2017	March 31, 2020	Dipti Prasad Mukherjee

## Projects

### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Information Access from Document Images of Indian languages	Dec 13, 2017	March 31, 2021	Bhabatosh Chanda	MHRD
2	Digital Restoration and reconstruction of Indian heritage Artifacts with focus on Murals, Manuscripts and Sculptures with Big data Technology	April 30, 2019	March 31, 2022	Bhabatosh Chanda	DST
3	Development of Automated Coal Petrography Phase I & II	January, 2018	March, 2021	Dipti Prasad Mukherjee	TATA Steel

### Completed Projects: Externally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Planogram Compliance Phase I & II	October, 2014	December, 2019	Dipti Prasad Mukherjee	TCS

# MACHINE INTELLIGENCE UNIT (MIU), KOLKATA

Machine intelligence attempts to make a machine behave like a human being, that is, it embodies the core concept of pattern recognition and machine learning with technologies like fuzzy logic, artificial neural networks, and evolutionary computing. Faculty members of this unit address these challenges and work in the areas of theory and applications of deep learning, under the Big Data platform. Applications include bioinformatics, personalized medicine, computer vision, medical image processing and network analysis, while the theoretical study involves developing novel deep neural network models with optimized architecture and appropriate learning algorithms for solving certain problems. Investigations are being carried out for the development of these technologies individually and in an integrated (hybridized) manner. They demonstrate their effectiveness in solving various problems of pattern recognition, machine learning, bioinformatics, systems biology, image and video analysis, computer vision, data and web mining, social network analysis, etc., related to the design of intelligent systems. Investigations are also being carried out in certain areas of web and social network mining, video image analysis and medial image analysis.

## Current Area of Research

Name	Research topic(s)	Collaborators
Ashish Ghosh	Machine learning, bioinformatics	Jonathan H. Chan (King Mongkut's University of Technology Thonburi, Thailand)
	Image processing	T. Veerakumar (National Institute of Technology, Goa)
	Video analysis	B. N. Subudhi (Indian Institute of Technology, Jammu)
	Evolutionary computation	S. Dehuri (F. M. University, Balasore, Odisha)
	Soft computing	S. B. Cho (Yonsei University, South Korea)
B. Uma Shankar	Land Cover classification of remotely sensed big data	Ashish Ghosh (MIU, ISI, Kolkata)
	Machine Learning based Global Terrestrial Gross Primary Productivity (GPP) Model Development using Satellite Driven Observation and Eddy Flux Covariance Data.	Ashish Ghosh (MIU, ISI, Kolkata), Bikash Ranjan Parida (Department of Geoinformatics, Central University of Jharkhand, Ranchi)
Kuntal Ghosh	Vision, Image Analysis and Perception	A. Bakshi, S. Neogi, R. Das, B. Uma Shankar, S. Banerjee, T. Chakraborty
	Complex Network Analysis	S. Chattopadhyay
Malay Bhattacharyya	Crowdsourcing	S. K. Mridha, S. Chatterjee, A. Mukhopadhyay
	Big Data Analysis	B. Sarkar
	Computational Biology	K. R. Chng, C. Li, D. Bertrand, A. H. Q. Ng, J. S. Kwah, H. M. Low, C. Tong, M. Natrajan, M. H. Zhang, L. Xu, K. K. K. Ko, E. X. P. Ho, T. V. Av-Shalom, J. W. P. Teo, C. C. Khor (MetaSUB Consortium), S. L. Chen, C. E. Mason, O. T. Ng, K. Marimuthu, B. Ang, N. Nagarajan
Pradipta Maji	Machine Learning and Pattern Recognition	Partha Garai (Kalyani Govt. Engg. College, WB)
	Deep Learning	
	Multiview Learning	
	Medical Imaging	Abhirup Banerjee (University of Oxford, UK), Shaswati Roy (RCCIT, WB)
	Bioinformatics	Sushmita Paul (IIT Jodhpur), Sudipto Saha (Bose Institute)
Rajat K. De	Control Theoretic Modeling of Biochemical Pathways for Exploring Insulin Sensitivity	Abhijit Dasgupta (University of Kalyani, Kalyani, West Bengal), Sushil K. Mahata (University of California, San Diego, California, USA), Nirmalya Chowdhury (Jadapur University, Kolkata)
	Multiomics Integration in Deep Neural Network Framework	Dibyendu Seal (University of Calcutta, Kolkata), Vivek Das (Novo Nordisk Research Center Seattle, Washington, USA), Saptarsi Goswami (Bangabasi Morning College, Kolkata)

Name	Research topic(s)	Collaborators
	Next Generation Sequence Analysis for Identifying Genome Variants under Big Data Framework	Rituparna Sinha (Heritage Institute of Technology, Kolkata), Rajat K. Pal (University of Calcutta, Kolkata)
	Prediction of Effector Proteins in Host-Pathogen Interactions	Somnath Tagore (Columbia University, New York, USA)
Sanghamitra Bandyopadhyay	Evolutionary Optimization	Sriparna Saha (IIT Patna)
	Multi-Objective Building Energy Management	Stephane Ploix (INP Grenoble, France)
	Bioinformatics and Computational Biology	Malay Bhattacharyya (MIU, ISI), Sumanta Ray (Aliah University), Ujjwal Maulik (Jadavpur University), Debarka Sengupta (IIIT Delhi)
Shubhra Sankar Ray	Gene expression analysis	S. Misra
Sushmita Mitra	Medical imaging	Lawrence O. Hall (USF Tampa, Florida, USA), Jayram K. Udupa (UPenn, Pennsylvania, USA)
	Bioinformatics	Vineet Baffna (UCSD, USA), Raghunath Chatterjee (HGU, ISI Kolkata)
	Data Science	
	Survival analysis	Lawrence O. Hall (USF Tampa, USA), Biswabrata Pradhan (ISI Kolkata)

## Projects

### Ongoing Projects: Internally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Distributed deep learning for multi-label classification	01.04.2018	3 years	Ashish Ghosh
2	Big Data Challenges in Biology: Algorithms for Single Cell Transcriptomic Analysis	April 1, 2019	3 years	Sanghamitra Bandyopadhyay
3	Three Timescale Modeling of Biochemical Pathways: Integration of Signaling, Gene Regulatory and Metabolic Pathways	April 1, 2019	3 years	Rajat K. De
4	Identifying various stages of cancer using miRNA Expressions	April 1, 2019	3 years	Shubhra Sankar Ray
5	Designing Feedback Mechanisms for Crowdsourcing Markets	August 1, 2019	3 years	Malay Bhattacharyya

### Completed Projects: Internally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)
1	Machine Learning for Cancer Management using Radio Images and Gene Expressions	April 01, 2017	March 31, 2020	Sushmita Mitra
2	Computational Methods to Integrate Microarray Data and Protein-Protein Interaction Networks for Disease Gene Identification	April 01, 2017	March 31, 2020	Pradipta Maji

### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Deep Learning for Handling Imbalance in Diabetic Retinopathy	November 01, 2018	3 years	Sushmita Mitra	Intel, USA
2	Hardware Trojan detection in PCBs using X-ray images	October 1, 2019	3 years	Ashish Ghosh	DRDO
3	Cluster project under data science research (a consortium of 23 projects from different Institutes in India)	April 2019	3 years	Ashish Ghosh	DST
4	Machine Learning in Data Science	April 2019	3 years	Ashish Ghosh	DST

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
5	Copula Functions in Analysis of Single Cell Gene Expression Data	2017	5 years	Sanghamitra Bandyopadhyay	JC Bose Fellowship Project, Department of Science and Technology (DST)
6	Multi-dimensional Research to Enable Systems Medicine: Acceleration Using a Cluster Approach	January, 2017	4 years	Sanghamitra Bandyopadhyay	Department of Biotechnology, Government of India
7	Visvesvaraya PhD Fellowship Scheme	March 1, 2016	5 years	Rajat K. De (Nodal Officer)	Digital India Corporation (Ministry of Electronics and Information Technology, Government of India)
8	Development of Computational Techniques to Integrate Multimodal, Multiscale Omics and Imaging Data for Cancer Diagnosis and Prognosis	May 1, 2016	5 Years	Pradipta Maji	Ministry of Electronics and Information Technology, Government of India
11	Synergy analysis of remote sensing modalities for environmental application	1st November, 2017	3 years	S Neogi (Mentor: K Ghosh)	Department of Science and Technology (WOS-A)

#### Completed Projects: Externally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)
1	Systems Medicine Cluster (SyMeC): Accelerating Systems Medicine using a Cluster Approach	2017	2020	Sanghamitra Bandyopadhyay Department of Biotechnology (DBT)

## SYSTEMS SCIENCE AND INFORMATICS UNIT (SSIU), BANGALORE

The Systems Science and Informatics Unit (SSIU) was started in 2009 for multidisciplinary research. Current faculty members of SSIU are working with phenomena and processes from certain (but different) domains such as brain function, terrestrial dynamics, sociological systems, urban and environmental systems etc. Study and analysis of such domain-specific research is done through computationally rigorous approaches, like signal processing, mathematical morphology and machine learning and also informatics. Broad areas of research include Computing in Interdisciplinary Science and Engineering to develop cogent domain-specific models. The broad research focus addresses challenges of both basic and applied nature. Goal is to conduct quality research involving advanced spatial statistical tools (e.g., mathematical morphology, fractal geometry, fuzzy set theory, rough set theory, neural networks, digital image processing and analysis, signal theory, game theory etc), and applications of such tools in various domains like geospatial, biology and medicine. Other areas of interest include spatial statistics, pattern retrieval, pattern analysis and modelling.

#### Current Area of Research

Name	Research topic(s)	Collaborators
B. Daya Sagar	Mathematical Morphology	Lorenzo Bruzzone (University of Trento, Italy ), Laurent Najman (University Paris-EST, France), Frits Agterberg (Canada Geological Survey, Canada), Qiuming Cheng (China University of Geosciences, China), Jennifer McKinley (Queen's University-Belfast, UK), Jocelyn Chanussot (University of Grenoble, France), Jon Benediktsson (University of Iceland, Iceland), K. Nagajothi (ISRO, India), Aditya Challa (IISc, India), Sravan Danda (BITS-Goa, India)

Name	Research topic(s)	Collaborators
	Spatial Data Sciences	K. Nagajothi (ISRO, India), Aditya Challa (IISc, India), Sravan Danda (BITS-Goa, India)
	Fractal Geometry	
	Mathematical Geosciences	
	Geographical Information Science	
Kaushik Kumar Majumdar	Neural signal and information processing	Puneet Dheer (PhD scholar, IIT Delhi), Kalyan Kumar Chowdhury (SQC Unit of ISI Bengaluru), John P. John (Department of Psychiatry, NIMHANS), Sanjib Sinha (Department of Neurology, NIMHANS), Sandipan Pati (Department of Neurology, University of Alabama at Birmingham, AL, USA)
	Brain function modeling	
Saroj K. Meher	Machine Learning	Prof. Ashok Pradhan (IIT Kharagpur), Prof. Shivaram Prasad Singh (Gastroenterology at SCB Medical College, Cuttack)
	Pattern Recognition	
	Remote Sensing data analysis	
	Computational Intelligence	

## Projects

### Ongoing Projects: Internally funded

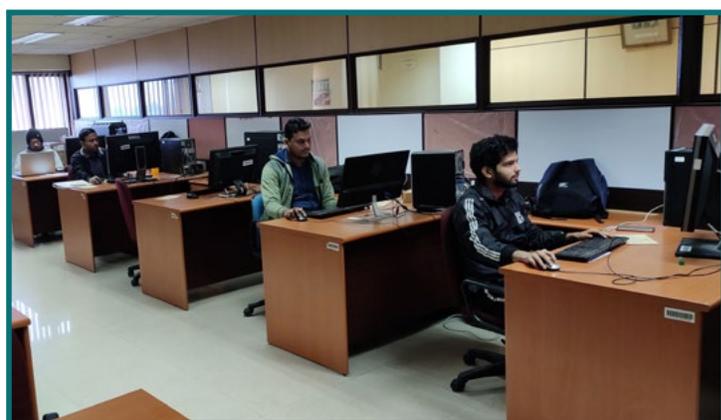
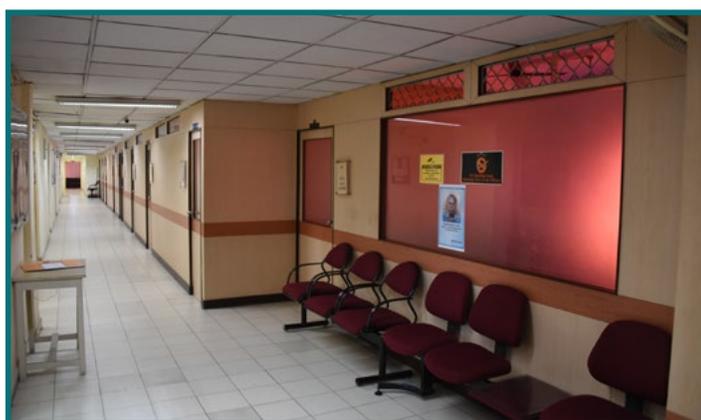
Sl. No	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Synchronization and desynchronization in seizure networks	April 1, 2018	3yrs	Kaushik Kumar Majumdar

### Ongoing Projects: Externally funded

Sl. No	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Analysis of Optical and Radar Remote Sensing Images for Dynamic Earth Process Monitoring	July 1, 2019	3yrs	B. S. Daya Sagar	ITPAR-IV: Govt. of India
2	An efficient measure of network synchronizability with applications	February 2, 2020	3yrs	Kaushik Kumar Majumdar	DST, SERB (MATRICS)

### Completed Projects: Externally funded

Sl. No	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Quantitative Morphologic and Scaling Analyses of Lunar Digital Elevation Models (LDEM) Derived from TMC Data of Chandrayaan-I Mission via Mathematical Morphology and Fractal Geometry	January 1, 2017	December 31, 2019	B. S. Daya Sagar	ISRO-Chandrayaan, Govt. of India





# PHYSICS AND EARTH SCIENCES DIVISION (PESD)

**Professor In-Charge:** PARTHASARATHI GHOSH, GSU Kolkata

**Office:** 2nd floor, Platinum Jubilee Building, ISI, Kolkata-700 108

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## 1. Geological Studies Unit (GSU), Kolkata

Head of Unit: DHURJATI PRASAD SENGUPTA

Number of Faculty: Nine (9)

Number of Research Scholars: Twelve (12)

Office: 2nd floor, Platinum Jubilee Building, ISI, Kolkata-700 108

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## 2. Physics and Applied Mathematics Unit (PAMU), Kolkata

Head of Unit: GURUPRASAD KAR

Number of Faculty: Ten (10)

Number of Research Scholars: Twenty-three (23)

Office: 7th floor, A.N. Kolmogorov Bhavan, ISI, Kolkata-700 108

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## 3. Theoretical and Applied Sciences Unit (TASU), North-East Centre, Tezpur

Head of Unit: KUNTAL GHOSH

Number of Faculty: Three (3)

Office: Punioni, Solmara, ISI, Tezpur, Assam- 784501

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# GEOLOGICAL STUDIES UNIT (GSU), KOLKATA

Faculty members of the Geological Studies Unit (GSU) carry out introductory exposition of Earth System Science to the B.Stat. students, supervise research students working for their Ph.D. degrees, conduct course work for Ph.D. students and train them to carry out extensive geological field work and data collection. Fieldwork is the mainstay of research activities of this Unit. At the same time, computational techniques are also used for geological modelling by numerical simulation and development of software to suit specific needs of the Unit's projects. At present, research work in the Unit is focused on several different aspects of Earth Science, like 1) Crustal Geodynamics 2) Evolution of Sedimentary Basins with their sedimentology, paleoclimate and depositional history 3) Phanerozoic Faunal Record as windows to Evolutionary and Developmental Paleobiology 4) Numerical analysis and modelling of geological data and geological systems.

## Current Areas of Research

Name	Research topic(s)	Collaborators
Amlan Banerjee	Geochemistry, Geology and Hydrogeology	Sarbani Patranabis Deb (GSU, ISI Kolkata)
	Archean greenstone belts of India -- tectonics and sedimentation. Oxygenation of Indian Proterozoic ocean	irosław Słowakiewicz (Polish Academy of Sciences)
Dhurjati P. Sengupta	Morphospace driven shape prospecting of Mesozoic fossil vertebrates from Gondwanas of peninsular India	Saswati Bandyopadhyay (GSU), Prof. Subhas Chandra Nandy (ACMU), Prof. Susmita Sur-Kolay (ACMU), Prof. Parthasarathi Ghosh (GSU), Dr. Josep Fortuny (Institut Catala de Paleontologia M. Crusafont, Z building, Universitat Autònoma de Barcelona, Cerdanyola del Valles, Barcelona, Spain), Dr. Dorota Konietzko-Meier (Department of Biosystematics, University Opole, Poland).
	Micro- and mega-vertebrate and palynological studies of Panchet formation, Damodar valley basin, India.	Geological Survey of India
Dilip Saha	Archean greenstone belts in India — tectonics and sedimentation	S. Patranabis-Deb; Amlan Banerjee; Priyanka Bachhar, G. K. Deb
Parthasarathi Ghosh	Paleoenvironment of Jurassic freshwater carbonates	
	Topology of drainage network	
Sarbani Patranabis Deb	Stratigraphy and tectonics of the Neoproterozoic cratonic basins of India	Dilip Saha (ISI Kolkata), Michiel Olivier De Kock (University of Johannesburg, SA)
Saswati Bandyopadhyay	Gondwana vertebrates of peninsular India: a new perspective from field collection and morphometric data	Dhurjati Sengupta
	Taxonomic revision of Geoemydid turtles from Siwalik foreland basin of India and Pakistan	Walter Joyce and Rafaella Garbin
	Phytosaur from the Late Triassic Tiki Formation, Rewa Gondwana basin	Sanghamitra Ray
	Reassessment of <i>Indochelys spatulata</i> from the Kota Formation of PG Gondwana basin and <i>Jainemys pisdurensis</i> from the Late Cretaceous Lameta Formation	Walter Joyce
Shiladri Sekhar Das	Diversity and palaeoecology of Jurassic gastropods from western India.	Sandip Saha (DST Inspire Fellow, ISI, Kolkata). Subhendu Bardhan (Retired Professor, Jadavpur University). Subhronil Mondal (IISER, Kolkata).
	Diversity and palaeoecology of Miocene gastropods from Kutch, western India.	Pritha Goswami (Durgapur Government College). Subhendu Bardhan (Retired Professor, Jadavpur University), Shubhabrata Paul (IIT, Kharagpur).
	Diversity and palaeoecology of Miocene gastropods from Dwarka basin, western India.	Subhendu Bardhan (Retired Professor, Jadavpur University), Subhronil Mondal (IISER, Kolkata).

Name	Research topic(s)	Collaborators
	A geometric morphometric approach to study Holocene naticid gastropod.	Subhronil Mondal (IISER, Kolkata). Sandip Saha (DST Inspire Fellow, ISI, Kolkata).
Tapan Chakraborty	Neogene sediments of Eastern Himalaya	Suchana Taral (IIT Kharagpur), Subir Bera (Calcutta University), Keyu Liu, (School of Geosciences, China University of Geosciences)
	Quaternary deposits of Eastern Himalayan Foreland Basin	Suchana Taral (IIT Kharagpur), Juraj Janocko (Technical University of Kosice, Slovakia), Marta Prekova
	Proterozoic aeolian sediments	Giorgio Basillici (University of Unicamp, Brazil)

## Projects

### Ongoing Projects: Internally Funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Gondwana vertebrates of peninsular India: a new perspective from field collection and morphometric data	April 1, 2018	3 years	Dhurjati Prasad Sengupta
2	Paleoenvironmental significance of freshwater carbonates in the Upper Gondwanas of India	April 1, 2019	3 years	Parthasarathi Ghosh
3	Neoproterozoic cratonic basins in southern India: Palaeoclimatic, palaeoenvironmental and palaeotectonic implications	April 1, 2019	3 years	Sarbani Patranabis-Deb
4	Paleogeography of the Neogene foreland basin of Eastern Himalaya and its relationship with contemporaneous sediments of Mizoram	April 1, 2018	3 years	Tapan Chakraborty

### Completed Projects: Internally Funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Archean greenstone belts in India — tectonics and sedimentation	April 1, 2016	March 31, 2020	Dilip Saha
2	Diversity, palaeobiogeography and palaeoecology of Miocene gastropods from India with special emphasis on Kutch, Gujarat.	April 1, 2017	March 31, 2020	Shiladri Shekhar Das

### Ongoing Projects: Externally Funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator	Funding agency
1	Systematics, Palaeobiogeography and change in diversity of Tertiary Gastropoda of Kutch, Gujarat.	October 12, 2018	3 Years	Shiladri Shekhar Das	SERB, DST, Govt. of India

## PHYSICS AND APPLIED MATHEMATICS UNIT (PAMU), KOLKATA

The main areas of research in the Physics & Applied Mathematics Unit (PAMU) are Theoretical Physics and various areas related to Applied Mathematics. Additionally, some experimental work is also being done in the Fluvial Mechanics Laboratory of this Unit. The Scientists of the Unit have been working in the areas of Cosmology and Astroparticle Physics along with Data analysis, Condensed Matter Physics and Nano-electronics, High Energy Physics, Quantum Field Theory, Foundation of Quantum Mechanics, Quantum Information Theory, Quantum Thermodynamics, Nonlinear Dynamical Systems, Complex Networks, Physics of complex systems, Sediment-fluid interactions and Flow Visualization. Apart from research activities, scientists of this Unit are engaged in teaching various courses of some degree programmes of the Institute and conducting Ph. D. course work as well as supervising research fellows towards their Ph. D. degrees.

## Current Areas of Research

Name	Research topic(s)	Collaborators
Dibakar Ghosh	Nonlinear Dynamics, Complex dynamical networks, Extreme events, Machine Learning, First-passage resetting	Juergen Kurths (Potsdam, Germany), Matjaz Perc (University of Maribor, Slovenia), Erik Bollt (Clarkson University, NY), Syamal K. Dana (Jadavpur University, Kolkata)
Banasri Basu	Theoretical Condensed Matter Physics: Transport Properties of Quantum Materials, Interdisciplinary: Physics of Complex system	Anirudha Menon, Tanay Nag and Abhik Ghosh
Santanu K. Maiti	Thermoelectric study for efficient energy conversion, Spintronics in magnetic helix structure, Topological states and localization phenomena, Transport properties in presence of irradiation, Transport phenomena in interacting quantum systems, Spectral properties of phononic quasicrystals	M. Patra, M. Saha, S. Roy, S. Chakraborty, J. Majhi, S. Sarkar, A. Koley, D. Das Gupta, R. Bhattacharya, S. Sil (Visva-Bharati University), M. Dey (Adamas University), K. Wakabayashi (Kwansei Gakuin University, Japan).
Guruprasad Kar	Quantum Foundation and Quantum Information theory: Using quantum switch in quantum communication	Sutapa Saha (ISI), Dr. Mank Banik (IISER Thribandam), Dr Some sankar Bhattacharya (Hongkong), Prof. Sibasish Ghosh (IMSC, Chennai), Dr. Ramij Rahaman (Presidency University)
Preeti Parashar	Quantum Thermodynamics	Tamal Guha, Mir Alimuddin, Anandamoy Das Bhowmik
Sankar Sarkar	Three-dimensional turbulence characteristics over a bimodal water-worked gravel-bed	Subhasish Dey, IIT Kharagpur
Supratik Pal	Cosmology and Astroparticle Physics	Tony Pinhero, Abhishek Naskar, Ayan Mitra, Barun Kumar Pal, Ujjaini Alam, Archita Bhattacharyya, Subinoy Das, Kanhaiya Lal Pandey, Arindam Chatterjee, Arnab Paul, Anish Ghoshal, Soumendra Kishore Roy, Pratyusava Baral,
Subir Ghosh	Extension of work on analogue Hawking effect in metamaterial-dielectric composite, Conastruction of non-abelian Anyon model, Study of effects of non-trivial ground state in General theory of relativity, Black hole entanglement entropy.	Avijit Bera, Bibhas Ranjan Majhi, Weiqiang Yang, Supriya Pan, Andronikos Paliathanasis, Yabo Wu, Joydeep Majhi
Barnana Roy	Nonlinearity in parity-time symmetric system	Naresh Saha, David J. and Fernandez C

## Projects

### Ongoing Projects: Internally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Three-dimensional turbulence characteristics over a bimodal water-worked gravel-bed	April 1, 2019	March 31, 2022	Sankar Sarkar

### Completed Projects: Internally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)
1	Urbanization and Scaling	December 15, 2019	March 31, 2020	Banasri Basu

### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Emergence of coherent structures in brain neural network during sensory information processing experiment and theoretical analysis	January 21, 2020	24 Months	Dibakar Ghosh	SERB-DST, Government of India and Russian Foundation for Basic Research (RFBR)
2	Quantum transport in meso-scale and nanoscale systems: open problems and challenges	December 19, 2018	36 Months	Santanu K. Maiti	SERB-DST, Government of India
3	Spatiotemporal propagation of signals in complex networks	May 02, 2018	60 Months	Chittaranjan Hens	DST, Government of India

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
4	Inspire Faculty Award	September 24, 2018	60 Months	Abhishek Majhi	DST, Government of India
5	Unravelling the Inter-disciplinary facts of Physics and Data Sciences in real life socio-economic challenges	February 24, 2020	36 Months	Banasri Basu	SERB (Science and Engineering Research Board), Govt. of India

#### Completed Projects: Externally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Macroscopic dynamics in ensembles of dynamical systems: some challenging issues	March 28, 2017	36 Months	Dibakar Ghosh	SERB-DST, Government of India
2	Quest for Dark Matter and Inflation	October 30, 2015	48 Months	Arindam Chatterjee	DST, Government of India
3	Some current quantum mechanical problems in linear and nonlinear quantum systems	September 16, 2016	36 Months	Anjana Sinha	DST (Department of Science and Technology), Government of India

## THEORETICAL AND APPLIED SCIENCES UNIT (TASU), TEZPUR

The Theoretical and Applied Sciences Unit (TASU) at the North-East (NE) Centre of the Institute was established in August 2018. The goal of the Unit is to pursue research in basic theoretical sciences and emerging interdisciplinary and multidisciplinary areas. The Unit aims to complement research and development on Sustainable Development Goals, in line with the ongoing work of MoSPI towards monitoring progress on the environmental indicators. The research topics of this Centre include: Crop health and structural change monitoring using satellite imagery in Tezpur, Assam, Change detection around Kaziranga National Park, Effect of Lockdown for COVID-19 on vegetation health and environmental parameters; Singularity Theory, Lipschitz Geometry of Smooth Mappings, O-minimal Structures, Stratifications; Air quality and exposure assessment, Source apportionment, risk assessment and study of fate of polycyclic aromatic hydrocarbons (PAHs) in the atmosphere, Retrieval of the historical atmospheric levels (~150 years) of black carbon using lake sediments, Particulate matter removal by forest cover. Five scientific papers were published in journals, one in conference proceedings.

#### Current Area of Research

Name of Faculty	Research topic(s)	Collaborators
Sanjit Maitra	Crop health and structural change monitoring using satellite imagery in Tezpur, Assam	
	Change detection around Kaziranga National Park	Kuntal Ghosh (ISI Kolkata), Srutiparna Neogi (IIIT Kalyani)
	Effect of Lockdown for COVID-19 on vegetation health and environmental parameters	
Saurabh Trivedi	Singularity Theory, Lipschitz Geometry of Smooth Mappings	Maria Aparecida Soares Ruas (University of Sao Paulo, Brazil), Xuan Viet Nhan Nguyen (Basque Center for Applied Mathematics, Spain)
	O-minimal Structures, Stratifications	David Trotman (Aix-Marseille University, France)
Darpa Saurav Jyethi	Air quality and exposure assessment	
	Source apportionment, risk assessment and study of fate of polycyclic aromatic hydrocarbons (PAHs) in the atmosphere	Pandit Sudan Khillare (JNU New Delhi, India)
	Retrieval of the historical atmospheric levels (~150 years) of black carbon using lake sediments	Liaquat Husian and Vincent Dutkiewicz (SUNY Albany, USA)
	Particulate matter removal by forest cover	Sanjit Maitra, Kushal Banik Chowdhury (ISI Tezpur, Assam, India)





# SOCIAL SCIENCES DIVISION (SSD)

**Professor In-Charge:** E. SOMANATHAN, EPU Delhi  
**Office:** 7, S.J.S. Sansanwal Marg, ISI, New Delhi- 110 016

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## 1. Economic Analysis Unit (EAU), Bengaluru

Head of Unit: MADHURA SWAMINATHAN  
Number of Faculty: Two (2)  
Number of Research Scholars: Eight (8)  
Office: 8th Mile, Mysore Road, ISI, Bengaluru- 560 059

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## 2. Economic Research Unit (ERU), Kolkata

Head of Unit: TARUN KABIRAJ  
Number of Faculty: Thirteen (13)  
Number of Research Scholars: Twelve (12)  
Office: 6th floor, S.N. Bose Bhavan, ISI, Kolkata-700 108

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## 3. Economics and Planning Unit (EPU), Delhi

Head of Unit: TRIDIP RAY (till January 2020)  
DEBASIS MISHRA (February 2020 onwards)  
Number of Faculty: Eleven (11)  
Number of Research Scholars: Thirty-one (31)  
Office: 7, S.J.S. Sansanwal Marg, ISI, New Delhi- 110 016

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## 4. Linguistic Research Unit (LRU), Kolkata

Head of Unit: NILADRI SEKHAR DASH  
Number of Faculty: One (1)  
Number of Research Scholars: Two (2)  
Office: Ground floor, R. A. Fisher Bhavan, ISI, Kolkata-700 108

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## 5. Population Studies Unit (PSU), Kolkata

Head of Unit: PRASANTA PATHAK  
Number of Faculty: One (1)  
Office: 5th floor, R. A. Fisher Bhavan, ISI, Kolkata-700 108

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## 6. Psychology Research Unit (PRU), Kolkata

Head of Unit: DEBDULAL DUTTA ROY  
Number of Faculty: Two (2)  
Number of Research Scholars: Two (2)  
Office: 7th floor, Platinum Jubilee Building, ISI, Kolkata-700 108

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## 7. Sampling and Official Statistics Unit (SOSU), Kolkata

Head of Unit: NACHIKETA CHATTOPADHYAY  
Number of Faculty: Four (4)  
Office: 3rd floor, C.D. Deshmukh Bhavan, ISI, Kolkata-700 108

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## 8. Socio-Economic Research Unit (SERU), North-East Centre, Tezpur

Head of Unit: GOUTAM MUKHERJEE  
Number of Faculty: Two (2)  
Office: Punioni, Solmara, ISI, Tezpur, Assam- 784501

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## 9. Sociological Research Unit (SRU), Giridih & Kolkata

Head of Unit: TARUN KABIRAJ  
Number of Faculty: One (1)  
Number of Research Scholars: One (1)  
Giridih Office: New Barganda, ISI, Giridih, Jharkhand- 815 301  
Kolkata Office: 5th floor, R. A. Fisher Bhavan, ISI, Kolkata-700 108

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## ECONOMIC ANALYSIS UNIT (EAU), BENGALURU

The Economic Analysis Unit in Bengaluru was set up in 1985; it has always been small, with three faculty members for most of this decade. From 2015, a new JRF programme in development studies was started to encourage empirical analysis of contemporary development problems. The faculty have taught courses for Ph. D students, as required, and also regularly offer electives in Economics for the B. Math. students.

An important part of our research has been evaluation of official statistics on the rural economy. Another contribution has been through undertaking village studies and understanding the role of village studies in complementing available secondary information on rural India. We evaluated the gender gap in official statistics in relation to rural workers, miners and plantation workers, and pointed out implications for data collection and policy. Faculty have engaged on various activities with the Government of India, and the Governments of Karnataka, Kerala, Chhattisgarh, and Tripura.

### Current Area of Research

Name	Research topic(s)	Collaborators
Madhura Swaminathan	Price volatility of perishable crops	A.R.Durga (Tamil Nadu Agricultural University)
	Rural women workers and drudgery: evidence from time use surveys in Indian villages	
Molly Chattopadhyay	Research on Official Statistics regarding Women's Labour in India.	
H. M. Rajashekara	Computational Spatial Social Science, Geographic Information Science (GIS) & Remote Sensing, Open Source Information Technology.	

### Projects

#### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
I	Price Stability of key Agricultural Crops	June, 2018	July, 2020 (end date)	Madhura Swaminathan and Molly Chattopadhyay	Ministry of Agriculture and MSSRF, Chennai

## ECONOMIC RESEARCH UNIT (ERU), KOLKATA

The Scientific workers of the Economic Research Unit are involved in various research activities (theoretical and applied), teaching, research supervision, administrative and other activities of the institute. Broad areas of research are: Econometrics, Time Series Analysis, Empirical Studies, Game Theory, Mechanism Design, Auction Theory, Industrial Organization Economics Development, National Income and Growth, Economic Inequality and Poverty, Political Economy, Macroeconomic Issues, International Trade, Women Empowerment and Gender Economics, Conflict Economics, Terrorism, Individual and Collective Choice, Agriculture and Credit Market, Financial Economics, Experimental Economics, Public Economics, Education and Child Health, R & D, Licensing and Joint Ventures, etc.

### Current Area of Research

Name	Research topic(s)	Collaborators
Brati Sankar Chakraborty	Unemployment and Trade Policy	
Chaiti Sharma Biswas	Women Empowerment, Violence against Women and Gender Violence, Social Security of Women, Quality of Life of Women	
Indraneel Dasgupta	Economics of Untouchability and Caste Conflict	
Manash Ranjan Gupta	Development and Economic Growth	

Name	Research topic(s)	Collaborators
Manipushpak Mitra	Budget Balanced VCG Mechanisms for Sequencing Problems	Youngsub Chun and Suresh Mutuswami
	Prior-free Online Mechanisms for Queueing with Arrivals	Sambuddha Ghosh and Yan Long
	Equilibrium Co-existence of Public and Private Firms and the Plausibility of Price Competition	Rupayan Pal, Arindam Paul and P. M. Sharada.,
Nityananda Sarkar	Time Series Modelling of COVID-19 Data	Kushal Banik Chowdhury, ISI NE Centre, Tezpur)
	Study of Some Aspects of Health Economics in India Using NFHS -4 Data	Debabrata Mukhopadhyay (West Bengal State University, Barasat)
	The Issue of Child Mortality in South Asian Countries	Debabrata Mukhopadhyay (West Bengal State University, Barasat)
	Study of Investors' Commitment Towards Climate Change in India	Debabrata Mukhopadhyay (West Bengal State University, Barasat)
Samarjit Das	Panel Data Models under Cross-sectional Dependence	
Saswati Das	Inequalities on child well-being in South Asia	H. Goswami (Manchester Metropolitan University, UK)
	Child education and parentally provided inputs	
	Measuring child disadvantage in India	D. Mukherjee (SOSU)
	Phase-wise impact of MGNREGA on livelihood security of rural people	
Soumyanetra Munshi	Jaw-jaw and war-war: A Game-theoretic Exploration of Violence in Electoral Politics	
Souvik Roy	Separability and Decomposability in Mechanism Design with Transfers Decision Theory	
Tarun Kabiraj	When Spillovers Enhance R&D Incentives	Rittwik Chatterjee (Centre for Study Social Sciences, Kolkata), Srobonti Chattopadhyay (Vidyasagar Women College, Kolkata)
	On the Choice of R&D Organization	Abhishek Kabiraj
	Counter-terrorism Policy: Offence vs. Defence	
	Sponsorship and Terrorist Behavior: some Implications for Counter-terrorism Policy	
	International Joint Ventures in Developing Countries	Arijit Mukherjee

## Projects

### Completed Projects: Internally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)
I	Lecture-cum-workshop series on advances in economic theory and applications: 2017-18 to 2019-2020	April 1, 2019	March 31, 2020	Indraneel Dasgupta, Soumyanetra Munshi and Souvik Roy

### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
I	Children's World: International Survey on Children's Well-being.	April 1, 2019	Two years	Saswati Das	Jacobs Foundation

### Completed Projects: Projects for Govt of India

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
I	Deception and Its Detection with Particular and General Targets	May 17, 2019	March 31, 2020	Priyadarshi Banerjee	Government of India

# ECONOMICS AND PLANNING UNIT (EPU), DELHI

The Economics and Planning Unit faculty continues to work on the cutting edge of economic research, both in theory, as well as empirical analysis.

## Current Area of Research

Name	Research topic(s)	Collaborators
Abhiroop Mukhopadhyay	The impact of teacher transfer policies on student learning outcomes: Haryana	Aparajita Dasgupta (Ashoka University, India), Anugula Reddy (NIEPA, India)
	The economic returns to studying Science in High Schools	Tarun Jain (IIMA, India), Nishith Prakash (University of Connecticut, USA) and Raghav Rakesh (Michigan State University, USA)
	Try thy Neighbour: Impact of Partition on Social Capital	Prasad Bhattacharya (Deakin University, Australia), Latika Chaudhary (Naval Post Graduate School, USA)
	School Expansion and Caste Composition in an Ethnically Diverse Society	Chandan Jain (3ie, India), Anugula Reddy (NIEPA, India)
	The Dynamic of Spatial Inequality in India	David Garcés Urzainqui (LSE, UK)
	STEM Institutes and High School Science Choice	Sanjana Gupta (North Western University, USA), Nishith Prakash (University of Connecticut, USA)
Arunava Sen	Matching Theory	Antonio Nicolo (University of Padova, Italy), Sonal Yadav (University of Umea, Sweden)
	Mechanism Design Theory	Saptarshi Mukherjee (IIT, Delhi), Nozomu Muoto (Yokohama University, Japan)
	Social Choice Theory	Debasis Mishra (EPU, ISI Delhi)
	Stable Mechanism Design	Rajiv Vohra (Brown University, USA), Debasis Mishra (EPU, ISI Delhi)
Chetan Ghate	Emerging Market Business Cycles	Chetan Dave (U. of Alberta), Pawan Gopalakrishnan (RBI), Suchismita Tarafdar (Shiv Nadar University), Debulal Mallick (Deakin U)
	Heterogeneous NK DSGE Models	
	Public Debt in India	Piyali Das (IIM Indore)
	Monetary Policy Frameworks	
Debasis Mishra	Multidimensional Mechanism Design	Sushil Bikhchandani (University of California, Los Angeles)
	Social Choice Theory	Arunava Sen (EPU, ISI Delhi)
	Stable Mechanism Design	Rajiv Vohra (Brown University, USA) and Arunava Sen (EPU, ISI Delhi)
E. Somanathan	Study to understand whether anti- depredation squads reduce human elephant conflict in Assam	Nitin Sekar (WWF, India)
	The Impact of Temperature on Productivity and Labor Supply: Evidence from Indian Manufacturing	Rohini Somanathan (Delhi School of Economics), Anant Sudarshan (University of Chicago) and Meenu Tewari (University of North Carolina)
	Community Managed Forest Groups and Preferences for REDD+ Contract Attributes: A Choice Experiment Survey of Communities in Nepal	M. Dissanayake (Portland State University), Bhim Adhikari ( University of Maryland School of Medicine), Rajesh Bista (University of North Carolina), Randall Bluffstone (Portland State University), Harisharan Luintel (Algoma University), Peter Martinsson (University of Gothenburg), Naya Sharma Paudel (ForestAction Nepal) and Michael Toman (World Bank)
Farzana Afridi	A Breath of Fresh Air: Raising Awareness for Clean Fuel Adoption	

Name	Research topic(s)	Collaborators
Kanishka Kacker	The Ties that Bind Us: Social Networks and Productivity in the Factory	
	Hunger and Performance in the Classroom	
	Coal Plant Emissions and PM 2.5 Concentration	E. Somanathan (EPU, ISI Delhi), S. Dey (IIT Delhi) and R. Choudhary (World Bank Delhi)
	Inter-Regional Coal Mine Competition in the US: Evidence from Rail Restrictions	I. Lange (Colorado School of Mines)
	Better Than Most: Teacher Beliefs about Effort and Ability in Uganda	S. Sabarwal (World Bank Washington DC) and J. Habyarimana (Georgetown University)
Monisankar Bishnu	Social Transfers and Labor Supply	
	Intergenerational Transfers, Pension, Education, Endogenous fertility, Optimal taxes	Amol (U Minnesota), Shresth Garg (Harvard), Tishara Garg (MIT), Nick Guo (Wheaton College), Cagri Kumru (Australian National University), Tridip Ray (EPU, ISI Delhi)
	Labor force participation in India, Mechanization	Farzana Afridi, (EPU, ISI Delhi), Kanika Mahajan (Ashoka University)
Mudit Kapoor	Macro - behavioral issues, Credit market	Joydeep Bhattacharya (Iowa State University), Min Wang (Peking University)
	Health economics (Prevalence of low birth weight in India, Seasonality in nutritional outcomes)	UNICEF
	Decomposition of neonatal mortality between the rich and poor	
Prabal Roy Chowdhury	Prediction of early neonatal sepsis	AIIMS
	The association between exposure to open biomass burning and hypertension prevalence in North India	
	Honesty over Talent in Project Implementation with Possibility of Backstabbing	Parimal Bag (National University of Singapore)
	Favoritism in Promotion in Teams	Parimal Bag (National University of Singapore) Neelanjana Datta (Cornell University)
	Natural Shocks and Marriage Markets:	Shyamal Chowdhury (Sydney University), Debdulal Mallick (Deakin University)
	Evolution of Mehr and Dowry in Muslim Marriages	
Effect of Ceiling Size on Land Acquisition and Capital Investment- Evidence from Indian States		
Tridip Ray	Mixed Markets, Congestion and Competition	Arghya Ghosh (University of New South Wales)
	Multi-region Carbon Taxes under Time Inconsistency	Monisankar Bishnu (EPU, ISI Delhi)
	Education and Fertility: Pension System and its Phase Out	
	Intergenerational State Education and Pension with Endogenous Fertility	
	Optimal Intergenerational Transfers and the Rise and Fall of Pay-As-You-Go Pensions	
	Changing Structure of the Labour Market in India: Job Polarization and Informalization	Arka Roy Chaudhuri (Shiv Nadar University)
	Gendered Stream Choice in India	

## Projects

### Ongoing Projects: Internally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Emerging Market Business Cycles	June, 2016		Chetan Ghate
2	Heterogeneous NK DSGE Models	August, 2017		Chetan Ghate
3	Public Debt in India	June, 2018		Chetan Ghate
4	Monetary Policy Frameworks	February, 2020		Chetan Ghate
5	Role Model Effects in Stream Choice, PPRU	April, 2018	3 Years	Tridip Ray
6	Changing Structure of the Labour Market in India: Job Polarization and Informalization, PPRU	April, 2018	3 Years	Tridip Ray
7	Analyzing Bid Trends in Solar Auctions in India	January, 2020		E. Somanathan

### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Analysis for CNNS Data Quality, Seasonality in Nutrition indicators and Trends Analysis based on CNNS and NFHS data	01/05/ 2019	19 Months	Mudit Kapoor	UNICEF
2	Impacts of electric stoves on air pollution and women's welfare in rural India	09/01/2017	40 Months	E. Somanathan	Environment for Development Initiatives (EfD), Sweden
3	Field study of relation between paddy residue burning and severe air pollution	04/11/2018	32 Months	E. Somanathan	The Nature Conservancy, USA
4	The Causes and Consequences of Traffic Congestion in India	Mar-19	21 Months	Kanishka Kacker	Environment for Development Initiative (Efd)
5	Nudging households to increase the usage of clean fuel	15/05/2018	27 Months	Farzana Afridi	IWWAGE_IFMR

## LINGUISTIC RESEARCH UNIT (LRU), KOLKATA

The Linguistic Research Unit (LRU) is engaged in research activities in areas related to Corpus Linguistics, Language Technology, Computational Lexicography, Language Documentation & Digitization, Language Teaching, Digital Humanities, Cognitive Linguistics, Clinical Linguistics, and Descriptive Linguistics.

### Current Area of Research

Name of Faculty	Research topic(s)	Collaborators	
Niladri Sekhar Dash	POS Tagged Bangla Text Corpus Generation		
	POS Tagged Corpus of Indian English Newspaper Texts		
	Corpus-Based English Language Teaching (C-BELT) System		
	Lexical Database of English-Bangla Translational Equivalents,		
	Digitization of Charyagiti Padavali as a part of Digital Humanities		
	Nature of Bilingual Dementia of Patients with Broca's Aphasia,		Arpita Bose (CeLM, University of Reading, UK)
	Analysis and Annotation of Prefixed Bangla Words.		

## Projects

### Ongoing Projects: Internally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)
I	POS Tagged Bangla Text Corpus Generation	April 1, 2018	3 Years	Niladri Sekhar Dash

## POPULATION STUDIES UNIT (PSU), KOLKATA

The areas in which the Unit has done extensive research are determinants of mother and child health, determinants of neonatal mortality, socio-economic determinants of maternal and child health care services, inequality in health of under 5 children, inequality in maternal and child health care utilisation, regional disparity in health, projection for Covid -19, variation in contraceptive practices, projection of population, effect of malnutrition on child health and Indian statistical system. The Unit has also participated in teaching B.Stat. and ISEC Courses. The members of the Unit published papers in journals and books, and also participated as resource persons in national and international seminars, conferences and workshops.

### Current Area of Research

Name	Research topic(s)
Prasanta Pathak	Statistical investigation into the determinants of neonatal mortality in the EAG & non-EAG states in India: evidences from NFHS-4
	Statistical investigation into the variation in uses of various contraceptive methods in rural Bihar, Rajasthan and Tamilnadu by age and economic status and its effect on children ever born: evidences from NFHS-4
	Statistical investigation into the determinants of mother and child health: evidences from NFHS-4
	Statistical projections of confirmed cases, recoveries and deaths due to COVID-19 in eleven predominantly affected states in India
Subhash Barman	Inequality in health status of the under-5 children in India
	Regional disparity in health status of population across the states in India
	Socioeconomic determinants of maternal and child healthcare services in India: Role of women's education and autonomy
Partha De	Indian Statistical System - A Journey from ancient period to Modern Age
	Developmental Outcome in Children in absence of proper nutrition
	Indian Census data and its use in population projections using cohort survival method

## PSYCHOLOGY RESEARCH UNIT (PRU), KOLKATA

Faculty members of this Unit are engaged in teaching, research, training and consultancy. Faculty members also train students of other universities and research institutes on exploratory data analysis, data discretization, categorical data structuring, psychometric counselling through short term courses.

### Current Area of Research

Name	Research topic(s)
Debdulal Dutta Roy	Pro Environmental Attitude Survey item construction
	A study on Meta Memory and Working Memory among school going adolescents.
	Item Construction for Measuring Environmental Safety, Perceived Control and Environmental Reductionism Attitude of College Going Students
	Item Construction for Measuring Environmental Cleanliness and Reuse Attitudes of College going Students
	Item Construction for Measuring Environmental Sensitivity and Recycling
	Cross-Cultural Study of Pro-Environmental Attitude of College Students of India and Bangladesh
	A Study on Visuospatial reasoning abilities and Working Memory across ages.

Name	Research topic(s)
	Job Stress and Organizational Role Stress of Nurses in Different Wards of one Govt. Hospital in Kolkata.
	Job Stress and Organizational Role Stress of Nurses having different works experience of one Govt. Hospital in Kolkata
	Job Stress of nurses in Critical Care Units and Different Wards
	An Exploratory Study on the complaints and symptom severity of Schizophrenic patients.
	Development of Diabetes Self-care Efficacy Scale.
	K-means cluster of personality in predicting Self-care Activity in Diabetes Mellitus: A cross sectional study.
	Construction of test battery measuring Visuo spatial reasoning.
Garga Chatterjee	A Study on Perceived Facial Attractiveness of Young Adults.
	South Asian Face database.
	Effect of Internet usage on brain structure.
	Studying the phenomenon of disgust with reference to genetic contribution using twins.
	Human face and body skin tone and their relationship with various biological and social parameters.

## Projects

### Ongoing Projects: Internally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Pro-Environmental Attitude Survey	April 1,2019	3 years	Dulal Dutta Roy
2	Development of Face Recognition Test	April 1,2018	3 years	Garga Chatterjee

# SAMPLING AND OFFICIAL STATISTICS UNIT (SOSU), KOLKATA

This unit has conducted several projects for the Government of India (NSSO, NSSTA, Ministry of Coal, Ministry of Commerce), training programmes for Government Officers (National: IIT, IIM)) and International Collaborations (Stat Netherlands), Policy Research, and MOU with LBSNAA.

### Current Areas of Research

Name	Research topic(s)	Collaborators
Diganta Mukherjee	Mathematical Finance	Subhojit Biswas, Mrinal K. Ghosh
	NSS CE data	Probir Chaudhuri
Kajal Dihidar	Privacy protection measures for some alternative randomized response models in estimating population mean of stigmatizing continuous variables.	
Nachiketa Chattopadhyay	Socio-Economic Mobility; Nutrition, Poverty and Health	Satya R Chakravarty, Asit Baran Chakraborty
	National Coal Index	Debasis Sengupta
Sandip Mitra	Sex workers, Stigma and Self-Image: Evidence from Kolkata Brothels	Sayantana Ghosal (Glasgow University), Anandi Mani (Oxford University), Smarajit Jana (Durbar), Sanchari Roy (Kings' College, London)
	Decentralized Targeting of Agricultural Credit Programs	Dilip Mookherjee (Boston University), Pushkar Maitra (Monash University, Australia), Sujata Visaria (Hong Kong University of Technology)
	Moral reputation and political selection in a decentralized democracy	Kunal Sen (United Nations University), Prasenjit Banerjee (Manchester University), Antonio Niccolò (University of Padova, Italy), Vegard Iversen (University of Greenwich, UK)

Name	Research topic(s)	Collaborators
	Promise and politicians in an uncertain world: Evidence from a lab-in-the-field experiment	Kunal Sen (United Nations University), Prasenjit Banerjee (Manchester University), Antonio Niccolò (University of Padova, Italy), Vegard Iversen (University of Greenwich, UK)
	Distributive Impacts of Agent-Intermediated Microcredit	Dilip Mookherjee (Boston University), Pushkar Maitra (Monash University, Australia), Sujata Visaria (Hong Kong University of Technology)
	How Do Voters Respond to Welfare vis-à-vis Public Good Programs? An Empirical Test for Clientelism	Pranab Bardhan (University of California, Berkeley), Dilip Mookherjee (Boston University), Anusha Nath (Federal Reserve Bank of Minneapolis)
	Long Term impact of Microfinance	Dilip Mookherjee (Boston University), Pushkar Maitra (Monash University, Australia), Sujata Visaria (Hong Kong University of Technology)
	Informal Credit Market, Sham Litigation and Tax Deferment	Sugata Marjit (IIFT), Suryaprakash Mishra (National Law University, Delhi)

## Projects

### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Formulation of a perspective plan for holistic and sustainable development in the low-lying areas of Bilkanda I & II Gram Panchayats under Barrackpur – II Development Block in the District of North 24 Parganas	September, 2018	1 year	Nachiketa Chattopadhyay	Finance Department (Revenue) Government of West Bengal
2	Surguja Special Socio-Economic Survey	May, 2017	2 years	Nachiketa Chattopadhyay	Directorate of Economics and Statistics, Raipur, Chhattisgarh

### Completed Projects: Externally funded

Sl. No	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency (mandatory)
1	UNDP consultancy assignment for development of Disaster Score Card for India: development of Disaster Risk Index for the districts/ States/UTs and Disaster Resilience Index	June, 2018	June, 2019	Diganta Mukherjee	UNDP
2	Fraud Risk Analysis	August, 2018	September, 2019	Nachiketa Chattopadhyay	R S Software (India) Limited
3	Poverty and Aspiration	December, 2014	February, 2020	Sandip Mitra	Warwick University (ESRC, UK grant)

### Ongoing Projects: Projects for Govt of India

Sl. No	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Development of Browser-based Application of CAPI for NSSO 77 <sup>th</sup> Round Schedule (Phase I, II & III)	October, 2018	2 years	Nachiketa Chattopadhyay	NSSO (FOD) M.O.S.&P.I., Government of India
2	Developing of a demonstration module of e-learning on “Basic Official Statistics”	October, 2018	2 years	Nachiketa Chattopadhyay	NSSTA, M.O.S.&P.I., Government of India

**Completed Projects: Projects for Govt of India**

Sl. No	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Developing an Appropriate Methodology for Estimating Proportion of Villages with Specific Infrastructural Facility	April 2018	March 2020	Nachiketa Chattopadhyay	M.O.S.& P.I., Government of India
2	Developing an Appropriate Structure Preserving Estimation (SPREE) Method for Estimating Domain-Level Aggregates from NSSO Household Surveys	April 2018	March 2020	Nachiketa Chattopadhyay	M.O.S.&P.I., Government of India

## SOCIO-ECONOMIC RESEARCH UNIT (SERU), NORTH-EAST CENTRE, TEZPUR

The Socio-Economic Research Unit (SERU) at the North-East Centre (N-E) of the Institute was established in August 2018. This Unit was formed keeping in mind that socio-economic conditions are quite different in the N-E region of the country requiring intensive and continued research on different socio-economic problems facing this region, with emphasis on application of time series and econometric tools. Along with this, of course, research work on challenging and emerging national and global economic issues would also be done. It was also felt that given the importance of quantitative economics in private and public sectors and also in MNCs these days, an undergraduate programme in quantitative economics would be started at the N-E Centre, and this Unit would take the major responsibility of teaching in this programme. Further, short-term training programmes for N-E government officials on different types of official data on socio-economic variables as well as workshops and training programmes for research fellows, teachers and other researchers on frontier topics of economics, econometrics, and mathematical economics would also be organised by this Unit regularly.

**Current Area of Research**

Name	Research topic(s)	Collaborators
Mridu Prabal Goswami	Strategy-proof and Fair allocations with Negative Externality	Manipushpak Mitra (ERU, ISI Kolkata), Soumendu Sarkar (TERI School of Advanced Studies, India)
	Learning from the Past Experiments on the Dictator Game	Sanmitra Ghosh (Jadavpur University), Shubhro Sarkar (IGIDR, India)
	A General Model of Multidimensional Mechanism Design	Dipjyoti Mazumdar (Concordia University, Canada)
	Coordination in Efforts: Shapley Value Distribution in an Uncertain Economic Environment	Surajit Borkotokey (Dibrugarh University, India), Sujata Goala (Dibrugarh University, India)
	A characterization of lexicographic preferences	Manipushpak Mitra (ISI Kolkata, India), Debapriya Sen (Ryerson University, Canada)
	Expanding and Confusing Choice-space: a case for Lexicographic Preferences	Manipushpak Mitra (ERU, ISI Kolkata), Debapriya Sen (Ryerson University, Canada)
	Interior Inefficiency Leads to Absence of Fairness	
	Notes on Opportunity Efficiency	Anuj Bhowmik (IGIDR, India), Indraneel Dasgupta (ISI Kolkata, India)
Kushal Banik Choudhury	Macroeconomic Uncertainty	Srikanta Kundu (CDS, Trivandrum) and Kaustav Kanti Sarkar (RBI, Mumbai)
	COVID-19 Spread	Nityananda Sarkar (ISI, Kolkata)
	Oil Price, Exchange Rate	Bhavesh Garg (IIT, Ropar)

# SOCIOLOGICAL RESEARCH UNIT (SRU), KOLKATA & GIRIDIH

The Scientific workers (both faculty & non-faculty) of this unit perform various academic activities like teaching and research in several sociological areas like land and its utilization pattern, contract farming, nutritional status, overweight and obesity of school-going children, gender, wage labour in unorganised sector, unpaid family labour, Farm sector labour force, social network analysis approach for studying inter-state relation through migration and trade. They also participate in academic administration, organization of seminars/conferences, participation and presentation of research paper in national and international level seminars/conferences, supervision of Ph.D. theses and dissertation of post-graduate students.

## Current Area of Research

Name	Research topic(s)	Collaborators
Hari Charan Behera	Land-leasing arrangements and function in eastern India	
	Contract farming: Participation, partnership and socioeconomic development in eastern India	
	Baseline survey of beneficiaries of horticulture development in Paschimanchal districts of West Bengal	Manoranjan Pal, and Bholanath Ghosh
	Strengthening livelihood opportunities for the forest dwellers in Jharkhand and Odisha	
	Groundwater Quality Assessment Using Fuzzy-AHP in An Giang Province of Vietnam	Huynh Vuong Thu Minh (Hokkaido University, Japan), Ram Avtar (Hokkaido University, Japan), Pankaj Kumar (IGES, Japan), Dat Q Tran (University of Arkansas, USA), Tran Van Ty (Can Tho University, Vietnam), Masaaki Kurasaki (Hokkaido University, Japan)
Susmita Bharati	Unequal Effect of Parents' Education on Child Health and Health Care	Pal M (Ex-ISI, Kolkata), Dey UK (NEHU, Shilong), Bharati P (Ex-ISI, Kolkata)
	Prevalence of anaemia among 6- to 59-month-old children in India: the latest picture through the NFHS-4	Pal M (Ex-ISI, Kolkata), Bharati P (Ex-ISI, Kolkata)
	Nutritional health status and morbidity pattern among (0-59)-month children in India: A study with the latest data of NFHS	Pal M (Ex-ISI, Kolkata), Bardhan A, Dhara P, Srivastava M ( ISI, Kolkata) and Bharati P (Ex-ISI, Kolkata).
	Malnutrition and anaemia among adult women in India	Pal M (Ex-ISI, Kolkata), Sen Soumendu, Bharati P (Ex-ISI, Kolkata)
	Overweight and obesity among the adult population in North India	Bharati P (Ex-ISI, Kolkata), Pal M (Ex-ISI, Kolkata)
	Impact of basic amenities and socio-economy on women health of tribal concentrated zones in India	Shome S (Ex-ISI, Kolkata), Pal M (Ex-ISI, Kolkata) and Bharati P (Ex-ISI, Kolkata)
	A micro-level study of impact of life-style and socio-economy on adolescent overweight or obesity in Kolkata city, West Bengal	Shome S (Ex-ISI, Kolkata), Pal M (Ex-ISI, Kolkata) and Bharati P (Ex-ISI, Kolkata)
Sonali Chakraborty	Contribution of the unpaid family labour in the handloom sector of textile industry in West Bengal	
Rabindranath Jana	An Empirical Study on Social Networks of Rural People for Understanding Their Survival Strategy	Anil K Choudhuri (Ex-, ISI, Kolkata)
	Reciprocation of Indian States on Trade Relation	Vidhyarani P. (Sri Parasakthi College for Women, Tamil Nadu) and Maruthakutti R. (M.S. University, Tamil Nadu)

## Projects

### Completed Projects: Internally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)
1	Contract farming: Participation, partnership and socioeconomic development in eastern India	April 1, 2018	2 years	Hari Charan Behera
2	A micro-level study of impact of life-style and socio-economy on adolescent overweight or obesity in Kolkata city, West Bengal	April 1, 2018	2 years	Susmita Bharati

### Completed Projects: Externally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Baseline Survey of Beneficiaries of Horticulture Development in Paschimanchal district in West Bengal	April 1, 2018	March 31, 2020	Hari Charan Behera	Government of West Bengal

### Completed Projects: Projects for Govt of India

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Strengthening livelihood opportunities for forest dwellers in Jharkhand and Odisha	April 1, 2018	March 31, 2020	Hari Charan Behera	Ministry of Tribal Affairs, Government of India





# STATISTICAL QUALITY CONTROL AND OPERATIONS RESEARCH DIVISION (SQC&OR)

**Head:** ASHIS KR. CHAKRABORTY, SQC & OR Kolkata

**Office:** 6th floor, A.N. Kolmogorov Bhavan, ISI, Kolkata-700 108

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## 1. SQC & OR Unit, Bengaluru

Head of Unit: E. V. GIJO (till September 2019)  
BOBY JOHN (October 2019 onwards)

Number of Faculty/ Faculty-equivalent: Eight (8)

Office: 8th Mile, Mysore Road, ISI, Bengaluru- 560 059

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## 2. SQC & OR Unit, Chennai

Head of Unit: G. RAVINDRAN

Number of Faculty/ Faculty-equivalent: Four (4)

Office: 37 Nelson Manickam Road, Aminjikarai, ISI, Chennai-600 029

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## 3. SQC & OR Unit, Coimbatore

Head of Unit: A. RAJAGOPAL

Number of Faculty/ Faculty-equivalent: One (1)

Office: 1st Floor 514, Mettupalayam Road, North Coimbatore, Coimbatore - 641 043

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## 4. SQC & OR Unit, Delhi

Head of Unit: RINA CHAKRAVORTY

Number of Faculty/ Faculty-equivalent: Two (2)

Number of Research Scholars: One (1) post-doctoral Fellow

Office: 7, S.J.S. Sansanwal Marg, ISI, New Delhi- 110 016

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## 5. SQC & OR Unit, Hyderabad

Head of Unit: S. M. SUBHANI

Number of Faculty/ Faculty-equivalent: Four (4)

Number of Research Scholars: One (1)

Office: Street Number 8, Habsiguda, ISI, Hyderabad- 500007

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## 6. SQC & OR Unit, Kolkata

Head of Unit: NANDINI DAS

Number of Faculty/ Faculty-equivalent: Fifteen (15)

Number of Research Scholars: Seven (7)

Office: 6th floor, A.N. Kolmogorov Bhavan, ISI, Kolkata-700 108

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## 7. SQC & OR Unit, Mumbai

Head of Unit: SAGAR SIKDER

Number of Faculty/ Faculty-equivalent: Two (2)

Office: Prathista Bhavan, 3rd Floor, 101, Maharshi Karve Road, ISI, Mumbai - 400 020

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## 8. SQC & OR Unit, Pune

Head of Unit: SUBRATA RATH

Number of Faculty/ Faculty-equivalent: One (1)

Office: B-Wing, 3rd Floor, Anandvan Housing Society, Near Gandhi Bhavan, 36, Kothrud, ISI, Pune - 411 038

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## SQC & OR UNIT (SQC&OR), BENGALURU

The major activities of the unit are academic programmes, research, industrial training & consultancy services, and organization of short-term training programs and symposia. Currently, the unit is handling two academic courses namely, Master of Science in Quality Management Sciences (MS-QMS) and Part-Time Diploma in Statistical Quality Control. The first and second semesters of 6th batch of MS-QMS programme and 98th & 99th batches of the Part-Time Course are completed during 2019-20. The 100th batch of Part-Time Course has started with 26 students during February 2020. As part of research activities, the faculties have published eight papers in Scopus indexed journals during 2019-20. The unit has undertaken 26 consultancy and training assignments and generated Rs.1,49,77,000/- as training and consultancy fee during 2019-20. The unit has also organized the Six Sigma Case Study Presentation Contest during 27-28 February 2020 and additionally generated Rs.4,24,000 through participation fee.

### Current Area of Research

Name of Faculty	Research Topic(s)	Collaborators
Boby John	Simultaneous Optimization of Continuous and Categorical Characteristics	Pooja Mansharamani
	Optimization of Software Development Life Cycle Process	Rajeshwar S Kadadevaramath
	Modified Control Chart for Non-normal Characteristics	Subhani S M
	Service Level Agreement Baselineing for Non-Normal Characteristics	Subhani S M

### Projects

#### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Six Sigma training and consultancy	April 1, 2014	6 years	Sanjit Ray	Mother Dairy, Delhi
2	Foundation course on machine learning using python	March 18, 2020	1 year	Boby John	Caterpillar Pvt Ltd.

#### Completed Projects: Externally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Expert support to clarify doubts on statistical process control study	May 1, 2019	December 31, 2019	K K Chowdhury	Toyota Kirloskar Auto Parts Pvt Ltd
2	Six Sigma Green Belt certification programme	17.02.2020	February 21, 2020	A Roy Chowdhury	BHEL WRI, Trichy
3	Training and project guidance on Six Sigma Black Belt & DFSS	June 1, 2018	March 1, 2020	U H Acharya	Bharat Electronics, Bengaluru
4	Training and project guidance on Six sigma DFSS	May 1, 2019	March 1, 2020	U H Acharya	TVS Motors, Hosur
5	Training and project guidance on Six Sigma Black belt, simple tools of quality control and statistical techniques for HR	April 1, 2019	March 1, 2020	U H Acharya	FIAT India, Pune
6	Executive Program on Operational Excellence – A Six Sigma Approach	October 21, 2019	October 25, 2019	Somnath Ray, E V Gijo, A Roy Chowdhury	HAL Management Academy
7	Training on design of experiments	01.12.2019	March 30, 2020	E V Gijo, Somnath Ray, A Roy Chowdhury	BIOCON Ltd, Bengaluru
8	Six Sigma Green Belt certification	June 10, 2019	July 10, 2019	E V Gijo	HBL Power Systems Ltd
9	Training and consultancy on business analytics	March 1, 2019	October 31, 2019	Boby John, K K Chowdhury	Hewlett Packard Inc
10	Problem solving using design of experiments program	April 1, 2019	March 31, 2020	Boby John	Syngene International

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
11	Certification program on Six Sigma green belt	July 1, 2019	March 31, 2020	Boby John	Walvoil Fluid Power
12	Training and consultancy on the design of experiments	August 1, 2019	March 31, 2020	Boby John	Toyota Industries Engine India Ltd
13	Foundation course on predictive modeling using python	May 1, 2019	April 30, 2020	Boby John	Manthan Software Services
14	Foundation course on predictive modeling using python	01.11.2019	May 31, 2020	Boby John, K K Chowdhury	LKQ India

## SQC & OR UNIT (SQC&OR), CHENNAI

### Current Area of Research

Name of Faculty	Research Topic(s)	Collaborators
D. Sampangi Raman	Time Series with Pattern Recognition	
G. Ravindran	Linear Complementarity, Stochastic Games	
Surajit Pal	Process Capability and Control Charts for Processes with Zero Inflated Count Data	Sushanta Kumar Gauri, ISI Kolkata

### Projects

#### Completed Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Statistics for Process Optimization	December 2, 2019	December 4, 2019	D. Sampangi Raman	Timken Engineering & Research India, Chennai
2	Design of Experiments	December 9, 2019	December 10, 2019	D. Sampangi Raman	Srichakra Tyres, Madurai

## SQC & OR UNIT (SQC&OR), COIMBATORE

### Projects

#### Completed Projects: Externally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Lean Six Sigma project-oriented training and Development programme	Apr. 2019	Aug. 2019	A. Rajagopal	Lakshmi Machine works, Advance Technology Centre, Coimbatore
2	Quality, Productivity, Reliability through Business Intelligence	July. 2019	Sep. 2019	A. Rajagopal	Brocade India Polytex Pvt Ltd, Palakkad
3	Project Management of External Assignments for Customers	Aug.2019	Nov. 2019	A. Rajagopal	Fluid Control Research Institute, Palakkad
4	Surveillance audit and Technical Review of future programme of Action	Sept. 2019	Oct. 2019	A. Rajagopal	MYK, Hyderabad

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
5	Training and Consultancy to improve Quality, increase productivity, reduce waste	Nov. 2019	Nov. 2019	A. Rajagopal	SRF Limited, Trichy
6	System Analytics preparation	Dec.2019	Feb.2020	A. Rajagopal	SRC, Salem
7	Sensors and Artificial Intelligence for Predicting Brake pad Wear in Car	Jan.2020	Mar.2020	A. Rajagopal	Brakes India, Chennai
8	Training and Consultancy to improve Quality, increase productivity, reduce waste	Feb 21, 2020	Feb 22, 2020	A. Rajagopal	Gilbarco Veeder Root India Pvt Ltd, Coimbatore

## SQC & OR UNIT (SQC&OR), DELHI

### Current Area of Research

Name	Research topic(s)	Collaborators
S.K. Neogy	Mathematical Programming, Linear Complementary 'its generalizations, Optimization problem in graph theory, (study of matrix classes useful in complementarity, Optimization and game theory), Non-cooperative games, Algorithms for Stochastic Games.	
Rina Chakravorty	Design of Experiments-Static Characteristics, Dynamic Characteristics and Categorical Characteristics in a multi-response processes.	

## SQC & OR UNIT (SQC&OR), HYDERABAD

### Current Area of Research

Name	Research topic(s)	Collaborators
G. S. R. Murthy	Operations Research	D K Manna (SQC&OR Unit, ISI Kolkata)
S. M. Subhani	Fuzzy Probabilistic Metric Space	

### Projects

#### Completed Projects: Internally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)
1	Training program on Business Analytics using R	October 31, 2019	November 16, 2019	S M Subhani
2	Training program on Six Sigma Green Belt	December 10, 2019	December 14, 2019	S M Subhani
3	Certification Program on Business Analytics with a focus on Data Science, Machine Learning, Artificial Intelligence	February 23, 2019	June 23, 2019	G Murali Rao
4	Optimization Tools for Business Analytics	February 24, 2019	April 14, 2019	G S R Murthy

#### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Six Sigma Training and Guidance (Wave III) towards Business Excellence	November 1, 2019	8 months	A L N Murthy	ITC Limited, PSPD, Bhadrachalam, AP

**Completed Projects: Externally funded**

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
I	Estimation of Gross Bet Value: Determining House Advantage for arriving at the gross bet value of Casinos	July 10, 2019	November 10, 2019	G S R Murthy	Directorate of GST Intelligence, Hyderabad Zonal Unit

## SQC & OR UNIT (SQC&OR), KOLKATA

The activities of faculty members of SQC&OR Unit, Kolkata include teaching, research, consultancy, training and project work. The faculty members teach in the B.Stat., M.Stat., M.Tech. (QROR), MS (QE) programmes of the Institute. They supervise the research of Ph.D. scholars, provide consultancy to various industries in India and organize workshops and seminars.

### Current Area of Research

Name	Research topic(s)	Collaborators
A. K. Das	Some Aspects on Solving Transportation Problem	Deepmala and R. Jana
	On the Convergence of an Iterative Method for Solving Linear Complementarity Problem with WGSPBD Matrix	R. Jana and Deepmala
	On Semi-monotone Star Matrices and Linear Complementarity Problem	R. Jana and S. Sinha
	More on hidden Z-matrices and linear complementarity problem	R. Jana and A Dutta
A. R. Mukhopadhyay	Implementation issues in supply chain for lean technology and circular economy in operations management encompassing ZED.	Raktim Dasgupta (Jadavpur University, Mechanical Engineering Department)
	Impact of waste management on attainment of targets of sustainable development goals.	Sonali Roy Chaudhury (Jadavpur University, Mechanical Engineering Department)
A. K. Chakraborty	Reliability estimation of flight softwares used by ISRO	
	Modelling imbalanced Data	Tanujit Chakraborty(SRF)
	Hardware Reliability and Availability	Subrata Rath
	Change point models	Soumen De
B. Pradhan	Bayesian optimal warranty length under Type-II unified hybrid censoring scheme	Tanmay Sen (Ericson, Kolkata), Ritwik Bhattacharya (Tecnológico de Monterrey, Querétaro Campus, Mexico) and Yogesh Mani Tripathi (IIT Patna)
	Stochastic comparison of lifetimes of series and parallel systems with dependent and heterogeneous component	Arindam Panja and Pradip Kundu (Birla Global University, Bhubaneswar)
	Variability and skewness ordering of sample extremes from dependent random variables following the proportional odds model	Arindam Panja and Pradip Kundu (Birla Global University, Bhubaneswar)
	Generalized weighted survival and failure entropies and their dynamic versions	
	On weighted cumulative Tsallis residual and past entropy measures	Siddhartha Chakraborty
	Quantile based analysis of dynamic survival and failure entropy measures	
D. K. Manna	Operations Research	G S R Murthy
Md. Z. Anis	Probabilistic Modeling of Flood Hazard and its Risk Assessment	P Manna (ISI) , P Das (ISI), and Soumya Banerjee (Birla Institute of Technology, Deoghar)

Name	Research topic(s)	Collaborators
	Skewed Raised-Cosine Distribution	Mohammad Ahsanullah (Rider University, USA)
	Sine-Skewed von Mises Distribution	
N. Das	Multivariate control chart for process dispersion	Ayushi Mishra (Calcutta University)

## Projects

### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Support to Carry Out Large Scale Government Projects (at QCI)	01 September 2019	2 Years	Amitava Bandyopadhyay	QCI
2	Development of Statistical Model for Reliability Estimation of the Flight Software of Launch Vehicles of ISRO	November 1, 2019	18 months	Ashis Kumar Chakraborty	ISRO, Bengaluru
3	Training Programme and Projects on Data Analytics	17.02.2020	12 months	Ashis Kumar Chakraborty	Coal India Limited

### Completed Projects: Externally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Baseline Survey at LWSIT	01 December 2017	31 December 2019	Ranjan Sett	LWSIT
2	Development of Sampling Plan and Protocol	01 April 2018	31 March 2020	Ranjan Sett	ITC Limited
3	Support to Carry Out Large Scale Government Projects (at QCI)	01 June 2019	31 March 2020	Amitava Bandyopadhyay	QCI
4	Training Programme on Analytics	01 January 2019	31 January 2020	Ranjan Sett	Tata Steel
5	Training Programme on Statistical Concepts to Improve Client Experience and Retention with followup Project Support	01 October 2019	31 December 2019	Amitava Bandyopadhyay	American Express
6	Normalization of Marks	April 1, 2019	March 31, 2020	Ashis Kumar Chakraborty	Admission Committee for Professional Courses, Gujarat
7	Training Programme on Six Sigma Green Belt	March 2, 2020	March 6, 2020	Ashis Kumar Chakraborty	Indian Oil Institute of Petroleum Management

## SQC & OR UNIT (SQC&OR), MUMBAI

SQC & OR Unit, Mumbai commenced its operations from 1965 and is still serving a wide variety of organizations, both Manufacturing and Service, across the country through training and consultancy in the fields of Statistics and Operations Research. The unit activities comprise (i) Consultancy and project assignments, (ii) Conducting in-plant and general Training, (iii) Teaching and training.

### Current Area of Research

Name	Research topic(s)	Collaborators
Sagar Sikder	Multivariate Statistical Process control	

## Projects

### Completed Projects: Internally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)
1	Workshop on Statistical Techniques in Research Methodology	21.10.2019	24.10.2019	Dr. Ashok Sarkar

### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Six Sigma Master Black Belt Certification Programme	22.04.2019	1 Year	Ashok Sarkar	External Participants
2	Six Sigma Black Belt Certification Programme	26.08.2019	2 Years	Sagar Sikder	External Participants
3	Six Sigma Green Belt Training and Certification	27.08.2019	1 Year	Ashok Sarkar	Kalpataru Power and Transmission Ltd.

### Completed Projects: Externally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Advance Statistics for Process Improvement	10.12.2018	19.06.2019	Ashok Sarkar	JSW STEEL LIMITED, DOLVI WORKS
2	Weekend Six Sigma Green Belt Training	27.04.2019	05.05.2019	Sagar Sikder	External Participants
3	Training and Implementation of Sampling Plan	14.02.2019	23.10.2019	Ashok Sarkar	TAL MANUFACTURING SOLUTIONS LTD.
4	Training Program on Statistics for Data Science	24.01.2019	04.04.2019	Ashok Sarkar	Larsen and Tourbo Limited
5	Six Sigma Green Belt and Certification	3.06.2019	7.06.2019	Sagar Sikder	CONTROLLER OF NAVAL ARMAMENT INSPECTION
6	Six Sigma Green Belt Certification Program	2.08.2019	11.08.2019	Sagar Sikder	External Participants
7	Certification Program on Business Analytics and Data Mining	08.11.2019	12.02.2020	Ashok Sarkar	External Participants
8	Six Sigma Green Belt Certification Program	13.12.2019	22.12.2019	Sagar Sikder	External Participants
9	Basic Statistics and Capability Analysis using Minitab	11.06.2019	05.09.2019	Sagar Sikder	VERTELLUS SPECIALTY MATERIALS (INDIA) PVT. LTD.
10	Six Sigma Green Belt Certification Program	05.08.2019	20.09.2019	Ashok Sarkar	L & T - MADH
11	Statistical Techniques for Business Forecasting	21.02.2020	23.02.2020	Ashok Sarkar	External Participants
12	Workshop on FMEA	05.09.2019	05.09.2019	Ashok Sarkar	GIA Ltd
13	Green Belt Certification Program during	04.12.2019	07.02.2020	Sagar Sikder	L&T Mysore
14	Workshop on "Statistics for Data Science forGET's"	19.11.2019	10.12.2019	Ashok Sarkar	L&T Corporate HR
15	Workshop on FEMA (2019 Version)	04.03.2020	06.03.2020	Ashok Sarkar	L&T-(Electrical & Automation)-Powai
16	Training Program on Statistics	15.04.2019	16.04.2019	Ashok Sarkar	ERNST & YOUNG LLP
17	Training Program on Statistical Techniques for Business Forecasting	25.06.2019	27.06.2019	Ashok Sarkar	External Participants
18	Workshop on Six Sigma	14.06.2019	15.06.2019	Ashok Sarkar	ABM KNOWLEDGEWARE LIMITED, MUMBAI
19	Workshop on Design of experiments	16.05.2019	19.07.2019	Ashok Sarkar	HILTI MANUFACTURING INDIA PVT. LTD.
20	SPC Training Program	24.07.2019	25.07.2019	Ashok Sarkar	GRASIM INDUSTRIES LIMITED

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
21	Training on "Statistical Tools"	08.08.2019	09.08.2019	Ashok Sarkar	HINDUSTAN UNILEVER LTD
22	FEMA Project Review	11.09.2019	12.09.2019	Ashok Sarkar	L&T Powai
23	Statistical Analysis Program	10.02.2020	11.02.2020	Ashok Sarkar	Pulp & Fibre Innovation Centre, Grasim, Mumbai

## SQC & OR Unit (SQC&OR), Pune

The Unit dealt with more of Training programmes and consultancy activities during 2019-2020

### Current Areas of Research

Name	Research topic(s)	Collaborators
Subrata Rath	Dynamic Reliability Model	Ashis Chakraborty
	Six Sigma	Ramakrishna Padhi (IIM, Kashipur)
	DFSS	
	Data Analytics	

### Projects

#### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Data Analytics	20-Mar-20	1 year	S. Rath	Eaton Technology, Pune

#### Completed Projects: Externally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Statistics Training	April 16, 2019	April 17, 2019	S. Rath	Bajaj Auto
2	Statistics Training	April 27, 2019	April 28, 2019	S. Rath	Springer Nature
3	Six Sigma Green Belt	June 7, 2019	June 11, 2019	S. Rath	Jai Balaji, Durgapur
4	Statistics Training	June 13, 2019	June 14, 2019	S. Rath	Bajaj Auto
5	Design of experiments	July 2, 2019	July 2, 2019	S. Rath	Philips Carbon Black, Baroda
6	Six Sigma Black-Belt	July 6, 2019	August 11, 2019	S. Rath	Public Program
7	Six Sigma Green Belt	August 5, 2019	August 9, 2019	S. Rath	Public Program
8	Statistics Training	September 3, 2019	September 4, 2019	S. Rath	Serum Institute
9	Statistics Training	September 9, 2019	September 10, 2019	S. Rath	HEG, Bhopal
10	Master Black-Belt	October 14, 2019	October 26, 2019	S. Rath	Public Program
11	Statistics Training	October 31, 2019	November 1, 2019	S. Rath	Associated Capsule, Dahanu
12	Data Analytics	November 9, 2019	December 1, 2019	S. Rath	V K Technology, Pune
13	Statistics Training	December 17, 2019	December 18, 2019	S. Rath	Bajaj Auto
14	Six Sigma Consulting	January 1, 2020	March 31, 2020	S. Rath	TACO
15	Six Sigma Black-Belt	January 4, 2020	February 9, 2020	S. Rath	Public Program
16	Six Sigma Green Belt	January 27, 2020	January 31, 2020	S. Rath	NTPC, Noida
17	Six Sigma Green Belt	February 10, 2020	February 14, 2020	S. Rath	Public Program
18	Master Black-Belt	March 2, 2020	March 14, 2020	S. Rath	Public Program



# THEORETICAL STATISTICS AND MATHEMATICS DIVISION (TSMD)

**Professor In-Charge:** B.V. RAJARAMA BHAT, SMU, Bengaluru  
**Office:** 8th Mile, Mysore Road, ISI, Bengaluru - 560 059

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## 1. Stat-Math Unit (SMU), Bengaluru

Head of Unit: JAYDEB SARKAR  
Number of Faculty: Twenty (20)  
Number of Research Scholars: Eighteen (18)  
Office: 8th Mile, Mysore Road, ISI, Bengaluru - 560 059

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## 2. Stat-Math Unit (SMU), Delhi

Head of Unit: ARUP K. PAL  
Number of Faculty: Eleven (11)  
Number of Research Scholars: Two (2)  
Office: 7, S.J.S. Sansanwal Marg, ISI, New Delhi- 110 016

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## 3. Stat-Math Unit (SMU), Kolkata

Head of Unit: RITABRATA MUNSHI  
Number of Faculty: Twenty-seven (27)  
Number of Research Scholars: Twelve (12)  
Office: 2nd floor, A.N. Kolmogorov Bhavan, ISI, Kolkata-700 108

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# STAT-MATH UNIT (SMU), BENGALURU

Stat-Math Unit Bengaluru Centre has been very active in conducting research in various fields of Mathematics such as Algebraic Geometry, Number Theory, Operator Theory, Operator Algebras, Quantum Probability and different fields in Probability and Statistics, Stochastic geometry, Random topology, Random graphs, Bayesian Statistical Inference, Statistical Ecology, Group actions, Roots of completely positive maps, etc. The Unit is also involved in conducting Mathematics Olympiad camps and Madhava competition, besides regular teaching in the B. Math. and M. Math. programmes.

## Current Areas of Research

Name	Research topic(s)	Collaborators
Aniruddha C Naolekar	Algebraic Topology: Understanding characteristic classes of vector bundles over CW-complexes in general and manifolds in particular.	B Subhash (IISER-Tirupati), Ajay Singh Thakur (IIT-Kanpur)
B V Rajarama Bhat	Roots of completely positive maps	Vijaya Kumar U.
	Dilation theory of operators and word systems	Sandeepan De and Narayan Rakshit
	Positive operator valued measures and $C^*$ -extreme completely positive maps.	Manish Kumar
	CP maps on unbounded operators and Radon-Nikodym theorem	Santhosh Kumar and Anidhya Ghatak
	Unitary equivariant maps	Gunjan Sapra
CRE Raja	Group actions	A. Mandal (Post-doc)
Jaydeb Sarkar	Operator theory	Dan Timotin (Simion Stoilow Institute of Mathematics, Romanian Academy of Sciences, Bucharest, Romania), B. Krishna Das (IIT Mumbai), Sushil Gorai (IISER, Kolkata), Kui Ji (Hebei Normal University, China), Kalpesh Haria (IIT Mandi)
Maneesh Thakur	Self isotopic Jordan algebras	Holger Petersson (Fern-University, Hagen-Germany)
Manish Kumar	Algebraic geometry: Galois theory, ramification theory, etale and Nori fundamental groups	Soumyadip Das, Souradeep Majumder, A.J. Parameswaran, Indranil Biswas
Mohan Delampady	Bayesian Statistical Inference, Statistical Ecology	Arjun Gopalaswamy, Scientific Consultant, Wildlife Conservation Society
Siva Athreya	Working with models that arise in Statistical physics and Population biology. The specific topics include interacting particle systems, semi-linear partial differential equations, stochastic partial differential equations, diffusions on R-Trees, Dense/Sparse graph limits, and Trap models	
Yogeshwaran Dhandapani	Stochastic geometry, Random topology, Random graphs	Guenter Last, Michael Klatt, Giovanni Peccatti, Omer Bobrowski, Matthias Schulte, Primoz Skraba, Purvi Gupta, Siva Athreya, Manjunath Krishnapur, Akshay Goel, Sanjay Jhavar, Frank den Hollander, Roman Kotecky.

## Projects

### Completed Projects: Internally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)
1	Discussion Meeting on Stochastic Analysis, Geometry, and Random Fields	January 6, 2017	January 10, 2020	Yogeshwaran Dhandapani, Parthanil Roy, Matthew Joseph

### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	J C Bose Fellowship project	March 1, 2017	February 28, 2022	B V Rajarama Bhat	SERB
2	Geometric statistics of stationary point processes	July 1, 2018	June 30, 2021	Yogeshwaran Dhandapani, Bartłomiej Błaszczyszyn	Indo-French Centre for Applied Mathematics
3	Understanding the persistent homology of a point process	August 14, 2014	August 13, 2020	Yogeshwaran Dhandapani	Department of Science and Technology (DST)
4	Factorizations of bounded analytic functions and kernels	January 13, 2020	3 years	Jaydeb Sarkar	DST
5	n-tuples of commuting isometries	May 24, 2018	3 years	Jaydeb Sarkar	DST
6	Contractive Hilbert modules	June 14, 2016	3 years	Jaydeb Sarkar	NBHM
7	Stochastic Analysis and Its Applications	May 28, 2018	3 years	Siva Athreya	DST
8	Stochastic Partial Differential Equations	May 28, 2018	3 years	B. Rajeev	DST
9	Coupled Stochastic Partial Differential Equations (SPDE's)	January 16, 2020	3 years	B. Rajeev	DST
10	Probabilistic and Statistical Aspects of Branching Random Walks	May 28, 2018	3 years	Parthanil Roy	DST
11	Swarnajayanthi Fellowship	June 25, 2019	5 years	Parthanil Roy	DST

## STAT-MATH UNIT (SMU), DELHI

### Current Areas of Research

Name	Research topic(s)	Collaborators
Antar Bandyopadhyay	A Last Progeny Modified Branching Random Walk	Ghosh, Partha Pratim
	Interacting Urns on an Infinite Directed Half-line	Kaur, Gursharn and Sahasrabudhe, Neeraja
Arindam Chatterjee	Resampling, High-dimensional statistics	
Arup Kumar Pal	Quantum groups and Noncommutative Geometry	Partha Sarathi Chakraborty
Isha Dewan	Reliability and Survival Analysis / Nonparametric Inference	
Rahul Roy	Percolation theory, Random graphs and Brownian web.	

Name	Research topic(s)	Collaborators
Shanta Laishram	Worked on the irreducibility of a general family of classical orthogonal polynomials, particularly Hermite-Laguerre polynomials and Generalized Laguerre polynomials and their associated Galois groups and got some interesting results generalizing an earlier result of Schur and others including some best possible result	Nair, S. and Shorey, T. N. & Jindal, Ankita
	Some interesting progress on the nonintegrality conjecture which involves sums of binomial coefficients	L'opez-Aguayo, D., Pomerance, C. , & Thongjunthug, T.
	Binary recurrence sequences as a product of factorials	Luca, F. & Sias, M.
Swagata Nandi	Estimation of Parameters of Multiple Chirp Signal in presence of Heavy Tailed Errors	
	Estimating parameters of burst type signal in stationary noise	
	Multichannel Sinusoidal Signal	
	Random Amplitude Chirp Signal in Additive Noise	
Tanvi Jain	Symplectic eigenvalues of positive definite matrices	Bhatia, Rajendra; Mishra, Hemant Kumar & Sengupta, Ritabrata
	Hadamard powers of doubly nonnegative matrices	
	Divergences on positive definite matrices	Bhatia, Rajendra & Gaubert, Stephane

## Projects

### Ongoing Projects: Externally funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Statistical methods of high-dimensional binary regression models in Presence of response misclassification	May 11, 2018	3 years	Chatterjee, Arindam	Science and Engineering Research Board (SERB), DST, Government of India
2	BOBASIO Region Airspace Safety Assessment Study	2019	2 years	Bandyopadhyay, Antar and Sarkar, Deepayan	Airport Authority of India
3	Interacting Urn Schemes	March 19, 2020	3 years	Bandyopadhyay, Antar	SERB, DST, Government of India
4	Geometry on the space of matrices and positivity properties	March 11, 2019	3 years	Jain, Tanvi	SERB, DST, Government of India
5	Irreducibility and Galois groups of Polynomials	May 11, 2018	3 years	Laishram, Shanta	SERB, DST, Government of India
6	Structure and representations of the CM algebra of continuous functions on type $A_n$ quantum groups	July 12, 2018	4 years	Pal, Arup K.	SERB, DST, Government of India
7	Confett percolation and covered area fraction	May 19, 2018	3 years	Roy, Rahul	SERB, DST, Government of India
8	Scaling limits in directed random trees-applications in models of drainage	May 24, 2018	3 years	Sarkar, Anish	SERB, DST, Government of India
9	SERB Woman Excellence Award	December 12, 2013	8 years	Jain, Tanvi	SERB, DST, Government of India
10	INSA- Senior Scientist	Jan 01, 2020		Bapat, R.B.	INSA
11	Inference problem in reliability	February 06, 2020		Dewan, Isha	SERB, DST, Government of India

**Completed Projects: Externally funded**

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)	Funding agency
1	Mandatory verification of VVPAT slip count with electronic result during counting of votes in elections to the Parliament & State Legislative Assemblies	September 25, 2018	September 24, 2019	Bhatt, A.G.	Election Commission of India
2	Random sampling method and sample size for data base of 11529 customers for investigation	May, 2018	May, 2019	Bhatt, A.G.	IOCL
3	Identify the reasons for delay in disposal of cases and evaluate capacity gap to manage the pendency of cases in district and sub-ordinate court			Bhatt, A.G.	DELHI JUDICIAL ACADEMY

## STAT-MATH UNIT (SMU), KOLKATA

The Unit focuses on research in Mathematics, Probability and Theoretical Statistics. The unit currently has 27 faculty members, 5 of them are Bhatnagar awardee. In Statistics the main focus are in: Statistical Study of Agreement, Statistical Inference, Statistical Study of Surveillance, Statistical Study of Apportionment Index, Statistical Modeling of Dyadic Interactions, Parametric and non-parametric classification, Study of Robust Estimators. Non-parametric statistics, Rates of convergence in Central Limit Theorem (CLT), Law of iterated logarithms (LIL) and Characterization theorems, High dimensional time series. In Probability Theory the main focus of research are: Stochastic Processes, Limit Theorems, Rates of Convergence and Expansions, Stochastic Integrals, Stochastic Differential Equations, Stability of stochastic dynamical systems, Random Walks, Martingale Theory and Stochastic Calculus, Stochastic approximation, Markov Chain Simulation, Random Continued Fractions, Bernoulli Convolutions and Iterated Function Systems, Large-dimensional Random Matrices, Record values, Extreme values, Moral hazard problems in economics, Resampling plans, Time series. and Kernel density estimates, Urn Model Asymptotics, free probability analogue of subexponential distribution, Asymptotics of Randomly weighted sum, Non-commutative probability, Diffusion approximations, Inference in panel data under cross-sectional dependence, Stochastic modelling of political business cycle Stochastic Modelling of financial crisis through trade and capital inflow, High dimensional random matrices and its applications, Free probability. In mathematics the main topics of research are: Noncommutative geometry: Levi civita connections, Hopf algebroid and their actions on noncommutative spaces, quantum symmetry, Commutative Algebra, Affine Algebraic Geometry, History of Mathematics, Analytic Number Theory, Circle method, Analytic theory of L-functions, Differential Geometry, non holonomic distributions of co-rank greater than 1, Harmonic analysis on harmonic manifolds, Riemann surfaces, Rigidity problems for negatively curved manifolds, Motivic Homotopy Theory.

### Current Areas of Research

Name	Research topic(s)	Collaborators
Kingshook Biswas	Holomorphic dynamics	Ricardo Perez-Marco (Universite Paris VI)
	Riemann surfaces	Ricardo Perez-Marco (Universite Paris VI), Indranil Biswas (Tata Institute of Fundamental Research Mumbai)
	Geometry of negatively curved manifolds	
	Analysis on Harmonic manifolds	Gerhard Knieper (Ruhr-Universitat Bochum), Norbert Peyerimhoff (Durham University), Rudra P. Sarkar (SMU, ISI Kolkata)
Neena Gupta	Finite generation of Noetherian algebras	Amartya K Dutta (ISI Kolkata) and Nobuharu Onoda (University of Fukui, Japan)
	Retracts of Polynomial Rings	Sagnik Chakraborty (RKMVERI, Belur Math), Nikhilesh Dasgupta (NMIMS, Mumbai) and Amartya K. Dutta (SMU, ISI Kolkata)
	Construction of Double Danielewski surfaces	Sourav Sen (RKM Vidyamandira)
Ritabrata Munshi	The sub-convexity problem	Saurabh Singh (IIT Kanpur)



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SOUTH ALABAMA  
LIBRARY



# Library, Documentation and Information Science Division (LDISD)

Divisional Head: KISHOR CHANDRA SATPATHY

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## 1. Library, Bengaluru Centre

Name of the In-charge : JISHNU BISWAS

Name of the Primary Contact with Email : C. R. E. Raja (creraja@isibang.ac.in)

Address for Postal Communication : 8th Mile, Mysore Road, ISI, Bengaluru 560059

Phone number (office) : 080-2698 5315/16 / Email: library@isibang.ac.in

Year of Establishment : 1976 (but formally inaugurated on 14 September 1978)

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## 2. Library, Chennai Centre

Name of the In-charge : T. M. KALPANA

Name of the Primary Contact with Email : Sampangi Raman (sampangi@isichennai.res.in )

Address for Postal Communication : 37, Nelson Manickam Road, Aminjikarai, ISI Chennai 600629.

Phone number (office) : 044 23740612, 04423740256 /Email : library@isichennai.res.in

Year of Establishment : 2011

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## 3. Library, Delhi Centre

Name of the in-charge with Email : UDAYA BHANU KANDHA (ubk@isid.ac.in )

Address for Postal Communication : 7, S. J. S. Sansanwal Marg, ISI, New Delhi 110 016

Phone number (office) : 011-4149 3975/ 76 / Email: library@isid.ac.in

Year of Establishment : 1974

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## 4. Library, North-East Centre, Tezpur

Name of the In-charge : KAKOLI GOGOI

Address for Postal Communication : Punioni, Solmara, ISI, Tezpur-784501

Phone number (office) : 9101531094 / Email : kakoli.gogoi@isine.ac.in

Year of Establishment : 2011

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## 5. Central Library, Kolkata

Name of the Chief Librarian with Email :KISHOR CHANDRA SATPATHY (ksatpathy@isical.ac.in )

Address for Postal Communication : 1st floor, S.N. Bose Bhawan, ISI, Kolkata 700108

Phone number (office) : 033-25752100 / Email : library@isical.ac.in

Year of Establishment : 1930

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## LIBRARY, BENGALURU CENTRE

Indian Statistical Institute Bengaluru Centre Library is aiming to be identified as a model library in the Indian academic scenario. The Library is providing many modern library services using internet and they are popularly known as web based information services. ISI Bengaluru Centre Library has also initiated interactive applications for its users. The library has developed a very distinguished collection in different knowledge domains such as Mathematics, Statistics, Systems Science, Information Science, Economics, Quality Management & Operations Research, Library & Information Science, Computation & Artificial Intelligence and so on. Various services are designed to meet the information needs of the faculty members, students, research scholars and visiting scientists. Walk-in users from the other institutions are also permitted to use the library.



The Indian Statistical Institute Bengaluru center was formally inaugurated on 14th September 1978. The Library of the ISI Bengaluru Centre came into existence on the same date. Initially, the DRTC Library collection formed the nucleus of the ISI Bengaluru Centre Library. On 14th September 1978, the DRTC Library consisted of 4332 accessioned documents. These documents include Books, Reports, Pamphlets, Reprints etc. At that time, the DRTC Library was receiving 64 Current titles of Periodicals; of which 34 were subscribed, and 30 were received on exchange against DRTC Publications.

Bengaluru Library has a Special Collection on Dr. S. R. Ranganathan (<http://www.isibang.ac.in/~library/portal/index.htm>)

### Library Collection:

The library subscribes to all major reputed journals in print and electronic form both foreign as well as Indian in the said fields. It has also a good collection of reference documents, govt. statistical reports and books on general interests. Currently, the total collection of the library books are 30,858 and 39 e-books, 20335 Journals and 262 in e-format are available. A total of 17798 Bound volume journals and 600 CDs are available in the library.

### Library services:

Library members can remotely access to all the important resources subscribed by the Kolkata library (e-books, e-journals) online. Other services are like lending, Inter-Library Loan, content search service, reading room service, reference service, reprography service, and electronic document delivery service etc.

The library provides RemoteXs facility to its users for accessing e-resources remotely. The library is also providing a plagiarism checking facility through URKUND to teachers and research scholars of the Institute.

## LIBRARY, CHENNAI CENTRE

ISI Chennai Centre library started in 2010. SQC & OR unit library established in 1959 and ISI Chennai Centre Hostel Library in 2010. These libraries merged with the Central Library in 2013. Chennai Centre library is fully automated with Koha (Library Automation software), Biometric patron recognition, Fully RFID enabled with ISO standards. Database entries in Koha were updated (in Z39.50 Standard bibliographic format) for all the books. Web OPAC and user self management systems incorporated with Koha. Books are classified under UDC and arranged accordingly with shelf guides etc. This evolving library aims to a vibrant collection in the fields of Statistics, Applied Statistics, Mathematics, Computer Science, Statistical Quality Control and Operation Research making it prototypical in functioning, administration and unique in collection.



### Library Collection:

The Library maintains an excellent collection of books, journals, magazines, question papers, multimedia resources etc. Library has a total collection of around 5900 books and reading materials. Institutional membership with Indian Institute of Technology, Madras was renewed regularly for extending the collection. Books from the Chennai center were referred by faculties from ISI Bengaluru through interlibrary loan. A total of Rs. 23928 was spent from the annual budget on books and one magazine. Total Rs. 75000 was spent on Computer.



### Library services:

Library members can remotely access to all the important resources subscribed by the Kolkata library (e-books, e-journals) online. Other services are like lending, Inter-Library Loan, content search service, reprography service and document delivery service etc. ISI Chennai Library website focuses to provide access to relevant information services, bibliographic and full text digital and printed resources to support the Scholarly Community of the Institute. It also shares a platform with ISI group institutions in Resource sharing to broaden the resource availability. Library is also open for reference to academic users of other educational and scientific institutions and its neighboring regions. The library provides RemoteXs facility to its users for accessing e-resources remotely. The library is also providing a plagiarism checking facility through URKUND to teachers and research scholars of the Institute. Library regularly organizes user orientation programme. Total number of documents circulated this year was 225. Number of Requests for Inter Library Loan was 4.

## LIBRARY, DELHI CENTRE

The Indian Statistical Institute, Delhi Centre, maintains an academic library, which aims to be a leading library in the fields of Economics, Mathematics, Statistics, Operations Research and Statistical Quality Control. The library caters mainly to the needs of students, scholars and staff of the Institute. However, it is also open for reference to academic and research users of other educational and scientific institutions of the city and its neighboring regions.

It is one of the modern libraries with an extensive collection of books, journals, CDs, reports, government publications and other documents in print and electronic formats. The ISI Delhi Centre library also act as one of the NBHM regional library of northern India and provides information resources to support academic and research activities in the areas of Mathematics, and allied subject areas.

### Library Collection:

The library subscribes to all major reputed journals in print and electronic form both foreign as well as Indian in the said fields. It has also a good collection of reference documents, govt. statistical reports and books on general interests. Currently, the total collection of the library (both books and bound journals) is about 52,000 volumes and a total of 500+ CDs are there of different reference books and journals including databases. A total of 186 bibliographic records added, 19 publications procured from ISI grant and 43 publications received as Gift. A total of Rs. 120000 spent from the annual budget on books and other materials.

### Library services:

Koha, library management software became fully operational since 24 February 2019 using the library local server. The database of books and journals available is updated regularly and an Web-OPAC facility has been provided for students and teachers to search for documents.

Library members can remotely access to all the important resources subscribed by the Kolkata library (e-books, e-journals) online. Other services are like lending, Inter-Library Loan, content search service, reading room service, reference service, reprography service, Current Awareness Service, Web-OPAC Facility and electronic document delivery service etc. More than 1500 publications have been circulated among the members, 200+ documents delivered electronically. Number of Requests for Inter Library Loan was 10 and a total of 50+ requests received for repro photo services.

The library provides RemoteXs facility to its users for accessing e-resources remotely. A total of 600+ documents downloaded and 1000 hits received through Remotex. The library is also providing a plagiarism checking facility through URKUND to teachers and research scholars of the Institute.

Library organized regular user orientation programme for users, Koha training for library staff, followed Coordination Committee guidelines under the supervision of Chief Librarian, ISI Kolkata on procurement of e-resources and other reading materials. Library has started new "Alert Services" for the users. Library is open for extended hours (5.30 p.m. to 9.00 p.m., Monday to Friday and 10.00 a.m. to 2.00 p.m. on Saturday).



<b>Total Library Members</b> <b>150</b>	<b>Total Library Personnel</b> <b>2</b>
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# LIBRARY, NORTH EAST CENTRE, TEZPUR

The ISI North East Centre Library was established in the year 2011 and shifted to its present permanent location in June, 2019. Library performs an important role in academic activities of the Institute from its inception. The Library endeavors to provide value services to its user community by developing quality documents in the field of Statistics, Mathematics, Economics and other allied subjects and library has a good collection on these subjects. Further, it has limited collection in the fields of Computer Science, Soil Science, Library Science and Environmental Science etc. The ISI N-E Centre Library always tries to fulfill the needs of the user community.

**Total Library  
Members 40**

**Total Library  
Personnel 1**

## Library Collection:

ISI North East Centre Library has an excellent collection of books and journals. To cater to the requirements of the user, the Library accessioned a total number of 2954 books, 764 Journals, 4 Newspapers and 2 magazines. Library has other special materials like 53 student project reports, 4 summer internship report, 4 technical reports, 58 CDs, 29 NRSC Satellite Data Product and books as gift. The Library subscribed to a good quality of electronic as well as print journals to fulfill the needs of the user community.

A total of 2954 bibliographic records processed. A total of Rs. 133581 was spent from the annual budget on books and other materials.

## Library services:

Library uses Koha, library management software. The database of books and journals available is updated regularly and a Web-OPAC facility is available for students and teachers to search the library collection.

Library members can remotely access to all the important resources subscribed by the Kolkata library (e-books, e-journals) online. The library provides RemoteXs facility to its users for accessing e-resources remotely. The library is also providing a plagiarism checking facility through URKUND to teachers and research scholars of the Institute. Other Library Services are: Circulation Service, Reading Room Service, Inter-Library Loan Service, Reference Service, Photocopy service, Electronic document delivery service, Current awareness service, Web-OPAC Facility, Web Enable Library Services (Access to online resources). More than 850 publications have been circulated among the members this year. A total of 170 requests received for repro photo services.

Library website has a total number of 347017 hits.



# CENTRAL LIBRARY, KOLKATA

The Library, Documentation and Information Science Division have been serving as one of the resourceful libraries in the area of Mathematics, Statistics and Allied Disciplines, providing a variety of library services to its users, maintains a network among the branch libraries located in Delhi, Bengaluru, Chennai, and Tezpur.

Library occupies five floors measuring about 56000 sq.ft.s carpet area and nine functional units at Kolkata remains open seven days a week throughout the year (except for four National Holidays) from 10AM-8PM (in working days) and till 6PM (in holidays, including Saturday and Sunday). The PCM Memorial Museum and Archive is an integral part of the Library.

### Library aims to

- Meet the informational, educational, recreational, and cultural needs of the user-community by providing up-to-date resources, highest quality services
- Encourage and facilitate reading, literacy and lifelong learning
- Protect the public's right to know by providing equal access to information
- Maintain publication-exchange-program of the Institute with international/national institutions/ organizations
- Continue to function as the Eastern Regional Library of the National Board of Higher Mathematics [NBHM], Department of Atomic Energy, Government of India since 1989

**Total Library Members**  
3209

**Total Library Personnel**  
33

**Annual Budget**  
10.82 Crore

**Number of Circulations**  
17037

### Library Collection:

The Library maintains an excellent collection of books, journals, reports, rare and special collection, government publications, data-books, theses and other documents/ materials in print and electronic formats.

- Library subscribed to all major online database like MathSciNet, AMS, IMS journals, Econlit with full text, Science Direct, Springer, Taylor & Francis, Wiley, Oxford University Press, Cambridge University Press, IEEE/IEL online, ACM Digital Library, JSTOR, Project Muse, SAGE and SCOPUS for providing data services to the potential users.
- In this reporting year library added Duke Mathematical Society Journals, Euclid Prime and many more important resources to its collection. It has also subscribed to the
- The library has the collection of Census data. Library also subscribed to different report datasets like Economic Outlook (CMIE), States of India (CMIE), IndiaStat (Socio-economic Statistical Information & facts on India), DistrictsofIndia (only West Bengal Districts), CEIC Databases (Global DB + Daily DB + Indian Premium DB).



**Books 138482 + 39937 (WCL)**



**e-Books 6816**



**12 Newspapers & 26 Magazines**



**Bound Vol. Journals 78142**



**e-Journals 7569**



**All major online databases**



**Reports 37070 & Datasets 8**



**CDs with Books 1252**



**Websites Hits 20000**



**Software adopted Dspace, Koha**

## Publication exchange programme:

Library maintains the publication exchange programme of “Sankhya - the Indian Journal of Statistics” with 35 National and International Institutions/ Organizations. About 23 international agencies are from various countries of the world such as Bangladesh, Belgium, Brazil, Canada, China, Taiwan, Croatia, Czech Republic, Denmark, France, Hungary, Italy, Japan, Pakistan, Poland, Romania, Russia, Slovakia, Spain, Switzerland, Thailand, UK and USA.

## Services Provided by the Library

<b>Data Downloads/ Hits via RemoteXs</b>	<p>Library provides electronic document delivery services in India and abroad. Library is also providing data download services with high-end computing facilities as well as photo-copying, data-copying, and printing etc.</p> <p>Active User 1958, 11305 MBs Data Downloaded</p>
<b>Number of Requests for Inter Library Loan</b>	50
<b>Requests Received for Repro-photo Services</b>	<p>Repro-Photo Unit Covered a total of 318 programmes, Organized by Defferent Units of ISI and taken the photos, Total no. of Photographs taken 8622, Passport Print 350, Photocopy BW 313112, Colour Print 9335, Spiral Binding 204, Lamination 73, Graphic Design 463</p>
<b>Details about Web-based Services Provided</b>	<ul style="list-style-type: none"> <li>▪ Web-OPAC</li> <li>▪ Remote Access to e-Resources</li> <li>▪ Online access to E-resources on campus</li> <li>▪ Access to Digital Scholar (IRINS-A Faculty Profile) and Researchers tools</li> </ul>
<b>New Services Undertaken by the Library</b>	<ul style="list-style-type: none"> <li>• A new framework of the Library Website (under LDISD domain) has been initiated to disseminate the information services that will make the library activities visible to remote users. Thus it enables better outreach.</li> <li>• Koha &amp; Web OPAC: Library has upgraded the version of Koha (ILMS 18.11) this year. Total 10.56 GB data is stored in Koha- ILMS (Bibliographical database).</li> <li>• A trial access to ExLibris (Alma &amp; Primo) and Implementation of Digital Commons is in the pipeline.</li> </ul>
<b>Total Storage (in MBs) used for In-house Digital Contents of the Library</b>	About 1800 MB Data stored in Dspace, 10.56 GB data in Koha-ILMS(Bibliographical database)
<b>Bibliographic Records Added to the ILM &amp; DAM Systems of the Library</b>	<p>Out of 6728 records, about 70 entries (consisting 31 Dissertations, 5 Theses, 22 Question papers, 10 Scientist articles, and 2 Annual Reports) were added in DSpace. Altogether 5000 pages of information contents were uploaded, and 446 items of Scientific publications have been corrected.</p>

## New Initiatives taken by the Library:

**IRINS:** ISI have become a member of the Indian Research Information Network System (IRINS) of the UGC-INFLIBNET Centre, Government of India (<http://irins.org/>). Pursuant to the requirements of this Network, we have already created the ISI-Instance (<http://isi.irins.org/>) by updating the information entries to enable an Expert Database called Vidyan. It will provide support to showcase the scientific activities of the Institute by integrating academic identity (via ORCID, Scopus, WoS, Google Scholar) for ingesting the scholarly publications from various sources. This landmark initiative has been recommended by the national and international communities to enhance the visibility of the institutional publications by improving the metadata quality and citation score.



**Collaboration:** To initiate collaboration in the scientific activities **SICI-ISI Membership** have been initiated.

**Recording of Information about the Doctoral Dissertations awarded by the ISI:** A pilot work has already been started for the last twenty years (in coordination with the office of the Dean of Studies).

## Developmental Activities:

- The metadata entries of the Institutional Digital Repository (IDR) have been transformed into a certain quality with an attractive interface for better indexing and retrieval. The CNRI Handler is also enabled with each of the digital-objects (so called bit streams) to ensure persistent identification duly required for long-term preservation. A new API to submit the new publications to the IDR workflow is under development.
- To organize the intellectual assets of the Institute, a pilot has undertaken to record the Library-publications over two decades (i.e. 2001 to 2020), which are enlisted and to be uploaded in due course of time.
- Preservation and conservation: Near about 2000 volumes of journals have been sent for binding this year which were pending for several years
- RemoteXs: The library has extended the off-campus access to its' users i.e. faculty, students and other staff members of the HQ and its branches/centers by providing the access of subscribed e-resources through off-campus mechanism with the help of RemoteXs
- Plagiarism Software: The Library has subscribed to Urkund/iThenticate - an anti-plagiarism software which has been extended to the Faculty, Researches of the HQ and its branches/centers
- Cleaning and arrangement and reorganization of library spaces
- Up-gradation of ILS using Koha (18.11)



Workshope on Copyright and Licencing Modality in Library



Multimedia Training Programme



## Projects

### Ongoing Project: Internally funded

Sl. No.	Name of the project	Starting Date	End Date	Principal Investigator(s)
1	Arrangement & computerization of digitized archival collection of the P.C.Mahalanobis Memorial Museum & Archives	April 1, 2019	March 31, 2021	Kishor Chandra Satpathy

### Activities organized by the Library:

One day workshop titled “Copyright and Licensing Modalities in the Digital Era: Trends, Practices & Prospects” on 13<sup>th</sup> February, 2020

#### User Awareness Programs:

- User Orientation Program entitled “IEEE Xplore Digital Library: Delivering Research Better than Ever” on 28th June 2019
- User Orientation Program entitled “Increase Research Productivity by Exploring Oxford Journals” on 2 July 2019
- Workshop Cum Demonstration on Specialized Scanners for Archives entitled “Digitization: A Different Perspective” on 15th July 2019
- User Orientation Program entitled “Cambridge Core: The home of academic content” on 28th August 2019
- User Awareness Program entitled “Econlit with Full-text Database” on 25th September 2019
- User Orientation Program titled “Streaming Research Workflow using SCOPUS” by Vishal Gupta, Elsevier on 9th December 2019
- User Awareness Programme-Lecture by Paromita and Priyanka Chatterjee of Digital Commons, Elsevier on “Digital commons-Next Generation Institutional Repository” on 24th February 2020

#### Exhibitions and Displays:

- On the occasion of 100 years of Jallianwala Bagh Tragedy Library exhibited a poster display highlighting Tagore’s agony in the writings of Prasanta Chandra Mahalanobis titled as “Sammaner Abhijan jakhan Lajjai Molin” in April 2019
- Display of books of J B S Haldane from 24th April 2019 to 23rd May 2019
- On the occasion of the 126th Birth Anniversary of Prof. P C Mahalanobis & 125th Birth Anniversary of Prof. S N Bose, library organised an exhibition titled “PCM and Satyendra Nath Bose : an eternal tie ” and displayed books of S N Bose and P C M and Scientific Publications of P C Mahalanobis on 29th June 2019 (from 29th June ‘19 – 28th July 2019)
- Exhibition and book display on the occasion of the science outreach event “Astro- scope for the Youngsters: a space odyssey” during 11th November to 15th December 2019.



Students from Gauhati University



Students from NEHU

# COMPUTER AND STATISTICAL SERVICE CENTRE (CSSC), Kolkata

**Head of Unit:** DEBA PRASAD MANDAL

**Office:** 4th floor, S.N. Bose Bhawan, ISI, Kolkata-700 108

The Computer and Statistical Service Centre (CSSC) is responsible for managing, maintaining and upgrading the IT infrastructure of the Institute, including servers for computing, server virtualization (cloud), relevant software, campus-wide networking (wired and wi-fi), Internet security, IP Telephony, Video conferencing, e-library and internet facilities (NKN - 1 Gbps), and Site-to-Site Virtual Private Network (VPN) connectivity with Bengaluru, Delhi, Chennai and Tezpur Centres and the Giridih Unit. Computing laboratories are available for use by students of the Kolkata campus and for conducting classes of regular programmes like B.Stat., M.Tech.(CS), M.Tech. (QR&OR), M.S. (QE), M.Stat. throughout the year. Regular classes are also conducted at other centres via video conferencing facilities. The acquisition and distribution of Laptops and Desktops to faculty, scientific staff and research scholars in Kolkata and Giridih are also managed by CSSC.

## Existing Resources

### Servers

- Four (04) UCS Blade Servers with total 528 Logical CPU and 5TB RAM maintaining Virtual Infrastructure of the Institute.
- One (01) UCS Blade Server with 104 CPU and 1 TB RAM and 3 Nos. of Nvidia GPU Card for GPU Computation.
- Matlab Server
- ISILON Storage with 390 TB for NFS Storage for all Server and Users data.

### Virtualization

- Four (04) Nos. of VMWare Esxi 6.5 installed in Four Blade Server for VM for Computational, Website, Mail and Library.

### Networking

- 1 Gbps NKN Backbone for Internet Connectivity.
- One Core switch (Cisco Nexus 7009) for L3 networking and DMZ.
- One L3 switch each in all the buildings in the campus connected to the Core switch via Fiber channel.
- Hostels are connected to the Core Switch via Fiber channel.
- The entire Kolkata campus is covered with Wi-Fi connectivity.
- Servers and storage at CSSC are connected internally with 10Gbps Backbone.

### Software for use by students, faculty and CSSC

- Matlab, R, Sage, Mathematica, Magma, Python, Cuda, C, Java, SPSS & AMOS.

### IP Telephony

- IP Telephone Router through which all telephones in Kolkata Campus are routed to BSNL.
- VoIP Telephone System for communication within Kolkata Campus and with Bengaluru, Delhi, Chennai and Tezpur Centres and the Giridih Unit through VPN for zero cost Internal Telephone System.

### Video-conferencing

- Five Video Conferencing Systems, One Cisco Meeting Server, One Cisco WebEx Subscription.

### Internet Security

- Firewall/ Proxy Server with packet filtering, MAC based Wifi Authentication, SSL Certificate for encryption.

**VPN Connectivity**

- All the Centres (Bengaluru, Delhi, Chennai and Tezpur) and the Giridih branch are Connected with VPN which enable them to utilize the computational facility, FACT server, Library resources and all software resources available in Kolkata Campus.
- A Linux based Gateway server for users to avail the computational facility from outside the ISI network.

**Computing Laboratories**

Two Computing Laboratories in CSSC having total capacity of 54 users and projector connectivity. These rooms are also used for Computer Laboratory Classes.

**Resources Acquired in 2019-20**

**Softwares**

Renewal of Matlab R2020a licenses for 30 Users, IBM SPSS 26.0 for 10 Users with SPSS AMOS 26.0 for 1 User, Microsoft Office 2019 for 50 Users, PlusTV Digital Signage Software for 6 Displays

**Video-conferencing**

One VC System having ceiling mounted Noise Cancellation Microphone and Dual Display (at Director’s Meeting Room); Two HDMI Cameras installed with existing VC setup at CSSC, One Full HD Projector along with two 55” Display Systems (in the PJAB Auditorium), One Ceiling Microphone for VC room

**Campus-wide Networking**

Network Laying for Uplink in the 6th Floor R.A.Fisher and 4th Floor Kolmogorov Bhawan; Network laying for Smart Displays installed in the SN Bose Bhavan, CD Deshmukh Bhavan and PJA Building; Network Laying in Engineering unit, CSSC VC Room, EML workshop and EMU office.

**VPN Connectivity**

Configured VPN with ISI Giridih in place of P2P Line between ISI Kolkata and ISI Giridih.

**Computing Laboratories**

Renovation of one VC Room with a seating capacity of 58 people having computer facility with LAN connectivity, suitable for VC meetings, seminars, computer laboratory classes and online examinations.

**Disbursal of Desktops/Laptops**

Procured and disbursed 63 Laptops among the Research Scholars of the Institute who joined in 2019 and 44 Desktops among different administrative departments.



# ACADEMIC CENTRES

- **Centre for Soft Computing Research: A National Facility (CSCR)**

In-Charge: ASHISH GHOSH (till September 18, 2019)

KUNTAL GHOSH (September 19, 2019 onwards)

Number of Faculty: Four (4)

Number of Research Scholars: Nine (9)

Office: 1st Floor, R. A. Fisher Bhavan, ISI, Kolkata-700 108

- **Centre for Artificial Intelligence and Machine Learning (CAIML)**

Centre Head: NIKHIL RANJAN PAL

Number of Faculty: Twelve (12) from different units across divisions in ISI

Office: 1st Floor, R. A. Fisher Bhavan, ISI, Kolkata-700 108

- **R. C. Bose Centre for Cryptology and Security (RCBCCS)**

Centre Head: BIMAL ROY

Number of Faculty: Four (4)

Number of Research Scholars: Eleven (11)

Office : 3rd Floor, Deshmukh Bhavan, ISI, Kolkata 700 108

# Centre for Soft Computing

## Research: A National Facility (CSCR), Kolkata

A *National Facility* was established at the Indian Statistical Institute, Kolkata in 2005 by the Department of Science & Technology (DST), New Delhi under its prestigious IRHPA program. The Centre has been declared an Associate Institution of ISI in 2010. Research activities conducted in different areas of soft computing (SC) including their hybridizations are both fundamental and applied in nature. Various fore-front application areas considered include computational theory of perception and Z-numbers, computing with words and cognitive machine, data science and big data analysis, bioinformatics, cognitive science including studies on small animals, cybernetics, assistive technology, psychophysics, plant perception, video analysis, safety analytics, hyper-spectral image analysis, social network analysis, granular mining and big data, swarm intelligence, neural computation and deep learning, rough-fuzzy computing and climate informatics.

### Current Areas of Research

Name	Research topic(s)
Ashish Ghosh	Deep Learning; Data Science and Machine Learning, Automated Pollution Prediction, Rainfall Prediction
Kuntal Ghosh	Cognitive Science, Cybernetics and Computational Biology Complex Network Analysis and Data Mining; Information Technology for Accessibility and Health Care Applications
Sankar K. Pal (Emeritus Professor & National Science Chair)	Granular Computing, Deep Learning and Data Analytics: Integration, Interpretability and Trustability
Shubhra Sankar Ray	Bioinformatics, Machine Learning

### Projects

#### Ongoing Projects: Externally Funded

Sl. No.	Name of the project	Starting Date	Duration	Principal Investigator(s)	Funding agency
1	Understanding vision from filling in and visual illusion perspectives with the help of computational modeling	30.11.2017	3 years	Kuntal Ghosh	Cognitive Science Research Initiative, Dept. of Science and Technology, Govt. of India
2	Development of computer vision-based 3D Indian sign languages recognition to assist differently abled	06.11.2017	3 years, 6 months	Sandipa Roy (Mentor: Dr. Kuntal Ghosh)	Department of Science and Technology, Govt. of India
3	Networking on Data Science and Machine Learning	23.01.2019	3 years	Ashish Ghosh	Department of Science and Technology, (ICPS Division), Govt. of India
4	Coordination of Cluster Projects under Data Science Research	23.01.2019	3 years	Ashish Ghosh	Department of Science and Technology, (ICPS Division), Govt. of India
5	Influence of socio-economic status in the relationship between central obesity and cognitive development of school children of Kolkata, India and the changes in serum leptin and insulin resistance in different grades of central obesity	17.08.2018	2.5 years	Dr. Satabdi Ghosh (Mentor: Dr. Kuntal Ghosh)	Science and Engineering Research Board, Dept of Science and Technology, Govt. of India
6	INSA Distinguished Professor	01.10.2018	3 years	Sankar Kumar Pal	Indian National Science Academy New Delhi

The following programmes were organized during the last financial year (2019-2020):

- (i) International Workshop on Advanced Machine Learning Techniques for Climate Informatics during November 4 to 6, 2019
- (ii) A lecture on 'Visual illusions of angle as an application of Lie transformation groups: A brief mathematical exploration' by Dr. Sauvik Mukherjee on Jan 06, 2020
- (iii) 4th International Conference on Computational Intelligence and Networks (CINE 2020) during Feb 27-29, 2020.

## New Centre for Artificial Intelligence and Machine Learning (CAIML), Kolkata

A new centre for Artificial Intelligence and Machine Learning (CAIML) has been established in 2019 with a mission to leverage the multi-disciplinary nature of research and teaching at the Indian Statistical Institute (ISI) to establish a world class pan-India centre of excellence for research, development, teaching, and training in Artificial Intelligence (AI), Data Science (DS), and related areas. The centre is adorned by a set of eminent international AIML experts as advisors. The centre aims to use Machine Learning, Artificial Intelligence and Data Science as transformative technologies for human welfare and knowledge economy, thereby helping the nation in achieving its sustainable development goals.

The activities of CAIML are organized under the following four major verticals:

- (i) Research,
- (ii) Training and short-term course,
- (iii) Collaboration and
- (iv) Industry Liaison.

During the last financial year (2019-2020), the faculty members participated in organizing research, consultancy projects, and manpower development program taken up by the centre. The following programmes were organized:

- (i) A short course on **Machine Learning for practitioners**: Twenty-two participants from all over the country joined the week-long course (Nov 18-23, 2019) that provided training in ML theory as well as applications.
- (ii) A lecture on '**Delivering successful Data Science based services for the enterprise**': delivered by Partha Dutta, Head of Data Science, Sembcorp Industries Ltd., Singapore on 19 Dec, 2019.
- (iii) An **Indo-French joint workshop on Statistics and AI for Data Science (SAIDS)**: The international workshop was joint organised by CAIML in ISI and several French Institutes together under the patronization of the Indo-French Centre for Applied Mathematics (IFCAM) and held during Jan 13-17, 2020. Fourteen eminent speakers from Academia as well as Industry labs delivered lectures. About one hundred participants including research scholars, faculty members and industry practitioners attended the 3-day workshop.



*Inauguration programme of the IFCAM workshop on Statistics and Artificial Intelligence for Data Science (SAIDS), Jan. 13-17, 2020.*



*A section of the participants and speakers at the IFCAM workshop on Statistics and Artificial Intelligence for Data Science (SAIDS), Jan. 13-17, 2020.*

# R. C. BOSE CENTRE FOR CRYPTOLOGY AND SECURITY (RCBCCS), Kolkata

The Centre aims at the promotion of interdisciplinary research in Mathematics, Computer Science and Statistics towards furtherance of teaching, research as well as training and development in Cryptology and Cyber Security. It acts as a national hub for cryptographic requirements, cutting-edge research activities and indigenous capacity building in all relevant fields of study. It also conducts training programs targeted to produce a critical mass of experts to cater to the national and international requirements in this niche area.

## Research

The faculty members affiliated with the Centre work on various research topics in the domain of Cryptology and Security. The members of the Centre are also actively involved in sponsored research projects, funded by Government organizations as well as the Industry, in niche domains of the subject. The research programmes focus on the theoretical as well as the applied aspect of Cryptology and Security research.

## Academics

The Centre offers short-term (one semester) certificate course on the basics of Cryptology, Security and allied disciplines for Government officials and scientists. The Centre also offers short-term intensive workshops or lecture series on specialized topics related to Cryptology and Security.

The faculty members of the Centre supervise Post-graduate students of any discipline of the Institute in the domain of Cryptology and Security, and also offer guidance to full-time PhD candidates in Cryptology and Security selected through the usual JRF exam and interview process of the Institute. Cryptology and Security Research Unit (CSRU) is the only unit of R. C. Bose Centre for Cryptology and Security, which belongs to Computer and Communications Sciences Division (CCSD). Detailed academic activities of CSRU have been reported under CCSD.

## Activities of the Centre during 2019-2020

- A **3 years R&D project on Cybersecurity** for National Technology Research Organization (NTRO) has been initiated since November, 2019 with a funding of Rs.9 crores.
- A **4 week long training program for CRPF officers on Cybersecurity** was conducted during March, 2020. However, the last week of the program has been deferred due to the pandemic situation.



# 04

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## AWARDS AND RECOGNITIONS



### Science Academy Fellowships - 7

**National-6**

**International-1**



### Awards - 16

**Shanti Swarup Bhatnagar Prize in Mathematical Sciences -1**

**NASI Young Scientist Platinum Jubilee Award - 1**

**IISA Young Statistical Scientist Award - 2**

**Other Awards - 12**

Members of the Faculty of this Institute have been recognized, both nationally and internationally, for their contributions to research and other academic activities. Like every year, some faculty members have received prestigious awards and honours, in recognition of their excellence in their areas of expertise. Many of them have been elected members of learned societies while many others have taken up the academic responsibility of serving the editorial board of prestigious national and international peer reviewed journals. Their achievements are highlighted below-

## 4.1 Science Academy Fellowships (National and International)

### INDIAN NATIONAL SCIENCE ACADEMY (INSA)

Ritabrata Munshi, SMU Kolkata

Fellow, 2019

### INDIAN ACADEMY OF SCIENCES (IAS, Bengaluru)

Rajat S. Hazra, SMU Kolkata

Fellow 2019

### NATIONAL ACADEMY OF SCIENCES, INDIA (NASI, Allahabad)

Ashish Ghosh, MIU, Kolkata

Fellow, 2019

### NATIONAL ACADEMY OF AGRICULTURAL SCIENCES (NAAS)

Arunava Goswami, AERU Kolkata

Fellow, 2019-2020

### WEST BENGAL ACADEMY OF SCIENCES (WAST)

Banasri Basu, PAMU Kolkata

Fellow 2019

Saurabh Ghosh, HGU Kolkata

Fellow 2019

### THE WORLD ACADEMY OF SCIENCES (TWAS)

Sanghamitra Bandyopadhyay, MIU, Kolkata

Fellow 2019



Dr. Neena Gupta Felicited by Chairman, ISI

## 4.2 Awards

### Shanti Swarup Bhatnagar Prize

Neena Gupta, SMU Kolkata

in Mathematical Sciences, 2019

### Swarnajayanti Fellowship

Neena Gupta, SMU Kolkata

(2014-15 to 2019-20)

Parthanil Roy, SMU Bengaluru

(2017-18 to 2022-23)

### J C Bose National Fellowship

Arup Bose, SMU Kolkata

(2019-2023)

B V Rajarama Bhat, SMU Bengaluru

(2017-2022)

Debashish Goswami, SMU Kolkata

(2016-2021)

Sanghamitra Bandopadhyay, MIU Kolkata

(2017-2022)

### National Science Chair, GoI

Partha P. Majumder, Emeritus Professor

(2020-2023)

Sankar K. Pal, CSCR Kolkata, Emeritus Professor and Ex-Director

(2020-2023)

### INAE Chair Professor

Sushmita Mitra, MIU, Kolkata

(2018-2020)

### Mahalanobis Memorial Gold Medal, Indian Econometric Society National award for 2018

Abhiroop Mukhopadhyay, EPU, Delhi

### Srinivasa Ramanujan Medal, INSA, 2019

K.B. Sinha, *Former Director and Emeritus Professor*

### Sir Prafulla Chandra Ray Memorial Medal, University of Calcutta, 2020

Partha Pratim Majumdar, *Emeritus Professor*

### NASI-Young Scientist Platinum Jubilee Award, 2019

Abhik Ghosh, ISRU, Kolkata

(in the field of Earth Science, Mathematics and Physics)

### IISA Young Statistical Scientist Award

Rajat S. Hazra, SMU, Kolkata

(Theory & Methods category, **2020**)

Rituparna Sen, ASU, Bengaluru

(Applications Category, **2019**)

## 4.3 Recognitions

**BIMAL KUMAR ROY**, ASU, Kolkata; *Former Director*  
Chairman, National Statistical Commission, 2019 (Duration: 3 Years)

**PARTHA PRATIM MAJUMZAR**, *Emeritus Professor*  
President, Indian Academy of Sciences, 2019  
Co-chair of WHO Expert Committee on Artificial Intelligence in Healthcare, Ethics, 2019  
D.Sc. (*Honoris causa*), Burdwan University, 2019

**RITABRATA MUNSHI**, SMU, Kolkata  
Adjunct Professor, School of Mathematical Sciences, National Institute of Science Education and Research (NISER)

**A. RAJAGOPAL**, SQC & OR, Coimbatore  
Dynamic Indian of the Millennium Award for the work carried out “Applied Statistical Analytics for Quality, Reliability, Research Methods for Business Process Excellence and Systems” 15-07-2019

**ABHIK GHOSH**, IRSU, Kolkata  
ADB Travel Funding to attend 62nd ISI World Statistics Congress 2019 in Malaysia, Asian Development Bank, 2019

**ASHISH GHOSH**, MIU, Kolkata  
International Association for Pattern Recognition (IAPR) Fellow 2020  
IEEE-GRSS Regional Leader Award from Institute of Electrical and Electronics Engineers (IEEE), 2019

**B. S. DAYA SAGAR**, SSIU, Bengaluru  
IEEE Geoscience and Remote Sensing Society (GRSS) Distinguished Lecturer (DL)  
Frank Harary Endowment Lecturer – 2019, International Conference on Discrete Mathematics, 2019

**BISWANATH DUTTA**, DRTC, Bengaluru  
Secretary, International Society for Knowledge Organization (ISKO) - India Chapter, 2020-

**E.SOMANATHAN**, EPU, Delhi  
Senior Visiting Fellow (Honorary), Centre for Policy Research (CPR) Delhi, 2019

**FARZANA AFRIDI**, EPU, Delhi  
Lead, Academic, International Growth Centre (India program), Since 2020

**KIRANMOY DAS**, IRSU, Kolkata  
Associate, Indian Academy of Sciences, Bengaluru, 2019

**MADHURA SWAMINATHAN**, EAU, Bengaluru  
Ban Ki Moon Award for Women’s Empowerment, Asia Initiatives New York, October 18, 2019  
Part-time non-official Director, Board of Union Bank of India, 2018-20.

**PARTHANIL ROY**, SMU, Bengaluru  
Bernoulli Society Youth Representative, 2017-2020

**RITUPARNA SEN**, ASU, Bengaluru  
Asian Development Bank Travel Award for World Statistics Congress in Malaysia, 2019

**SANGHAMITRA BANDYOPADHYAY**, MIU, Kolkata  
Selected for CEFIPRA 6th Annual Lecture Series delivered in France, October 2019

**SANKAR KUMAR PAL**, CSCR, Kolkata  
Scholar-in-Residence, IIT Jodhpur, Appointed by the Board of Governing Council, IIT Jodhpur, Since 2019

**SATYA RANJAN CHAKRAVARTY**, ERU, Kolkata  
‘The Study of Economic Inequality’ a session organized in honour of Professor Satya R. Chakravarty during the Eighth Conference of the Society, Paris School of Economics, France, 2019

**SIVA ATHREYA**, SMU, Bengaluru  
Chair, Program Committee for IMS/BPS World Conference in Probability, 2020

**SUJATA GHOSH**, CSU, Chennai  
Elected Jury member, E.W. Beth Dissertation Prize, 2019

**SUSHMITA MITRA**, MIU, Kolkata  
Fulbright Nehru Academic and Professional Excellence Fellowship, 2018-2020  
IEEE CIS Distinguished Lecturer, 2020-2023  
Chair Elect, IEEE Kolkata Section, 2019-2020

**SUSHMITA RUJ**, CSRU, Kolkata  
Program co-chair of Indocrypt 2019, 2019

**T. KARTHICK**, CSU, Chennai  
DST-SERB-MATRICES Grant, 2019/ 3 years

## 4.4 Memberships

### A. RAJAGOPAL, SQC & OR, Coimbatore

Member, Board of Studies, Karpagam University, 2019-20  
 Member, Board of Studies, Avinashilingam Deemed University, 2019-20  
 Member, Board of Studies, Bharathiyar University Statistics Department, 2019-20

### ARUP BOSE, SMU, Kolkata

NBHM Board Member, 2019-present  
 Member, West Bengal State Council of Science & Technology 2019-2021  
 Council Member, Bernoulli Society, 2015-2019

### ASHISH GHOSH, MIU, Kolkata

In-charge, ChapNet and Ambassador programs of IEEE Geoscience and Remote Sensing Society, 2020  
 Member, Academic Council, Banasthali Vidyapith, Jaipur, India., 2019  
 Member, IT Projects Advisory Committee of Security and Exchange Board of India (SEBI), Mumbai, GOI, 2019  
 Member of board of studies/research of various Indian institutes  
 Member, NAAC Assessor Committee, Gol, 2019

### B. RAJEEV, SMU, Bengaluru

Member, Academic Council, M.S. Ramaiah University of Applied Sciences, 2019

### DARPA SAURAV JYETHI, TASU, North-East Centre, Tezpur

Member, Diversity Committee, International Society of Exposure Science, 2017 onwards

### DILIP SAHA, GSU, Kolkata

Council Member, Geological Society of India, Bengaluru, 2019-22

### DHURJATI PRASAD SENGUPTA, GSU, Kolkata

Member, Board of Studies, Department of Geology, Presidency University, Kolkata, 2018 - 2020  
 Member, Ph. D, Committee, Department of Geology, Presidency University, 2018-2020  
 Member, Ph. D, Committee, Department of Geology, University of Calcutta, 2019-2020

### E.SOMANATHAN, EPU, Delhi

Member, RWI Research Network, since 2018  
 Appointed member of the eFD Initiative Board, 2019  
 Appointed Senior Visiting Fellow (Honorary), Centre for Policy Research (CPR) Delhi, 2019

### KISHOR C SATPATHY, Library, Kolkata

Expert member, Committee for "Book Selection & Price Negotiation of National Library", National Library, Kolkata, (2019-)  
 Member to the Advisory Committee for Collection Development of Print & E-Resources, National Library, Kolkata (2019-)  
 Expert, Library Automation Project of West Bengal Secretariat Library for the year 2019

### KUNTAL GHOSH, CSCR, Kolkata

Member, Project Review and Steering Group for the Ministry of Electronics & Information Technology (MeitY) project DISAAA: Development of an Integrated Solution for Automatic Assessment of Autism using Visual Attention, Facial Expression and Vocal emotion cues

### MADHURA SWAMINATHAN, EAU, Bengaluru

Appointed Member, Appeals Committee, National Assessment and Accreditation Council, 2018 onwards.  
 Appointed Member, Governing Body, Institute for Social and Economic Change, Bengaluru, 2019-21.  
 Appointed Member, Executive Committee of the Indian Society of Agricultural Economics, 2019-20  
 Appointed Member, Council of Advisors, World Food Prize, Iowa, USA, 2019-21

### MUDIT KAPOOR, EPU, Delhi

Member, NITI Aayog Committee to look into the reforms in the Data Management system in Health sector  
 Technical Advisory Group Member, NITI Aayog Committee for National Data Analytics Platform

### NILADRI SEKHAR DASH, LRU, Kolkata

Technical Advisor, Digitization of Sarala Mahabharata by Manuscript Section of the State Museum, Govt of Odisha, from 2020  
 Member of Board of Studies, MA Linguistics Programme, CAS in Linguistics, Annamalai University, Tamil Nadu, 2020-2022

### PARTHA SARATHI MUKHERJEE, ISRU, Kolkata

Member, 2019 Wilcoxon and Youden Prize Committee, Technometrics, January-July 2020

### RITABRATA MUNSHI, SMU, Kolkata

Executive Committee of the Ramanujan Math Society 2017-present

### RITUPARNA SEN, ASU, Bengaluru

Member of Council, International Society for Business and Industrial Statistics (ISBIS), 2019

### SIVA ATHREYA, SMU, Bengaluru

Chair of Program Committee for IMS/BPS World Conference in Probability, 2020

### SUSHMITA MITRA, MIU, Kolkata

Member, Sectional Committee II, and several other Selection/Awards committees, INAE, 2017 to date  
 Expert Member, EMR, SERB, DST, 2018 to date  
 Member, IEEE Award Committee, 2017-2019  
 Member, Engineering Sciences Research Committee, CSIR, 2019 to date  
 Member, Board of Studies, Tezpur University & Govt. College of Ceramic Technology, 2017 to date  
 Member, IEEE CIS Fellow Evaluation Committee, 2020

## 4.5 Editorial Assignments

**ABHIK GHOSH**, ISRU, Kolkata  
Technical Editor, *Sankhya*, Series A & B, 2019-2021

**ANTAR BANDYOPADHYAY**, SMU, Delhi  
Associate Editor, *Journal of Statistical Planning and Inference (JSPI)*, Elsevier and *Sankhya* Series A

**ANUP DEWANJI**, ASU, Kolkata  
Associate Editor, *Journal of Statistical Planning and Inference*, Elsevier.

**ARUNAVA SEN**, EPU, Delhi  
Associate Editor, *Economic Theory; Social Choice and Welfare; Mathematical Social Sciences; Review of Economic Design*  
Advisory Editor, *Journal of Mathematical Economics*

**ASHISH GHOSH**, MIU, Kolkata  
Associate Editor, *Journal on Banking and Financial Technology (JBFT)*, Springer Nature; *Sadhana (Computer and Data Sciences)*, Springer Nature; *IET Journal of Computer Vision and Indian Statistical Institute Series*, Springer Nature.  
Series Editor, *Communications in Computer and Information Science (CCIS)*, Springer Nature.  
Guest editor, special issue of Applied Soft Computing with selected papers from PReMI, 2019, 2019  
Member Editorial Board, *CAAI Transactions on Intelligence Technology (published from IET)* and *International Journal of Knowledge Engineering and Soft Data Paradigms*.

**AYANENDRANATH BASU**, ISRU, Kolkata  
Associate Editor, *Computational Statistics*, 2015 onwards  
Member, Editorial Advisory Board, *Journal of Applied Statistics*, 2013 onwards

**BHABATOSH CHANDA**, ECSU Kolkata  
Associate Editor, *Pattern Recognition*, Elsevier,  
Editorial Advisory Board *Mathematical Morphology - Theory and Applications*, De Gruyter

**BISWANATH DUTTA**, DRTC, Kolkata  
Secretary, International Society for Knowledge Organization (ISKO) - India Chapter, 2020-  
Editorial Board Member, *International Journal of Metadata, Semantics and Ontologies*, since 2018 -

**B. S. DAYA SAGAR**, SSIU, Bangalore  
Editor-In-Chief: *Encyclopedia of Mathematical Geosciences*, Springer  
Associate Editor: Springer Indian Statistical Institute Series  
Review Editor: *Frontiers: Environmental Informatics*  
Editorial Advisory Board Member: *Computers & Geosciences, Mathematical Geosciences*

**DEBASIS MISHRA**, EPU, Delhi  
Associate Editor, *Social Choice and Welfare*, Springer, since 2016;  
*Mathematical Social Sciences*, Elsevier, since 2014; *Journal of Mechanism and Institution Design*, since 2016; *Games and Economic Behaviour*, Elsevier, Since 2019

**DILIP SAHA**, GSU, Kolkata  
Section Editor, *Current Science*, 2019-20

**DIPTI PRASAD MUKHERJEE**, ECSU Kolkata  
Associate Editor, *IEEE Transactions on Image Processing*, since November 2014; *IET Image Processing*, since February 2016;  
*SADHANA, Academy Proceedings in Engineering Sciences*, Springer, since June 2014.

**E.SOMANATHAN**, EPU, Delhi  
Co-Editor, *Environment and Development Economics* (Cambridge University Press), 2020

**E V GIJO**, SQC&OR Unit, Bengaluru  
Editorial Advisory Board Member, *International Journal of Lean Six Sigma*, Last 4 years  
Editorial Advisory Board Member, *International Journal of Quality & Reliability Management*, Last 3 years

**FARZANA AFRIDI**, EPU, Delhi  
Editorial Board Member, 'Sarvekshana', the official journal of the National Sample Survey Organization of India, Ministry of Statistics and Program Implementation, 2019-2024

**JAYDEB SARKAR**, SMU, Bengaluru  
Editorial Board Member, *Indian Journal of Pure and Applied Mathematics*, 2020

**JIBAN K. PAL**, Library, Kolkata  
Honorary Member, Board of Editors, Re3data.org (Registry of Research data Repositories), a global registry for an open-data initiative funded by German Research Foundation (DFG).

**MALAY BHATTACHARYYA**, MIU, Kolkata  
Editorial Board Member, *Human Computation* (ISSN# 0972-7272), 2019-20

**NILADRI SEKHAR DASH**, LRU, Kolkata  
Editor-in-Chief, *Journal of Advanced Linguistic Studies*, since 2010  
Editorial Board Member, *Language Forum* (ISSN: 0253-9071), since 2012  
Editorial Board Member, *Journal of ELT and Applied Linguistics* (ISSN: 2347-6575), since 2012  
Editorial Board Member, *Indian Journal of Applied Linguistics* (ISSN: 0379-0037), since 2014  
Editorial Board Member, *The Journal of AsiaTEFL* (e-ISSN 2466-1511), since 2015  
Editorial Board Member, *SN Social Sciences* (ISSN: 2662-9283), since 2020

**PRABAL ROY CHOWDHURY**, EPU, Delhi  
Chief Editor, *Indian Growth and Development Review*  
Editor, *CCI Journal on Competition Law and Policy*, Competition Commission of India

**RITABRATA MUNSHI**, SMU, Kolkata  
Chief Editor, *Journal of the Ramanujan Math Soc*  
Editor of the *Hardy-Ramanujan Journal*

**RITA SAHARAY**, ISRU, Kolkata

Associate Editor, *Journal of Indian Society of Agricultural Statistics*, June 2014 onwards

Associate Editor, *Sankhya*-Series A, April 2016 onwards,

**RITUPARNA SEN**, ASU, Bengaluru

Associate editor, *Applied Stochastic Models in Business and Industry*

Associate editor, *Sankhya* Series B

**SANKAR KUMAR PAL**, CSCR, Kolkata

Emeritus Professor; Ex-Director

Associate Editor, *Information Sciences* (Elsevier), *Fuzzy Sets and Systems* (Elsevier), *Fundamenta Informaticae* (IOS Press), *Int. J. Pattern Recognition and Artificial Intelligence* (World Scientific), *Int. J. Computational Intelligence and Applications* (World Scientific), *IET Image Processing* (IEE Press), and *LNCS Trans. on Rough Sets* (Springer).

Editor-in-Chief, *International Journal of Signal Processing, Image Processing and Pattern Recognition*, SERSC, Korea,

Executive Advisory Editor, *International Journal of Approximate Reasoning*, *International Journal of Computational Science and Engineering*, *International Journal of Business Intelligence and Data Mining*, *International Journal of Machine Intelligence and Sensory Signal Processing*.

**SARBANI PATRANABIS DEB**, GSU, Kolkata

Editor, *Geological Magazine*, Cambridge University Press, UK, 2017-2020

**SUDHEESH K KATTUMANNIL**, ASU, Chennai

Associate Editor, *Journal of the Indian Statistical Association*, since 2020

**SUSHMITA MITRA**, MIU, Kolkata

Founding Associate Editor, *Wiley Interdisciplinary Reviews on Data Mining & Knowledge Discovery*, 2008 to date

Associate Editor, *Neurocomputing*, 2005-2019; *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 2010 to date; *Information Sciences*, 2013 to date; *INAE Letters & Transactions of INAE*, 2016 to date

**SUSMITA SUR-KOLAY**, ACMU, Kolkata

Associate Editor *ACM Transactions on Embedded Computing Systems*.

**SWAGATAM DAS**, ECSU, Kolkata

Associate Editor, *IEEE Transactions on Cybernetics*, (2020 - ); *Pattern Recognition*, (2017 - ); *Information Sciences*, (2010 - ); *Neurocomputing*, (2013 - )

Editorial Board Member, *Applied Soft Computing*, (2018 - ); *Information Fusion*, (2020 - )

Co-Editor-in-Chief, *Swarm and Evolutionary Computation*, (2011)

Editor, *Engineering Applications of Artificial Intelligence*, (2013 - )

**TAPAN CHAKRABORTY**, GSU, Kolkata

Editorial Advisory Committee Member, *Indian Journal of Geosciences*; ISSN 22293574, 2018-2020

**UMAPADA PAL**, CVPR, Kolkata

Associate Editor, *Pattern Recognition*, Elsevier, since 2016; *Pattern Recognition Letters*, Elsevier, since 2014; *ACM Transactions on Asian and Low-Resource Language Information Processing (TALLIP)*, ACM, since 2012; *IET Biometrics*, IET, since 2016; *International Journal of Document Analysis and Recognition*, Springer, since 2015.

**UTPAL GARAIN**, CVPR Kolkata

Associate Editor *International Journal of Document Analysis and Recognition*, Springer, since 2011.

**YOGESHWARAN DHANDAPANI**, SMU, Bengaluru

Editorial Board Member, *Journal of Applied and Computational Topology*, 2019



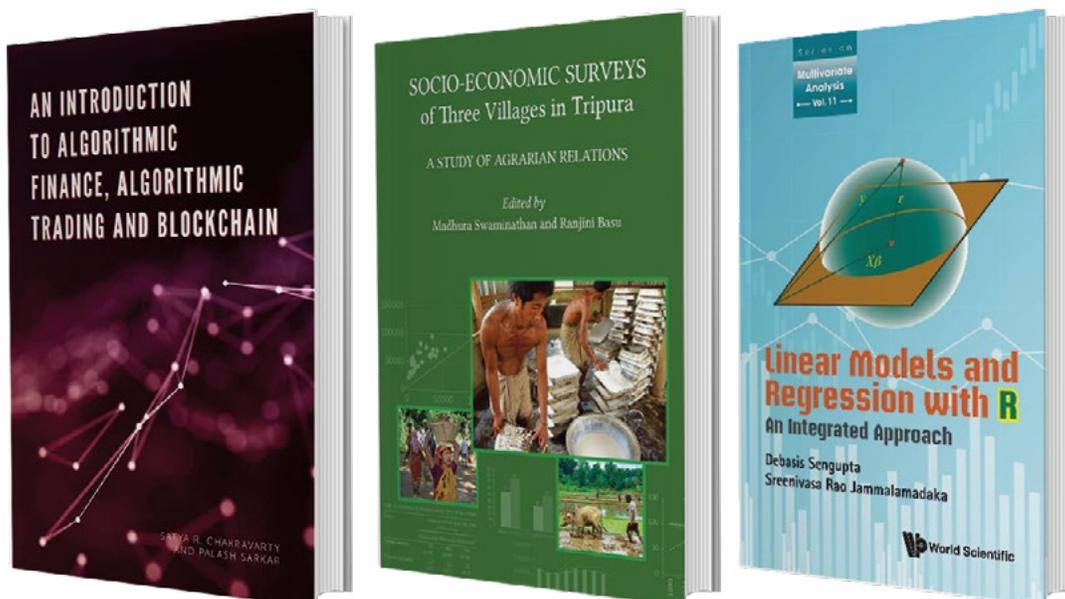
# 05

## PUBLICATIONS

	Book & Book Chapters	Conference Proceedings	Journals	Total
 <b>Applied Statistics Division</b>	3	4	52	59
 <b>Biological Sciences Division</b>	3	---	64	67
 <b>Computer and Communication Sciences Division</b>	4	95	113	212
 <b>Library, Documentation and Information Science Division</b>	---	3	5	8
 <b>Physics and Earth Sciences Division</b>	5	---	76	81
 <b>Social Sciences Division</b>	9	---	56	65
 <b>Statistical Quality Control and Operations Research Division</b>	---	---	32	32
 <b>Theoretical Statistics and Mathematics Division</b>	---	2	56	58
 <b>Center for Soft Computing Research</b>	---	3	7	10
<b>Total</b>	<b>24</b>	<b>107</b>	<b>461</b>	<b>592</b>

## 5.1 PUBLICATIONS IN BOOKS & BOOK CHAPTERS

### Books



- Chakravarty, S.R. and **Sarkar, P.** *An Introduction to Algorithmic Finance, Algorithmic Trading and Blockchain*, Emerald Publishing Limited, UK, 208 pages, 2020. ISBN: 9781789738940 [ASU, Kolkata]

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- Ramachandran, V.K., **Swaminathan, M.** and Basu, R. (eds.) *Socio-Economic Surveys of Three Villages in Tripura: A Study of Agrarian Relations*, Tulika Books, New Delhi, 400 pages, 2020. ISBN: 9788193732946 [EAU, Bengaluru]

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- **Sengupta, D.** and Jammalamadaka, S.R. (2019) *Linear Models and Regression with R: An Integrated Approach*, World Scientific, Singapore, 772 pages, 2019. ISBN 978-981-120-040-3 [ASU, Kolkata]

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\* Names in bold denotes ISI faculty

### Book chapters

#### Applied Statistics Division (ASD)

1. Ghosal, S., **Purkayastha, S.** and Ramamoorthi, R.V. Ghosh, Jayanta Kumar, In: *Wiley Stats Ref: Statistics Reference Online, John Wiley & Sons*, Davidian, M., Kenett, R.S., Longford, N.T., Molenberghs, G., Piegorsch, W. and Ruggeri, F. (eds.), 2019. ISBN: 9781118445112 [ASU, Kolkata]

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#### Biological Sciences Division (BSD)

2. Hazra, A., Dasgupta, N., Sengupta, C., Bera, B. and **Das, S.** Tea: A Worthwhile, Popular Beverage Crop since Time Immemorial, *Agronomic Crops; Volume 1: Production Technologies*, Hasanuzzaman, M. (ed.), Springer Nature, Singapore, 507-531, 2020, Print ISBN 978-981-32-9150-8 [AERU, Kolkata]

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3. Kunda, P., **Mukherjee, A.** and Dhal, P.K. Bacterial biological control agents for soil-borne diseases management in pulses: Present status and future prospects, *Microbial Mitigation of Stress Response of Food Legumes*, Amaresan N., Kumar, M.S., Kumar, K. and Sankaranarayanan, A. (eds.), CRC Press, Boca Raton, FL, 231-241, 2020, ISBN 9780367460242. [AERU, Giridih]

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4. **Mukhopadhyay, B.** Issues in Research Ethics in Biological Anthropology: Some Observations, In: *Ethics and Objectivity in Anthropology*, Mishra, P.K. (ed.) Indian National Confederation and Academy of Anthropologists, Jhargram, West Bengal, 180-190, 2020, ISBN 978-93-83088-25-6. [BAU, Kolkata]

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## Computer and Communication Sciences Division (CCSD)

5. Bhagat, S., **Mukhopadhyaya, K.**, Mukhopadhyaya, S. Computation under Restricted Visibility, In: *Distributed Computing by Mobile Entities: Current Research in Moving and Computing*, Flocchini, P., Prencipe, G and Santoro, N. (eds.), Springer, Switzerland, pp: 134-183, 2019. ISBN 978-3-030-11071-0 [[ACMU, Kolkata](#)]
6. Bhattacharya, D., Banerjee, S., Bhattacharya, S., **Uma Shankar, B.** and **Mitra, S.** GAN-based novel approach for data augmentation with improved disease classification, In: *Advancement of Machine Intelligence in Interactive Medical Image Analysis*, Verma, O. P., Roy, S., Pandey, S. and Mittal, M. (eds.), Springer, Singapore, pp: 229-239, 2019. ISBN: 978-981-15-1100-4 [[MIU, Kolkata](#)]
7. Chattopadhyay, S., **Banerjee, A.**, Banerjee, N. and Yu, B. A. Utility-Driven Data Transmission Optimization Strategy in Large Scale Cyber-Physical Systems, In: *Big Data Analytics for Cyber-Physical Systems*, Hu, S. and Yu, B. (eds.) Springer, Switzerland, pp: 13-42, 2020. ISBN 978-3-030-43493-9 [[ACMU, Kolkata](#)]
8. Datta, A., Ghosh, S. and **Ghosh, A.** Hyperspectral Remote Sensing Images and Supervised Feature Extraction, In: *Cloud Computing for Geospatial Big Data Analytics*, Das, H., Barik, R.K., Dubey, H. and Roy, D. S. (eds.) Springer, Cham, Studies in Big Data, Vol. 49, pp: 265-289, 2019. Print ISBN: 978-3-030-03358-3 [[MIU, Kolkata](#)]



## Physics and Earth Sciences Division (PESD)

9. **Chakraborty, T.**, Taral, S., More, S., and Bera, S., (2020) Cenozoic Himalayan Foreland basin: an overview and regional perspective of the evolving sedimentary succession, In: *Geodynamics of the Indian Plate: Evolutionary Perspectives*, Gupta, N. and Tandon, S. K. (eds.), Springer Nature, Switzerland, pp: 395-437, 2020. [https://doi.org/10.1007/978-3-030-15989-4\\_11](https://doi.org/10.1007/978-3-030-15989-4_11) [[GSU, Kolkata](#)]
10. Dey, S. and **Sarkar, S.** Turbulent Length Scales and Reynolds Stress Anisotropy in Wall-Wake Flow Downstream of an Isolated Dunal Bedform, In: *Recent Trends in Environmental Hydraulics*, Kalinowska, M.B., Mrokowska, M.M. and Rowiński, P.M. (eds.), Springer-Verlag, Berlin, pp: 1-21, 2020. ISBN: 978-3-030-37105-0 [[PAMU, Kolkata](#)]
11. **Ghosh, P.** and **Sengupta, D. P.** (2020) Geodynamics of Gondwanaland, In: *Geodynamics of the Indian Plate: Evolutionary Perspectives*, Gupta, N. and Tandon, S. K. (eds.), Springer Nature, Switzerland, pp: 213-232, 2020. [https://doi.org/10.1007/978-3-030-15989-4\\_7](https://doi.org/10.1007/978-3-030-15989-4_7) [[GSU, Kolkata](#)]
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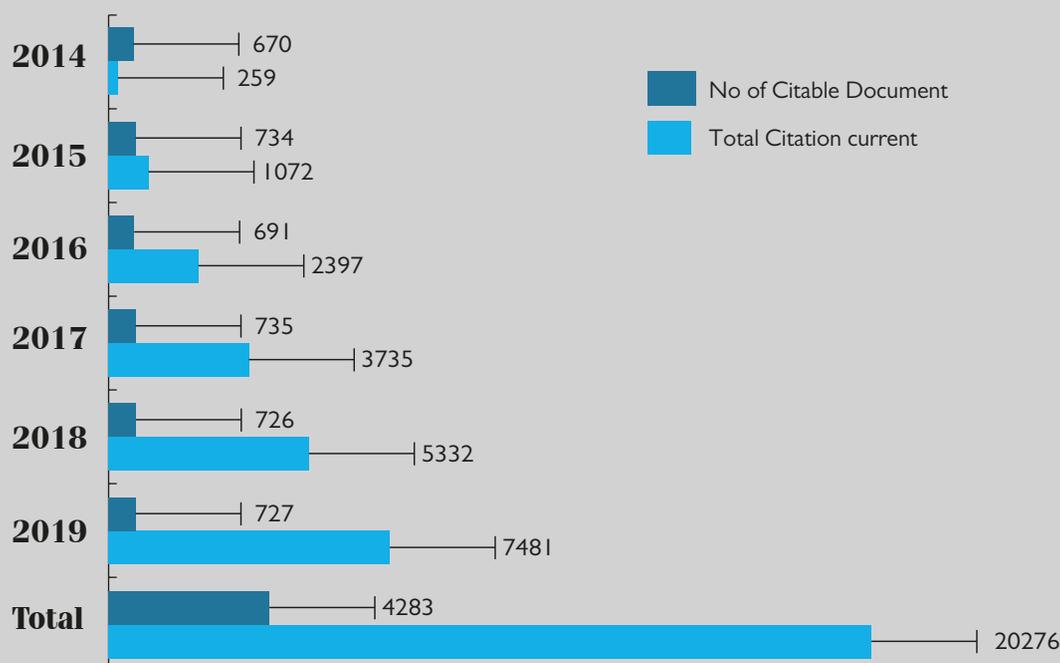
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## Library and Documentation Information Services Division

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## 5.4 Sankhyā

The internationally renowned journal *Sankhyā*, an official publication of the Indian Statistical Institute, was founded by **Professor P. C. Mahalanobis** in 1932 and began publication under his editorship.

This quarterly journal, with ISSN 0976-8378, is devoted to original research articles in Applied Statistics, Mathematical Statistics and Probability. Reviews and discussion articles on current research activity in the above areas are also published. A rigorous peer review process is followed for acceptance of articles submitted for publication in *Sankhyā*. Many seminal articles in Probability, Theoretical Statistics and Applied Statistics have appeared in *Sankhyā*.

The journal is published in two separate series – Series A and Series B.

**Series A**, with 2 issues per year (February and August) covers Probability & Theoretical Statistics.

**Series B**, with 2 issues per year (May and November) covers Applied and Interdisciplinary Statistics.

Beginning 2010, the Institute has been collaborating with Springer for printing and marketing the international edition of *Sankhyā*, in both *prints and electronic editions*. The editorial system is now completely electronic, starting from submission to editorial processing and ending in final editorial decision for articles. Free access to articles of every edition of *Sankhyā* is available through the *Sankhyā* website.

The present **Editorial Board** of *Sankhyā* took over in January 2019 and is as follows:

<b>Editor-in-Chief</b>	⋮	Dipak K. Dey, University of Connecticut, USA
<b>Series A Editors</b>	⋮	Krishna Athreya, Iowa State University, Ames, USA
	⋮	Soumendra Nath Lahiri, Washington University in St. Louis, USA
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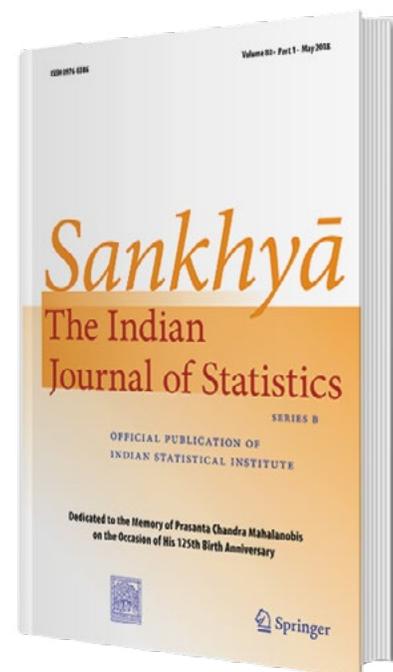
This journal is **abstracted/ indexed in** Current Index to Statistics, EBSCO Discovery Service, Emerging Sources Citation Index, Google Scholar, JSTOR, Japanese Science and Technology Agency (JST), Mathematical Reviews, OCLC WorldCat Discovery Service, ProQuest-ExLibris Primo, ProQuest-ExLibris Summon, Research Papers in Economics (RePEc), SCImago, SCOPUS and zbMATH.

The following four regular issues and one special issue were published during April 2019 to March 2020

Series A - Volume 81, Part II & Volume 82, Part I

Series B - Volume 81, Part I & Volume 81, Part II

A special issue on Econometrics [Series B - Volume 81, Supplement 1] – published in September, 2019 was dedicated to the memory of Prasanta Chandra Mahalanobis, the founder of Indian Statistical Institute and the founder Editor of *Sankhyā*, on the occasion of his 125th birth anniversary. The issue highlights his contributions in the context of current research in Econometrics and includes original contributions on topics of contemporary interest. The list of articles that appeared in the Special Issue: can be accessed via <https://sankhya.isical.ac.in/issues/52>.





# 06

## OTHER ACADEMIC ACTIVITIES



No. of Patents - 10

**Filed-3 (National-2, International-1)**

**Published-2 (International-2)**

**Granted-5 (National-1, International-4)**



No. of MoUs - 52

**New-16 (National-13, International-3)**

**Existing-36 (National-21, International-15)**



No. of Visiting Scientists - 216

**National-139**

**International-77**

## 6.1 IPRs Patents

### IPRs Filed (2019-2020)

SI no.	Title of Patent	Application No.	Date of filing	Name of the Inventor(s)*	Status	Whether filed National/ International	If International, Country name
1	Development of cheap, efficient, non-toxic antisprouting agents of potato using organic compounds	202031000486	<b>06-Jan-2020</b>	<b>Suparna Mandal Biswas (AERU)</b> and Panchanan Pramanik	Filed	India	
2	Tube Inspection System	WO2019219956A1	<b>21-Nov-2019</b>	Akshay Chaturvedi, <b>Utpal Garain (CAIML)</b> , Anabik Pal, S. Somasundaram, Supriya Sarkar	Filed	International	EPO
3	Method and System for Region Proposal based Object Recognition for Estimating Planogram Compliance	201921028670	<b>13-Dec-2019</b>	Avishek Kumar Shaw, Rajashree Ramakrishnan, Shilpa Yadukumar Rao, Pranoy Hari, <b>Dipti Prasad Mukherjee (ECSU)</b> , Bikash Santra	Filed	India	
4	Systems and methods for obtaining optimal mother wavelets for facilitating machine learning tasks	EPI8204017.0	02-Nov-2018	Ishan Sahu, Snehasis Banerjee, Tanushyam Chattopadhyay, Arpan Pal, and <b>Utpal Garain (CCSD)</b>	Publication date: <b>03-Jul-2019</b> Publication No.: EP3506125A1	International	Europe
5	Systems and methods for obtaining optimal mother wavelets for facilitating machine learning tasks	US16/179,771	02-Nov-2018	Ishan Sahu, Snehasis Banerjee, Tanushyam Chattopadhyay, Arpan Pal, and <b>Utpal Garain (CCSD)</b>	Publication date: <b>04-Jul-2019</b> Publication No.: US0205778 A1	International	USA

\* Name in bold denotes ISI faculty

### IPR Granted (2019-2020)

Sr. no.	Title of Patent	IPR No.	Grant Date	Name of the Inventor(s)*	Whether filed National/ International	If International, Country name
1	Method and system for recommending features for developing an IoT application	US10277682B2	30- Apr- 2019	Swagata Biswas, Tanushyam Chattopadhyay, Arpan Pal, Snehasis Banerjee, and <b>Utpal Garain(CVPR)</b>	International	United States
2	System and Method for Object Recognition based Estimation of Planogram Compliance	AU2017342154B2	25- Jul- 2019	Pranoy Hari, Shilpa Yadukumar Rao, Rajashree Ramakrishnan, Avishek Kumar Shaw, Archan Ray, Nishant Kumar, <b>Dipti Prasad Mukherjee (ECSU)</b>	International	Australia
3	Biomarker and an in-vitro method for head & neck cancer prognosis	201811018135	22- Nov- 2019	S Pradhan, S Roychoudhury, S Ganguly, R Kannan, A Chaudhry, S Tripathy, S Dey, R Munde, D Datta De, <b>Indranil Mukhopadhyay (HGU)</b> , RF Chinmoy	India	
4	Data partitioning in Internet-of-Things (IoT) Network	US1051672B2	12- Dec- 2019	Himadri Sekhar Paul, Arijit Mukherjee, Swarnava Dey, Arpan Pal and <b>Ansuman Banerjee (CCSD)</b>	International	United States
5	Approximate computing for application performance in systems	US10540625B2	01- Jan- 2020	Himadri Sekhar Paul, Arijit Mukherjee, Arpan Pal and <b>Ansuman Banerjee (CCSD)</b>	International	United States

\* Name in bold denotes ISI faculty

## 6.2 Memorandum of Understanding -MoUs (2019-20)

The faculty of the Institute have always been interested in facilitating the development of collaborative programs in fields of mutual interests, both nationally and internationally, which serve to enhance partnerships for research and academic activities through appropriate memorandum of understanding (MoU).

### MoUs Signed by ISI during 2019-20

Sr. no.	University/Institution/Organization	National/ International	Country name if International	Effective from	Valid until
1	Ramakrishna Mission Vidyamandira	India		Apr-2019	Mar-2020
2	Tata Consultancy Services Ltd.	India		May-2019	Apr-2020
3	Airport Authority of India	India		May-2019	Apr-2020
4	Lal Bahadur Shastri National Academy of Administration, (LBSNAA), Mussoorie	India		Jun-2019	May-2020
5	Institute of Economic Growth	India		Jun-2019	May-2021
6	University of Reading, UK	International	UK	Jun-2019	May-2024
7	Defense Research and Development Organisation (DRDO)	India		Jun-2019	May-2021
8	Quality Council of India	India		Jul-2019	Jun-2020
9	National Technical Research Organisation (NTRO)	India		Aug-2019	Jul-2022
10	Larsen & Tubro Infotech Ltd.	India		Sep-2019	Aug-2021
11	Geological Survey of India, Ministry of Mines	India		Oct-2019	Sep-2022
12	Tata Steel Ltd.	India		Dec-2019	Nov-2020
13	University of Gothenburg, Sweden	International	Sweden	Jan-2020	Dec-2020
14	TCS Foundation	India		Jan-2020	Dec-2024
15	University of Groningen, Netherlands	International	Netherlands	Feb-2020	Jan-2025
16	Kidney Care Society	India		Feb-2020	Jan-2022

### MoUs Signed by ISI continuing during 2019-20

Sr. no.	University/Institution/Organization	National/ International	Country name, if International	Valid until
1	University of Amsterdam, Netherlands	International	Netherlands	May-2024
2	Springer (India) Pvt. Ltd.	India		Nov-2023
3	Universita Degli Studi Di Trieste, Italy	International	Italy	Nov-2023
4	MIT-Skills, Pune, India	India		Oct-2023
5	Basque Centre for Applied Mathematics (BCAM), Spain	International	Spain	May-2023
6	University of Auckland, New Zealand.	International	New Zealand	May-2023
7	AXISCADES Engineering Technologies Ltd.	India		Nov-2022
8	WISKey India Private Ltd.	India		Oct-2022
9	Tata Consultancy Services Ltd.	India		May-2022

Sr. no.	University/Institution/Organization	National/ International	Country name, if International	Valid until
10	University of Technology, Sydney	International	Australia	Mar-2022
11	CSIR National Metallurgical Laboratory, Government of India	India		Nov-2021
12	Dauphine Université Paris, France	International	France	Nov-2021
13	School of Electrical Engineering, Kyungpook National University, South Korea	International	South Korea	Nov-2021
14	Cognizant Technology Solutions India Pvt.Ltd.	India		Aug-2021
15	Ericsson India Pvt. Ltd.	India		May-2021
16	Tata Institute of Fundamental Research	India		May-2021
17	Institute for Financial Management and Research, Chennai	India		Apr-2021
18	Tata Consultancy Services Foundation	India		Apr-2021
19	Wipro Ltd.	India		Feb-2021
20	SyMec Project under Dept. of Biotech (NIBGM, ISSERK, TMC, BI, ISI, IICB)	India		Jan-2021
21	Dhirubhai Ambani, DA-IICT, Gandhinagar	India		Jan-2021
22	IIT, Madras	India		Nov-2020
23	Springer Nature Singapore Private Limited	International	Singapore	Jul-2020
24	Erasmus Programme/Technical University of Košice, Slovakia	International	Slovakia	Jun-2020
25	Hitachi India Pvt. Ltd.	India		Jun-2020
26	State University of New York, USA	International	USA	May-2020
27	National Research University - Higher School of Economics, Russia	International	Russia	May-2020
28	Quality Council of India	India		Apr-2020
29	The Curators of the University of Missouri-Kansas-city, USA	International	USA	Jan-2020
30	Pricewaterhouse Coopers Private Ltd.	India		Dec-2019
31	National Sample Survey Office, MOSPI	India		Dec-2019
32	Department of Biotechnology	India		Sep-2019
33	R S Software India Limited	India		Aug-2019
34	University of Campinas, Brazil	International	Brazil	Jul-2019
35	University of Gothenburg, Sweden	International	Sweden	Jul-2019
36	Erasmus Programme/University of the Aegean, Greece	International	Greece	Jul-2019



MOU signing with LBSNAA (03-06-2019)

## 6.3 MUSEUMS

### GEOLOGY MUSEUMS

<b>Name of In-charge (2019-20)</b>	Saswati Bandyopadhyay and Dhurjati Prasad Sengupta
<b>Physical Address</b>	Ground floor, Platinum Jubilee Building, ISI, Kolkata-700 108
<b>Founded in</b>	1962
<b>Founded by</b>	Pamela L. Robinson along with Sohan Lal Jain and Tapan Roy Chowdhury

### Brief Overview

The Museum of the Geological Studies Unit is a unique repository of terrestrial Mesozoic vertebrates. New, complete and partial skeletons of several vertebrate fossils including Jurassic and Cretaceous dinosaurs, dinosaur eggs, Triassic and only Permian reptile, and several Jurassic fishes are exhibited in this Museum apart from several holotype and paratype specimens kept in the repository.

### Major Collections

The Geology Museum has **36** new taxa of vertebrate fossils ranging from Permian (~255 My) to Cretaceous (65 My) period. Besides 14 more vertebrate taxa, whose details are awaited, are in the Repository. The main attraction of this Museum is the mounted skeleton of a Jurassic dinosaur, *Barapasaurus tagorei*. This mounted dinosaur was displayed ahead of the 4th International Gondwana Symposium in 1977 and was the only mounted dinosaur in India at that time.

A free-standing medium-sized rhynchosaur, *Hyperodon huxleyi* and a partial skeleton of a Cretaceous dinosaur *Isisaurus colberti* are the other mounted vertebrate fossils. Among the exhibits, *Endothiodon mahalnobisi* and five other mammal-like reptiles are the only known terrestrial reptiles of India. Besides an array of temnospondyl amphibians, dicynodonts and phytosaurs collected mostly from Pranhita - Godavari and Satpura basin are also on display.

In 2017, a discovery of the only known horned Triassic archosauromorph reptile, *Shringasaurus indicus*, from Madhya Pradesh, created a sensation in the world of palaeontology (<https://journalsdiary.com/2017/08/26/isi-kolkata-reptiles-horns/>).

These specimens are kept in the Museum at present with plans of mounting the same.



*Barapasaurus tagorei*, a Jurassic dinosaur



*Hyperodon huxleyi*, a medium-sized rhynchosaur



Jurassic fishes from Pranhita-Godavari basin



Dinosaur egg shells

## New initiatives in 2019-2020

- Previously the Geology Museum was famous for its non-marine vertebrates. New initiatives have been taken to preserve marine specimens, both invertebrates and vertebrates from western India like the Kutch, Saurashtra, Jaisalmer, Barmer areas.
- A programme for digitally cataloguing the specimens and creating an archive with relevant illustrations and photographs, both technical and general, has been initiated.
- Outreach programme: A programme on the deep time biodiversity of Bengal was conducted during Jan 27-28, 2020 by the Geological Studies Unit, ISI, Kolkata. The prime aim was to unite national and international experts working on deep time biodiversity of the flora and fauna of West- Bengal in order to create a data bank and awareness among people for proper conservation of the fossil heritage of West Bengal. Professor Nigel Hughes, a visiting Fulbright fellow from University of California, Riverside, USA and Professor Ashok Sahni, Emeritus Professor, Punjab University participated in the programme amongst many others.
- A MOU was signed in Oct, 2019 between ISI and the Geological Survey of India on the fossils of the Panchet Formation, mostly from West Bengal.

## Visitors

Many international and national experts as well as students of vertebrate palaeontology visit the Museum regularly to study the rare collections. The names of some paleontologists who collaborated with the faculty of the Geological Studies Unit, ISI and visited the Geology Museum during 2019-2020 are

- Mr. Tariq Abdul Kareem, Research Scholar, LSA Museum of Paleontology, University of Michigan (Jul 01 – 16, 2019).
- Prof. Walter Joyce, Université de Fribourg, Department of Geosciences, Switzerland (Sep 12 – 19, 2019).
- Dr. Sergio Da Silva, Santa Maria University, Brasil (Nov 02 – 17, 2019).
- Prof. Nigel Hughes, Fulbright Fellow, University of California, Riverside (Nov, 2019 – Mar, 2020).

Besides the scientific community, several dignitaries also come to visit the museum. Some who visited during 2019-2020



Indo-French Workshop (SAIDS 2020) 13-01-2020



On World Womens day 06-03-2020



Prof. Joachim Frank and other dignitaries visiting the Museum after Convocation 23-01-2020



Prof. Joachim Frank, Chief Guest of 54th Convocation visiting the Museum

## PRASANTA CHANDRA MAHALANOBIS MEMORIAL MUSEUM & ARCHIVES

<b>Name of In-charge (2019-20)</b>	Dr. Kishor Chandra Satpathy
<b>Physical Address</b>	Amrapali, ISI, 204 B T Road, Kolkata-700 108
<b>Founded in</b>	29th June , 1993
<b>Founded by</b>	Indian Statistical Institute

The Prasanta Chandra Mahalanobis Memorial Museum & Archives (PCMMM&A) was established in 1993 on the occasion of the birth centenary celebration of Professor Prasanta Chandra Mahalanobis (PCM), a pioneering statistician and the founder of the Indian Statistical Institute. Its major objective is the collection, preservation, restoration, display, communication and documentation of personalia, memorabilia as well as rare source materials connected with the life and legacy of Mahalanobis, which also encompass the historical growth of the Institute and of statistical science in India.

### The Museum

It is housed in Amrapali, the erstwhile residence of Mahalanobis, located on the campus of the Institute at Kolkata. The ground floor, on the eastern side has a permanent exhibition on his life and work through photographic displays, spread over five galleries. There are 921 exhibits through 101 panels and a collection of artifacts related to PCM on display in these galleries. An open lounge called the Chatal, his study room and personal areas of residence, have been preserved for viewing on the first floor. In 2016, a new gallery (Gallery-VI) on the special relationship of Prasanta Chandra Mahalanobis and his wife, Nirmal Kumari Mahalanobis, with Rabindranath Tagore was inaugurated on the 1st floor.



Chatal



Gallery VI

### Archives

The archival materials trace the history of the development of statistics in the Indian sub-continent during his lifetime and beyond, with special reference to his outstanding contributions in this area. They include official and personal documents, files, correspondence, scientific and literary papers, photographs, newspaper cuttings, diaries, and manuscripts related to Mahalanobis and Nirmal Kumari. Audio-visual materials like sound recordings and film footage, negatives and slides, also form a part of this collection. There are roughly 3 lakh documents, of which around 1.9 lakh have been treated. Digitization of the documents commenced in 2007. Till date around 25,000 documents have been digitized and metadata of approximately 20,000 documents have been saved on a customized server, while around 2000 documents have been uploaded to the D-space server.



## PCM Museum and Archives Collections

Name of Collection	Brief Overview of Collection
<b>Files (Documents)</b>	3,00,000 documents
<b>Books</b>	550 approx
<b>Audio-video[Spool, Record, Cassettes]</b>	93 nos, 89 nos, 101 nos
<b>Photographs</b>	4000 approx
<b>Negatives</b>	5000 approx
<b>Slides</b>	1236 slides approx
<b>Artefacts</b>	1330 approx

## Major Activities

- **Conservation and Documentation** for preservation of the collection to ensure availability to present and future researchers.
- **Reference Services** for researchers and scholars desiring to avail the archival collection for reference purposes
- **Guided tours** for visitors
- **Participation in events and organization of activities related to PCM and the History of Statistics**

## Activities during 2019-20:

- Curated an exhibition on PCM's Life and Work in a book fair at the Biswa Bangla Convention Centre as part of India International Science Festival, 2019 during November 5-8, 2019
- Assisted MoSPI in organizing an exhibition during November 18-20, 2019 on the History of Statistics and Evolution of Agriculture Statistics, by providing documents from its collection.

## Visitors:

Besides general visitors, eminent persons, scientists and students from schools, colleges, Universities visited the museum (total no. 650 approx.).

Some eminent visitors are like:

- Joachim Frank, Nobel Laureate (23.01.2019)
- Parameswaran Sreekumar, Director, Space Science Programme Office, ISRO (11.11.2019)
- Spencer Pixton, Proquest, USA (19.09.2019)
- Oscar Blasco, Universided de Valencia, Spain (12.12.2019).



Visit of Joachim Frank, Nobel laureate, 23. 01. 2020



Visit of Oscar Blasco, Universided de Valencia, Spain



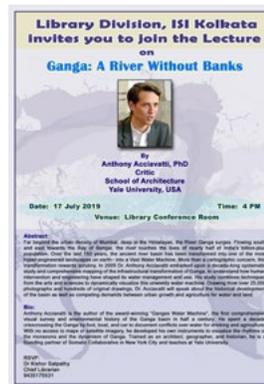
Dignitaries of Indo French workshop on Statistics and Artificial Intelligence for Data Science visits PCMMM&A, 13.01.2020



Seniors Officers of LBSNAA vists PCMMM&A, 03.06.2019



Visit of Spencer Pixton, 19.09.2019



## 6.3 Scientific Assignments

Scientific assignments, both national and international, serve to stimulate exchange of information relating to activities in teaching and research and promote appropriate joint research collaborative projects. Those undertaken by the faculty of the Institute, during 2019-2020, are listed below-

### A. K. DAS, SQC&OR Unit Kolkata

Keynote speaker on the occasion of Ramanujan Day, National Conference on Mathematical Science and Applications at IIITDM, Jabalpur (Dec 22-23, 2019)

Lecture on Operations Research, TCS, Kolkata (Nov 18-19, 2019)

### ABHAY GOPAL BHATT, Stat-Math Unit Delhi

Teaching a Course, Ashoka University (Sep 02, 05, 09, 12, 16, 19 and 23, 2019)

Lectures in Summer School on Mathematical Finance-CMI, Chennai (May 29-31, 2019)

### ABHIK GHOSH, ISRU Kolkata

Invited talk, 5th International Conference on Statistics for Twenty First Century (ICSTC 2019), University of Kerala, Trivandrum, (Dec 16- 20, 2019)

To receive the NASI-Young Scientist Platinum Jubilee Award 2019, NASI 89th Annual Session & Symposium on Science and Technology based Entrepreneurship Development in joint collaboration with the National Academy of Agricultural Research Management (NAARM), Hyderabad (Dec 21- 23, 2019)

Invited talk, 4th Russian-Indian Joint Conference in Statistics and Probability, Euler Mathematical Institute, St. Petersburg, Russia (Jun 10- 14, 2019)

Oral Presentation, 62nd ISI World Statistics Congress, Kuala Lumpur, Malaysia (Aug 18 - 23, 2019)

Collaborative research with Prof. Magne Thoresen, University of Oslo, Norway (Jan 01 - Jan 17, 2020)

### ABHIROOP MUKHOPADHYAY, EPU Delhi

Workshop on Industrial Organisation, IGC -IDSK Summer School (Aug 01, 2019)

Chair, Panel on Education-International Growth Centre Conference on Gender (Dec 06-07, 2019)

Panelist, The Indian Econometric Society Conference (Jan 08-09, 2020)

Panelist, Indian Democracy at Work Conference (Jan 10, 2020)

Academic Collaboration, Waseda University, Japan (Jun 01-06, 2019)

Conference, IUSSP Conference on Poverty and Inequality, University of Michigan, USA (Jun 25 - 30, 2019)

Academic Collaboration, University of Connecticut, USA (July 01-04, 2019)

Academic Collaboration, Deakin University, Australia (Aug 02 - 21, 2019)

Oral Presentation, EfD Conference, Colombia (Nov 22- 25, 2019)

Academic Visit and Seminar, Universidad Los andes, Colombia (Nov 26- 30, 2019)

### AMITA PAL, ISRU Kolkata

Oral Presentation, 8th International Conference on Software and Computing Technologies (ICSCT 2019), Hong Kong (Apr 05 - 07, 2019)

Academic visit and two invited lectures, Joint Program of Survey Methodology, University of Maryland, College Park, USA (Apr 27 - May 06, 2019)

### ANISH SARKAR, Stat-Math Unit Delhi

Workshop on Probability & Stochastic Processes, Indian Academy of Sciences, Bangalore (Feb 22- 27, 2020)

Teaching a Course, Plaksha University (Aug 10-11, 17-18, 24-25, 31 and Sep 01, 2019)

Workshop, Institute for Mathematical Sciences, National University of Singapore (May 27-30, 2019)

### ANISUR RAHAMAN MOLLA, CSRU Kolkata

INSPIRE Faculty Fellows Review Meeting, DST, Govt. of India (Oct 21-23, 2019)

Invited Tutorial speaker and oral presentation, 21st International Conference on Distributed Computing and Networking (ICDCN 2020), Kolkata (Jan 04-07, 2020)

Workshop on Secure Multiparty Computation: Theory and Practice-Indian Institute of Science, Bangalore (Jan 19-21, 2020)

Oral presentation, 15th Annual Conference on Theory and Applications of Models of Computation (TAMC 2019), Kitakyushu, Japan (Apr 13- 16, 2019)

### ANSUMAN BANERJEE, ACMU Kolkata

Research Collaboration visit, Ericsson Research Bangalore (Jun 02-Aug 30, 2019)

Oral Presentation, International Conference on Service Oriented Computing (ICSOC), Toulouse, France (Oct 28- 31, 2019)

Paper presentation-IEEE Conference on Service Oriented Computing and Applications (SOCA), Kaohsiung, Taiwan (Nov 18-21, 2019)

### ANTAR BANDOPADHYAY, Stat-Math Unit Delhi

Mini Course on Markov Chains, Advanced Instructional School on Stochastic Processes Level I & II, -NISER, Bhubaneswar (Jul 01-06, 2019)

Invited talk, Department of Mathematics, Indian Institute of Technology, Kanpur (Aug 01, 2019)

Workshop on Probability & Stochastic Processes, Indian Academy of Sciences, Bangalore (Feb 23-27, 2020)

Research work at INDSTATS 2019 (IISA), IIT Mumbai (Dec 27, 2019)

4th Russian-Indian Joint Conference in Statistics and Probability, The Euler International Mathematical Institute, Saint Petersburg, Russia (Jun 10-14, 2019)

Academic Visit, Uppsala University, Sweden (Aug 12-31, 2019)

Invited talk, Probability Colloquium, Uppsala University, Sweden (Aug 22, 2019)

Invited talk, Chalmers University of Gothenburg, Gothenburg, Sweden (Aug 27, 2019)

### ARIJIT GHOSH, ACMU Kolkata

Research Collaboration, INRIA Sophia Antipolis (Aug 28- Sep 19, 2019)

### ARINDAM CHATTERJEE, Stat-Math Unit Delhi

Collaborative Research, IIM, Ahmedabad (Dec 30- Jan 07, 2020)

Collaborative Research, IIT Kanpur (Nov 25- 26, 2019)

**ARUNAVA SEN, EPU, Delhi**

Academic Visit, Maastricht University, The Netherlands (Jan 28-Feb 02, 2020)

**ARUP BOSE, Stat-Math Unit Kolkata**

Teaching Short course (4.5 hours), Enhancement of Teaching and Learning Skills in Statistics, Central University of Rajasthan (Mar 12-16, 2019)

Organizer (with Krishanu Maulik and Rajat Hazra), Two Random Days (Nov 13-14, 2019)

Visit and research collaboration, Indian Institute of Technology, Mumbai (Jan 21-28, 2020)

Delivered two lectures and research collaboration, University of Hyderabad (Mar 11-15, 2020)

Research collaboration, Department of Statistics, University of Minnesota, USA (Jul 17- 27, 2019)

Contributed Talk, Joint Statistical Meeting, Denver, USA (Jul 27-Aug 01, 2019)

Research collaboration, Department of Economics, University of Cincinnati, Ohio, USA (Jul 31-Aug 07, 2019)

Research collaboration, Shanghai University of Finance and Economics (Dec 05- 06, 2019)

Visit and lecture, Northeast Normal University, Changchun, China; Visit and lecture on Joint Convergence of Sample Autocovariance Matrices and Application (Dec 07- 09, 2019)

Invited talk, Shanghai University of Finance and Economics, China; Invited talk at Random Matrices and Complex Data Analysis Workshop (Dec 10-12, 2019)

**ARUP KUMAR PAL, Stat-Math Unit Delhi**

Minicourse in National Center for Mathematics Workshop on Operator algebras, quantum groups and noncommutative geometry, IISER Bhopal (Jul 04-13, 2019)

Minicourse in Advanced Instructional School on Operator Theory, IIT Kanpur (Dec 20-24, 2019)

**ASHISH GHOSH, MIU Kolkata**

Honorary General Chair, International Conference on Intelligent Computing and Remote Sensing (ICICRS 2019), Bhubaneswar, Odisha (Jul 19-20, 2019)

Program Chair, Recent Advances in Geoscience and Remote Sensing: Technologies, Standards and Applications (TENGARSS-2019), Kochi, Kerala (Oct 18-20, 2019)

Plenary Chair, Eighth International Conference on Pattern Recognition and Machine Intelligence (PREMI'19), Tezpur University, Assam (Dec 17-20, 2019)

Honorary Chair, Biologically Inspired Techniques in Many-Criteria Decision Making (BITMDM-2019), Balassore, Odisha (Dec 19-20, 2019)

Leadership for Academicians Programme (LEAP) of Ministry of Human Resource Development (MHRD, Govt. of India), IIT Kharagpur (May 13-24, 2019)

Keynote Speaker, BITMDM-2019: International Conference on Biologically Inspired Techniques in Many-Criteria Decision Making, Fakir Mohan University, Balasore (Dec 19, 2019)

Invited talk, IEEE GRSS (Kolkata Chapter) CHAPNET-2019: International Workshop on Advanced Machine Learning Techniques for Climate Informatics, Indian Statistical Institute, Kolkata (Nov 05, 2019)

Plenary talk, International Conference on Intelligent Computing and Remote Sensing (ICICRS 2019), Bhubaneswar, Odisha (Jul 19, 2019)

Special Invited talk, SRM University, Chennai, (Jun 15, 2019)

Special lecture- Indian Institute of Information Technology Design and Manufacturing, Kanchipuram, (Feb 23, 2019)

Special Invited talk-6th International Conference Dedicated to Advanced Data Analysis, Business Analytics and Business

Intelligence (ICADABAI-2019), Indian Institute of Management Ahmedabad, (Apr 06-07, 2019)

Keynote talk, International Conference on Artificial Intelligence and Machine Learning (IAIM 2019), Sathyabama Institute of Science and Technology, Chennai (Apr 03-05, 2019)

Keynote talk, International Conference on Computational Intelligence in Data Science, SSN College of Engineering, Chennai (Feb 21-23, 2019)

Invited talk, Vellore Institute of Technology, Vellore (Feb 21-, 2019)

Leadership for Academicians Programme (LEAP), Ministry of Human Resource Development (MHRD, Govt. of India), Cambridge University, UK (Jun 03- 08, 2019)

**ASHIS KR. PAL,**

"Eastern Regional Training Programme on Plagiarism Detection Software, PDS (URKUND)" organized by IIM Calcutta (Aug 21, 19).

**ASHOK SARKAR, SQC&OR Unit Mumbai**

Guest Speaker and Panelist, 2nd Organizational Excellence & Lean Six Sigma Conference (OELSS), Six Sigma Management Institute, Colombo, Sri Lanka (Oct 30, 2019)

**AYANENDRANATH BASU, ISRU Kolkata**

Plenary Lecture, Prof. C. R. Rao Birth Century Celebrations, C R Rao Advanced Institute of Mathematics, Statistics and Computer Science, Hyderabad (Sep 11, 2019)

Invited Lecture, National Seminar on Applications of Statistics in Natural Sciences, St. Xavier's College, Kolkata (Dec 16, 2019)

Collaborative research with Prof. Leandro Pardo, Universidad Complutense de Madrid, Spain (Apr 24 - 30, 2019)

Invited lecture, 62nd World Statistics Congress, Kuala Lumpur, Malaysia (Aug 18 - 23, 2019)

Collaborative research with Prof. Leandro Pardo and invited talk, Symposium on Information Theory with Applications to Statistical Inference, Universidad Complutense de Madrid, Spain, (Nov 30 - Dec 05, 2019)

**AYINEEDI VENKATESWARLU, CSU Chennai**

Delivered a talk, Dept. Of Mathematics, IIT Madras (Aug 28, 2019)

Paper presentation, INDOCRYPT 2019 (Dec 15-18, 2019)

**B. RAJEEV, Stat-Math Unit Bengaluru**

Gave 5 lectures on 'Measure Theoretic Probability', Workshop on Probability Theory, Central University, Kannur (Feb 11-17, 2019)

Collaborative research with Prof. Thorsten Schmidt, Freiburg Institute for Advanced Studies, University of Freiburg, Germany (Jun 11-18, 2019)

Visited and delivered talks, Bergische Universität Wuppertal, Germany (Jun 23- 28, 2019)

Scientific collaboration and talk, International laboratory of stochastic algorithms and high-dimensional inference (HDI Lab), National Research University Higher School of Economics, Moscow (Sep 09-13, 2019)

**B. SURY, Stat-Math Unit Bengaluru**

Leader of team that represented India in the 'Romanian Master of Mathematics 2020-Romania, Bucharest (Feb 24-Mar 03, 2020)

**B. S. DAYA SAGAR, SSIU Bengaluru**

Keynote Talk, Osmania University, Hyderabad (Dec 27, 2019)

Member, Doctoral Thesis Examination Committee, Multimedia University, Malaysia (Oct 17, 2019)

ITPAR-Phase-IV Visit (as part of the Project-ITPAR-Phase-IV), Trento, Italy (Nov 30- Dec 08, 2019)

**B. V. RAJARAMA BHAT, Stat-Math Unit Bengaluru**

Invited lecture series on Quantum Probability, Ritsumeikan University, Japan (Oct 21- Nov 02, 2019)

Invited talk, Research Institute of Mathematical Sciences (RIMS), Kyoto, Japan (Nov 02, 2019)

**BANASRI BASU, PAMU Kolkata**

Invited talk, Geometric Phases in Optics and Topological Matter-International Centre for Theoretical Sciences, Bangalore (Jan 21-24, 2020)

**BARUN MUKHOPADHYAY, BAU Kolkata**

Oral Presentation, 11th International Association of Gerontology and Geriatrics Asia/ Oceania Regional Congress, Taipei, Taiwan (Oct 23 - 27, 2019)

**BHABATOSH CHANDA, ECSU Kolkata**

M Tech thesis evaluation, IIT, Kharagpur (Apr 24, 2019)

Faculty selection, IIT, Jodhpur (Jun 15, 2019 and Mar 28, 2020)

Doctoral committee meeting, IEST, Shibpur (Jul 07, and Nov 29, 2019)

Panel Discussion, Tata Medical Center, Kolkata (Jul 26, 2019)

Lectures in Short Term Course on Recent Trends in Machine Learning for Computer Vision and Image Analysis, NIT, Durgapur (Aug 21, 2019)

Academic audit of ECE Department, VNIT, Nagpur (Aug 23-24, 2019)

Developing course syllabus for Digital Humanities, IIT, Jodhpur (Sep 27-29, 2019)

Delivering lecture Short Term Course, Machine Learning for Biomedical Image Analysis, NIT, Durgapur (Nov 01-15, 2019)

Lecture at Intl. Conf. Industry Interactive Innovation in Science, Engineering and Technology, JISCE, Kalyani (Dec 13-14, 2019)

Lecture in Seminar, Bureau of Indian Standards (Nov 20, 2019)

Workshop, Computer Vision and Multimedia Computing (CVMC), Jadavpur University, Kolkata (Feb 10, 2020)

**BISWAJIT GHOSH**

National Workshop on Koha (An open Source Solutions for Making Effective Library) at Bharatiya Vidya Bhaban Institute of Management Science, Kolkata (July 27-28, 2019).

**BISWANATH DUTTA, DRTC Bengaluru**

Key note speaker, 2nd International Conference on Digital Transformation: A Cognitive learning towards Artificial Intelligence, Rajiv Gandhi National University of Law, Punjab, Patiala (Sep 06-08, 2019)

Scientific collaboration for DataScientia project, University of Trento (Nov 30- Dec 07, 2019)

**BOBY JOHN, SQC&OR Unit Bengaluru**

Invited lecture, Pre-Conference Workshop on Machine Learning using Python, Loyola-ICAM College of Engineering and Technology, Chennai (Jan 20, 2020)

Invited lecture, National Workshop on Data Science using Python, Bharathiyar University, Coimbatore (Mar 06, 2020)

**CHETAN GHATE, EPU Delhi**

Invitation, Reserve Bank of India (RBI), Mumbai (Apr 29-May 04, 2019)

Invited Lectures, Summer School in Macroeconomics at Presidency University, Kolkata (Jul 29-Aug 02, 2019)

Invited Lectures, Workshop on DSGE Models at Jadavpur University (Sep 01-30, 2019)

Seminar, 21st Neemrana-NBER Conference, Neemrana (Dec 01-31, 2019)

Keynote Lecture, 40th Annual Conference of the Rajasthan Economic Association, Vijay Shankar Vyas Memorial, Jaipur (Jan 01-31, 2020)

Seminar-IMF Conference on Fostering Growth in South Asia, New Delhi (Feb 01-29, 2020)

Academic Visit, Korea University (Apr 01-30, 2019)

Seminar, Western Economic Association Meetings, San Francisco and IMF, Washington DC (Jun 01-30, 2019)

Academic Visit, Osaka University (Dec 01-31, 2019)

Seminar, NYU, Abu Dhabi (Feb 01- 29, 2020)

**D. DUTTA ROY, PRU Kolkata**

Invited lecture, National Institute of Education (NIE), Colombo, Sri Lanka (Feb 11- 12, 2020)

**D. K. MANNA, SQC&OR Unit Kolkata**

Teaching a course "Stochastic Processes"-Big Data Analytics (M.Sc.: 2019-21) Programme/ Ramakrishna Mission Vivekananda Educational and Research Institute, Howrah, West Bengal (Nov 01-30, 2019)

**DARPA SAURAV JYETHI, TASU Tezpur**

Co- Chair of a session and oral presentation, 26th International Symposium on Polycyclic Aromatic Compounds (ISPAC 2019), Örebro University, Örebro, Sweden (Sep 09-12, 2019)

**DEBASIS MISHRA, EPU Delhi**

Organizer, Delhi Economic Theory Workshop (Apr -Aug 2019, Oct- Nov 2019)

**DEBRUP CHAKRABORTY, CSRU Kolkata**

Invited Speaker, Doctoral Symposium, NIIT University, Neemrana (Apr 06-09, 2019)

Tutorial Speaker, SPACE 2019 (Dec 03-07, 2019)

**DEEPAYAN SARKAR, Stat-Math Unit Delhi**

Conference BioC 2019, New York (Jun 24-28, 2019)

Academic Workshop, University of Zurich, Switzerland (Aug 21-23, 2019)

**DEVIKA P MADALLI, DRTC Bengaluru**

Course Coordinator for evaluation of answer scripts for the SWAYAM examination -National Testing Agency (NTA) Office, Noida, Uttar Pradesh (Jun 04-07, 2019)

Attended meeting as Supervisor, PhD Research Advisory Committee, Library & Information Science, University of Calcutta, (Jun 10-11, 2019)

PhD meeting, BIT Mesra (Oct 09-10, 2019)

Attended IASLIC seminar, CUSAT University (Dec 02-06, 2019)

Attended Seminar, UPES, Dehradun (Dec 19-20, 2019)

Attended Conference, NIT Karnataka (Dec 26-27, 2019)

To give Lecture, CSIR-CFTRI (Feb 03-04, 2020)

Attended Workshop, Saint Clare College, Ziro, Arunachal Pradesh (Feb 24-28, 2020)

Special lectures, Research Data Alliance Plenary 13, Drexel University, Philadelphia (Apr 01- 14, 2019)

Participation in High level international Meeting on Research Infrastructures, CODATA 2019, Beijing, China (Sep 14- 24, 2019)

To attend RDA Plenary IV-Aalto University, Helsinki, Finland (Oct 17- 27, 2019)

**DHURJATI PRASAD SENGUPTA, GSU Kolkata**

Participation in symposium, North American Paleontological Convention (NAPC), as a part of their 11th convention at University of California, Riverside, California, USA (Jun 23- 27, 2019)

**DIPTI PRASAD MUKHERJEE, ECSU Kolkata**

Seminar on Random Forest-Workshop on Explainable Artificial Intelligence and Machine Learning for Multimedia Data, IIT Jammu, Jammu (Dec 06-07, 2019)  
 Seminar on Machine Learning-CSI Regional Student Convention at MCKV Engineering College, Howrah (Nov 13, 2019)  
 Seminar on Application of Machine Learning in Image Processing-Vignans's Institute of Information Technology, Vishakhapatnam (Aug 30, 2019)  
 Oral presentation, IEEE International Conference on Image Processing-ICIP 2019 (Sep 22- 25, 2019)  
 Invited talk, National Yang Ming University, Taipei (September 26, 2019)  
 Invited talk, Chia Tung University, Hsin-Chu, Taiwan (September 27, 2019)  
 Research collaboration and lectures in Multimedia Program, Department of Computing Science, University of Alberta, Edmonton (Feb 01- 29, 2019)

**E. SOMANATHAN, EPU Delhi**

Organizer, 5th Annual CECFEE Research & Policy Workshop, Tezpur, Assam (Nov 10-11, 2019)  
 Research Visit, Peking University Environmental Economics Workshop, Beijing, China (Apr 06- 07, 2019)  
 Lecture, Summer School of International Organizational Economics Association, Corsica, France (May 20-24, 2019)  
 Research Visit, SANDEE Steering Committee meeting at Kathmandu, Nepal (Jun 12-13, 2019)  
 Board Meeting, Environment for Development Initiatives EfD Board Meeting Wyoming, USA (Aug 19- 22, 2019)  
 Annual meeting, 13thEfD Annual meeting, Bogota, Columbia (Nov 21- 25, 2019)  
 Invited speaker, RIDGE Environmental Economics workshop in Montevideo, Uruguay (Nov 28, 2019)

**FARZANA AFRIDI, EPU Delhi**

Workshop, Community Networks and Institutions, Ashoka University (Apr 12, 2019)  
 Invited for Talk/Panel, IWWAGE-IFMR, IGC, Delhi (May 17, 2019)  
 Invited for Talk/Panel, St. Stephen's College, Delhi (Aug 16, 2019)  
 Panel, IGC India Conference (Sep 10, 2019)  
 Invited for Talk/Panel, 3ie, Delhi Evidence Week (Nov 06-07, 2019)  
 Conference, Delhi School of Economics (Nov 14, 2019)  
 Invited for Talk/Panel, IGC, Bihar, Patna, (Dec 06-08, 2019)  
 Conference, Network Economics, IIM Ahmedabad (Dec 08, 2019)  
 Conference, Sustainable Development Conference, Prato, Italy, Monash University (Jun 26-27, 2019)  
 Conference, IUSSP Conference, Ann Arbor, Michigan (June 27-29, 2019)  
 Invited for Talk/Panel, United Nations General Assembly, UN-Women-ILO, New York (Oct 17, 2019)

**G. RAVINDRAN, SQC&OR Unit Chennai**

Invited Speaker, National Workshop on Special Matrices & Stochastic Games. Title: Algorithms for solving Stochastic Games, Sikkim Manipal University, Sikkim (Jan 06-15, 2020)

**GOUTAM K. PAUL, CSRU Kolkata**

Invited Speaker, International symposium on Quantum Information Technology-DIAT, Pune (Dec 05, 2019)  
 Invited Speaker, TIFR, School of Technology and Computer Science (Dec 31, 2019)

**GURUPRASAD KAR, PAMU Kolkata**

Workshop on Quantum Information and Applications, Centre for Development of Advanced Computing (CDAC), Kolkata (Sep 12-13, 2020)  
 Academic Programme on Quantum Computational Intelligence, RCCIIT, Kolkata (Nov 02-14, 2019)  
 Invited speaker, National Conference, Quantum Information and Computations (QIC) 2019, IIT Jodhpur (Dec 09-11, 2019)

**INDRANIL MUKHOPADHYAY, HGU Kolkata**

Guest Speaker, Novartis Hyderabad Conference of Statistics in the Pharmaceutical Industry (Jul 02-04, 2019)  
 Faculty recruitment for the Department of Mathematics, VIT, AP University (Nov 23-25, 2019)  
 Workshop, Invited Talk, National University of Singapore (Aug 05 - 16, 2019)  
 Collaborative Research, UMR MIA-Paris (AgroParisTech /INRA) (Sep 29 - Oct 29, 2019)  
 Collaborative Research, Invited Talk-Glasgow University, UK (Oct 30 - Nov 04, 2019)

**ISHA DEWAN, Stat-Math Unit Delhi**

Workshop, Pondicherry University, (Dec 10-13, 2019)  
 Attended 11th International Conference on Mathematical Methods in Reliability, City University of Hong Kong (Jun 03-06, 2019)

**JAYDEB SARKAR, Stat-Math Unit Bengaluru**

Participated and gave a talk, Annual Conference, Ramanujan Mathematical Society, Pondicherry (Aug 01-03, 2019)  
 Participated and gave a talk, Mathematics Research Scholars Meet 2019, Jammu University (Aug 20-22, 2019)  
 Organizer, Conference on functional analysis, IIT Bombay (Oct 12-15, 2019)  
 Participated and gave a talk-NCAMAA, PGDAV College, University of Delhi (Nov 08-10, 2019)  
 Participated and gave a talk, International Conference on Analysis and its Applications, Jammu University (Dec 16-18, 2019)  
 Participated and gave a talk, International Conference on Algebra, Analysis and Applications, MLSU Jaipur (Dec 20-22, 2019)  
 Organizer, Conference on Noncommutative Geometry and its Applications, NISER (Jan 06-10, 2020)  
 Invited Speaker, ICAACA 2020, Jadavpur University (Jan 20-22, 2020)  
 Participated and gave a talk, Recent Advances in Mathematics and its Applications, University of Calcutta (Feb 06- 07, 2020)  
 Participated and gave a talk, National Seminar, Vidyasagar Metropolitan College (Feb 07-08, 2020)  
 Participated-ICMSA 2020, University of Kalyani (Feb 26-28, 2020)  
 Participated-Math Symposium, IISER Bhopal (Mar 06-07, 2020)  
 Research visit, Institute of Mathematics of the Romanian Academy, Romania (May 14- 29, 2019)  
 Research visit, Mohammed V University (Jun 22- 27, 2019)  
 Oral presentation, First International Workshop on Interaction between operator theory and linear dynamical systems, El Jadida, Morocco (Jun 27- 29, 2019)  
 Oral presentation, NWU Mathematics Workshop 2019, North-West University, South Africa (Sep 25- 27, 2019)  
 TSIMF, China-Hilbert Modules in Analytic Function Spaces (Dec 30-Jan 03, 2020)

**JIBAN K. PAL**

ALCTS Online Course on Fundamentals of Collection Development and Management (FCDM), from 28 October to 22 November 2019 (Fall 2019 Session); conducted by the Association for Library Collections & Technical Services (ALCTS), a division of the American Library Association (ALA).

“Eastern Regional Training Programme on Plagiarism Detection Software, PDS (URKUND)” organized by IIM Calcutta (Aug 21, 19).

Invited lecture in the Workshop on Citation Index: An Important Tool for Academic and Research Professionals, ICAR-National Institute of Natural Fibre Engineering and Technology (NINFET), Kolkata (February 18, 2020)

Invited lectures in the Workshop on Library Discovery Systems (LDS), SRFTI, Kolkata (December 29, 2019).

#### **KALPANA T.M**

Symposium titled “Data Representation and Organization Techniques” jointly organized by the DRTC, ISI Bangalore and the Metadata Research Centre, DREXEL UNIVERSITY (July 2-4, 2019).  
Lecture on “Plagiarism, with special reference to URKUND” In National Level Workshop on Writing Research papers and publishing, plagiarism and Digital content for Research, MEASI Chennai (Feb 29, 2020).

#### **KANISHKA KACKER, EPU Delhi**

Conference, 94th Annual Western Economic Association International Conference, San Francisco, US (Jun 01-30, 2019)

Research visit, 13th Annual Meeting of the Environment for Development Initiative, Bogota, Colombia (Nov 01-30, 2019)

Research visit, External Evaluation and Funding Proposal for the Environment for Development Initiative, Gothenburg, Sweden (Jan 01-31, 2020)

#### **KISHOR CHANDRA SATPATHY**

Workshop on “Wikidata and the scholarly publishing ecosystem” & “Exploring the Metadata 2020 outputs”, FORCE 11, Scotland, UK (Oct. 15, 2019).

National Workshop on “Adoption of Rights Statements for Digital Libraries in India” NDLI- IIT Kharagpur (Sept 7-9, 2019).

“Eastern Regional Training Programme on Plagiarism Detection Software, PDS (URKUND)”, IIM Calcutta (Aug 21, 2019)

South Asia eBook Forum 2019 on “Evidence & Impact: Transforming Research through Analytics and Insights”, Guwahati (May 21-23, 2019)

3rd South Asian Librarian Advisory Board Meeting of Cambridge University Press, New Delhi (Nov 18-19, 2019)

Organised One day workshop titled “Copyright and Licensing Modalities in the Digital Era: Trends, Practices & Prospects” (February 13, 2020)

Invited Lecture on “Library Marketing and Popularize Library Services among Communities” at SLSTINET annual conference, Colombo, Sri Lanka (Aug. 9, 2019).

Invited Lecture on “Plagiarism-Ethics and Legality” at Workshop on “Professional Ethics of Publications”, Asiatic Society (June 25, 2019).

Invited Lecture & Keynote Speaker in National Workshop on Koha (An open Source Solutions for Making Effective Library) at Bharatiya Vidya Bhaban Institute of Management Science, Kolkata (July 27-28, 2019).

Resource Person in the refresher course on “Librarianship in the New Paradigm”, Jadavpur University, Kolkata ( Aug. 9, 2019).

Invited Lecture in the “National Conference on Innovative Librarianship: A Foresight on Technology, Practice & Services” at CUTN, Tamil Nadu held on 1st–2nd Aug. 2019 and was guest of honor in the Valedictory Session

Special Panel Member in “ProQuest Day”, New Delhi (Sept. 21, 2019).

Resource Person in the Workshop on “Branding your LRC through Innovative Library Space and Services” at Vignana Jyothi Institute of Management, Hyderabad (Nov. 6, 2019).

Invited Lecture in the National Seminar entitled “Special Needs

Towards Inclusive Library Services in India” organized by NILD, Kolkata (Nov. 16-17, 2019).

Invited Lecture on ‘Transition and Sustainable Innovative Spaces’ in the Seminar on “Sustainable Library” organized by Department of Library and Information Science, Jadavpur University, Kolkata (Jan. 25, 2020).

#### **KRISHNENDU MUKHOPADHYAYA, ACMU Kolkata**

Invited talk and research discussion, Sanya, China (Apr 27- May 03, 2019)

Paper presentation, L’Aquila, Italy (Jun 28- Jul 05, 2019)

#### **KUNTAL GHOSH, MIU Kolkata**

Invited Session Chair and member, Jury Board, C A Murthy Memorial Doctoral Symposium, 8th International Conference on Pattern Recognition and Machine Intelligence (PReMI 2019), Tezpur University, Assam (Dec 17 -20, 2019)

Invited speaker, Winter School on Mathematics for the Post Graduate Students of North-eastern States, NE Center, Tezpur, Assam (Jan 28-Feb 01, 2020)

Organizing Chair, 4th International Conference on Computational Intelligence and Networks (CINE 2020), ISI, Kolkata (Feb 27-29, 2020)

#### **MANEESH THAKUR, Stat-Math Unit Bengaluru**

Research Visit and Oral presentation, Mathematical Institute Münster, Germany (May 23-Jul 19, 2019)

#### **MANIPUSHPAK MITRA, ERU Kolkata**

Collaborative research work, Department of Economics, Seoul National University, South Korea (Sep 17- 27, 2019)

#### **MATHEW C. FRANCIS, CSU Chennai**

Collaborative research, Indian Institute of Science, Bangalore (Apr 21-26, 2019)

Delivered a talk, Workshop at Institute of Mathematical Sciences (Nov 29, 2019)

#### **MATHEW JOSEPH, Stat-Math Unit Bengaluru**

Spring Probability Workshop, Institute of Mathematics in Academia Sinica, Taipei, Taiwan (May 20-22, 2019)

Singapore-Abu Dhabi-Shanghai-India Probability Meeting (SASI), Institute for Mathematical Sciences (IMS), National University of Singapore (May 27- 29, 2019)

Attended research program, Small ball probability estimates for SPDEs”, Centre International de Rencontres Mathematiques, France (Jul 8-19, 2019)

Research collaboration and talk, Probability Seminar in the Department of Mathematics, Pohang University of Science and Technology, Republic of Korea (Sep 4- 11, 2019)

#### **Mitra Paladhi, Monali**

Symposium titled “Data Representation and Organization Techniques” jointly organized by the DRTC, ISI Bangalore and the Metadata Research Centre, DREXEL UNIVERSITY (July 2-4, 2019).  
“Springer Nature Summit 2019 at Mahabalipuram ” (September 2-4, 2019).

Convened the one-day workshop titled “Copyright and Licensing Modalities in the Digital Era: Trends, Practices & Prospects” (February 13, 2020).

Judge for Essay and Slogan writing Competition at National Institute for Locomotor Disability Institute Kolkata on the Occasion of International Day of Persons with Disabilities 2019 (December 3, 2019) .

Resource person in the National Workshop on Koha (An open Source Solutions for Making Effective Library) at Bharatiya Vidya Bhaban Institute of Management Science, Kolkata (July 27-28, 2019).

**MONISANKAR BISHNU, EPU Delhi**

Research visit, Australian National University (Jun 10- 24, 2019)

**N. DAS, SQC&OR Unit Kolkata**

Paper presentation, 3rd Asia Pacific Management Research Conference, PPM School of Management, Bali, Indonesia (Nov 13-15, 2019)

**NABANITA DAS, ACMU Kolkata**

Chair, Poster Session, COMSNETS 2020, Bengaluru (Jan 07-11, 2020)

Panelist in the panel discussion organized by WIE, IEEE, Japan and to present a paper in i-CAST 2019-IEEE i-CAST, 2019 (Oct 23- 25, 2019)

**NILADRI SEKHAR DASH, LRU Kolkata**

Plenary Lecture, Refresher Course, Linguistics, UGC-Human Resource Development Centre, Ranchi University, Ranchi (Aug 02, 2019)

Plenary Lecture, Seminar-cum-workshop, Forensic & Corpus Linguistics, Centre for Linguistics, School of Languages, Literatures and Culture Studies, Jawaharlal Nehru University, New Delhi (Aug 10, 2019)

Invited Lecture, Dept. of Linguistics, Bharathiar University, Coimbatore, Tamil Nadu (Sep 12, 2019)

Invited Lecture, National Seminar on Approaches and Methods of English Language Teaching using CALL and CALTS, Dept. of English, Rathinam College of Arts & Science, Coimbatore (Sep 13, 2019)

Expert Lecture, Academic course on Preparing Digital Historical Corpus Edition: Textual and Corpus Annotation and Computing Tools, Dept. of English, Ravenshaw University, Cuttack, Odisha (Oct 18, 2019)

Invited Lecture, Dept. of Computer Science & Information Technology, Siksha o Anusandhan University, Bhubaneswar, Odisha (Oct 19, 2019)

Invited Lecture, International Workshop on Research in Culture & Humanities: Methodological Issues & Emerging Trends, Byanjanbarna Foundation, Jadavpur University, Salt Lake Campus, Kolkata (Oct 21, 2019)

Invited Lecture, DST Sponsored Short Term Course on Natural Language Processing, Department of CSE, NIT Rourkela, Odisha (Dec 06, 2019)

KeyNote Speaker, Symposium on Bridging Research on Cognition & Speech (BROCAS-2019), Dept. of HSS, Indian Institute of Technology, Ropar, Punjab (Dec 13, 2019)

Plenary Lecture, 2nd International Conference on Indigenous Languages: Towards Sustainable Multilingualism ((ICOIL-2), Indian Institute of Technology, Madras (Feb 15, 2020)

Invited Lecture, Short Term Course on Language and Linguistics, SLL, Jadavpur University, Kolkata (Feb 24, 2020)

KeyNote Speaker, 1st Workshop on Computational Linguistics and Bangla Language Processing (CLBLP-2019), Chittagong University of Engineering & Technology, Chittagong, Bangladesh (Sep 23- 25, 2019)

KeyNote Speaker, 2nd International Conference on Bengali Speech and Language Processing (ICBSLP2019), Shahjalal University of Science & Technology, Sylhet, Bangladesh (Sep 26- 28, 2019)

Paper Presentation, 35th South Asian Languages Analysis Roundtable, SALA-35, INALCO, Paris (Oct 29- 31, 2019)

Collaborative Research, School of Psychology and Clinical Language Sciences, Centre for Literacy and Multilingualism (CeLM), University of Reading, UK (Nov 02- 13, 2019)

Collaborative Research, Language and Brain Laboratory, Faculty of Linguistics, Philology and Phonetics, University of Oxford, UK (Nov 14- 23, 2019)

**PARTHANIL ROY, Stat-Math Unit Bengaluru**

Invited talk, 11th International conference on Extreme Value Analysis, held in Zagreb, Croatia (Jun 30-Jul 6, 2019)

Participated in the second edition of Knowledge Sum Oct 16-18, 2019)

**PARTHA PRATIM MOHANTA, ECSU Kolkata**

Paper Presentation, 2019 IEEE Region 10 Symposium (TENSYP 2019), IEEE Kolkata Chapter (Jun 07-09, 2019)

Invited Speaker, Workshop on Computer Vision and Multimedia Computing, Jadavpur University, Kolkata (Feb 10-17, 2020)

Plenary Speaker and Chair, Plenary session, National Conference on Trends in Science and Technology 2020, Salesian College, Siliguri (Feb 28-29, 2020)

**PARTHASARATHI GHOSH, GSU Kolkata**

Young Geomorphologists Training Programme, Indian Institute of Geomorphologists (IGI) Young Geomorphologists Forum, University of Calcutta, Kolkata (Mar 05, 2020)

Participation in workshop, Field Trip in Limagne Basin, University of Burgundy, Dijon, France (Oct 26, 2019)

Paper presentation conference, Microbialites: formation - evolution - diagenesis, University of Burgundy, Dijon, France (Oct 28, 2019)

**PRABAL ROYCHOWDHURY, EPU Delhi**

Visiting Fellow, Economics Department, Jadavpur University (Dec 02-04, 2019)

Collaborative Research, National University of Singapore (Sep 14-27, 2019)

**PRABIR KR. DAS**

National Seminar entitled "Special Needs Towards Inclusive Library Services in India" organized by NILD, Kolkata (Nov. 16-17, 2019). Web of Science Library Forum Meet 2019 (July 19, 2019).

**PRADIPTA MAJI, MIU Kolkata**

Invited Speaker, Workshop on Recent Trends in Machine Learning and IoT, National Institute of Technology, Durgapur (Jun 17-21, 2019)

External Expert, PhD Viva Voce Examination, Chennai Mathematical Institute, Chennai (Jul 03, 2019)

Invited Speaker, National Workshop on Computational Biology and Bioinformatics, IIT, Jodhpur (Aug 01-02, 2019)

Invited Speaker, Short Term Course on Machine Learning for Practitioners, Centre for Artificial Intelligence and Machine Learning, ISI, Kolkata (Nov 18-23, 2019)

Program Chair, 8th International Conference on Pattern Recognition and Machine Intelligence (PReMI2019), Tezpur University, Tezpur (Dec 17-20, 2019)

Invited Speaker, Short Term Course on Artificial Intelligence in Health Care, MCKV Institute of Engineering, Howrah (Feb 12, 2020)

Participant and Poster Presenter, EMBL Symposium: Multiomics to Mechanisms, Challenges in Data Integration, Heidelberg, Germany (Sep 11-13, 2019)

**PRIYADARSHI BANERJEE, ERU Kolkata**

Invited Talk, WEAI 15 International Conference, Tokyo, Japan (Apr 09-13, 2019)

**R. B. BAPAT, Stat-Math Unit Delhi**

Attended International Mathematical Olympiad as Observer B, University of Bath, UK (Jul 14-22, 2019)

Paper presentation, MATTRIAD Conference, Czech Republic (Sep 09-13, 2019)

**RABINDRANATH JANA, SRU Kolkata**

Paper presentation, 17th Annual Conference of the Indian Association for Social Sciences and Health (IASSH) in collaboration with School of Humanities and Social Sciences, IIT, Mandi (Dec 08-10, 2019)

**RAGHUNATH CHATTERJEE, HGU Kolkata**

To work on 3D culture of skin-Penn State College of Medicine, Hershey, PA, USA, (Feb 21-Mar 15, 2020)

**RAHUL ROY, Stat-Math Unit Delhi**

Workshop, Institute for Mathematical Sciences, National University of Singapore (May 27-30, 2019)

Conference, St. Petersburg (Jun 10-14, 2019)

Academic Visit, Institute of Mathematics Sinica, Taipei, Taiwan (Aug 14- 28, 2019)

Academic Visit, University of Warwick, UK (Sep 09-17, 2019)

Academic Collaboration, University of Waterloo (Oct 09-18, 2019)

Academic Visit, Shanghai New York University (Nov 25-Dec 06, 2019)

**RAJAT K. DE, MIU Kolkata**

To deliver a lecture, Workshop on Computational Biology and Bioinformatics, IIT Jodhpur (Jul 31-Aug 01, 2019)

To deliver a lecture, Educational Technology in Engineering Teaching (Jan 06-11, 2020)

To deliver a lecture as Chief Speaker, TEQIP-III Sponsored Two Days National Workshop on Artificial Intelligence and Machine Learning (AIML-2020), Gandhi Engineering College Bhubaneswar (Feb 28-29, 2020)

Paper presentation in conference, EMBO | EMBL Symposium: Multiomics to Mechanisms - Challenges in Data Integration, Heidelberg, Germany (Sep 11-13, 2019)

**RITA SAHARAY, ISRU Kolkata**

Oral presentation, International Conference on Statistics: Theory and Applications (ICSTA'19), Lisbon, Portugal (Aug 13- 14, 2019)

**RITUPARNA SEN, ASU Bengaluru**

Invited talk, 22nd Annual Conference of the Society of Statistics, Computer and Applications, Savitribai Phule Pune University, Pune (Jan 02-04, 2020)

Lectures, Workshop on Data Science in Finance, Chennai Mathematical Institute (Dec 16-18, 2019)

Invited talk, 62nd ISI World Statistics Congress, Kuala Lumpur, Malaysia (Aug 18 - 23, 2019)

**S. K. NEOGY, SQC&OR Unit Delhi**

Invited talk, International Conference on Business Analytics and Operations Research (ICBAOR2019), Manipal university, Mangalore (Jun 14-16, 2019)

Invited talk, Workshop on Graph Theory and its Applications, Delhi Technological University (DTU) (Nov 25-29, 2019)

Delivered a talk, International Conference on Mathematical Analysis and its applications (ICMAA-2019), South Asian University (Dec 14-16, 2019)

Session chair and talk, International Conference on Optimization techniques and its Applications (NACA-ICOTA2019), Future University Hakodate, Hakodate, Japan (Aug 26-31, 2019)

Delivered a talk, Indo-French Seminar on Optimization, Variational Analysis & Applications (IFSOVAA-2020) (Feb 2- 04, 2020)

**S. M. SUBHANI, SQC&OR Unit Hyderabad**

Trained Managers on Statistical Techniques for solving quality problems in the plant, In-house Training program on Basic Statistics using MINITAB, NATCO Pharma Ltd, Hyderabad (Jul 29-Aug 02, 2019)

Editor of "Design of Experiments" of the 3rd year UG course-Appointed course editor in Dr. B R Ambedkar Open University (Dec 01, 2019)

Thesis titled Fixed Point Theorem in Fuzzy Probabilistic Metric Space, Ph.D. awarded from Bhagwant University, Ajmer (Nov 01, 2019)

**SAMARJIT DAS, ERU Kolkata**

Visiting Faculty for the Fellow Programme in Management, Indian School of Business, Hyderabad (Jul 06-20, 2019)

**SAMIK BASU, Stat-Math Unit Kolkata**

Organizer and speaker, Workshop on Global homotopy theory, IIT, Bombay (Feb 10-14, 2020)

Speaker, Workshop on Lie groups and Lie algebras, North Bengal University (Mar 02-04, 2020)

**SAMIRAN DAS**

National Workshop on Koha (An open Source Solutions for Making Effective Library) at Bharatiya Vidya Bhaban Institute of Management Science, Kolkata (July 27-28, 2019).

**SANDIP DAS, ACMU Kolkata**

Program Co-Chair-International Conference on Algorithms and Discrete Applied Mathematics IIT Hyderabad (Feb 13-15, 2020)

Paper presentation, Barcelona, Spain (Jun 19- 21, 2019)

**SANGHAMITRA BANDOPADHYAY, MIU Kolkata**

LEAP-Excellence in Research and Innovation, MHRD-LEAP Initiative, Organized by IIT Kharagpur (May 17, 2019)

Fireside Chat with Sanghamitra Bandyopadhyay, Women in Data Science (WiDS) Conference, Intuit, Bengaluru (Jul 17, 2020)

Clustering in a Multiobjective Framework-IIT Roorkee, SPARC Workshop (Oct 15, 2019)

Special Talk in Face-to-Face Session with more than 1000 students, Artificial Intelligence: The Era of the Fourth Paradigm, India International Science Festival, Kolkata (Nov 06-07, 2019)

Panelist, Roundtable on Women in Science and Technology, CTBT: Science and Technology Conference, Vienna (Jun 24-28, 2019)

Oral presentation, CEFIPRA Annual Lecture, LIP6 Laboratory of Computer Science at Sorbonne University, Paris (Oct 15, 2019)

Oral presentation, CEFIPRA Annual Lecture, LiSSi, Universit Paris-Est Crteil, France (Oct 15, 2019)

Oral presentation, CEFIPRA Annual Lecture, LIGlab, Grenoble Institute of Technology (Oct 16, 2019)

Chair, Plenary Session on Artificial Intelligence and Mathematics, 2nd Knowledge Summit, a high-level Franco-Indian summit, Lyon, France (Oct 17-18, 2019)

Plenary Talk, Clustering, Optimization and Applications-International Conference on Applied Statistics, Dhaka (Dec 27- 29, 2019)

**SANKAR KUMAR PAL, CSCR Kolkata**

Kick off meeting with grantees, Grand Challenges India (GCI) - Immunizing Data - Innovating for Action (IDIA), Biotechnology Industry Research Assistance Council, (BIRAC), New Delhi (Apr 09-11, 2019)

Review of BTech. Curriculum proposal, and Keynote Talk, National Workshop on Data Science and Artificial Intelligence (WDSAI), IIT Bhubilai (Jul 01-04, 2019)

Keynote talk, Workshop on Transforming India with AI, and visit as Scholar-in Residence to mentor the AI and Data Science research at IIT Jodhpur (Aug 04-14, 2019)

Chief Guest at the Foundation Day Ceremony of CSIR-SERC, Chennai-CSIR-SERC, Chennai (Sep 27, 2019)

Special Lecture at Tathva'19 - Annual Techno Management Fest, NIT Calicut (Oct 18-20, 2019)

DST Meeting in Electrical Sciences, Andhra University, Visakhapatnam (Oct 22-24, 2019)  
 INSA INSPIRE Meeting (Engg. & Technology), INSA, New Delhi (Oct 30-31 and Dec 03-04, 2019)  
 Inaugural Talk on Data Science at E&ICT Academy (Edureka Prog), IIT Guwahati (Nov 01-02, 2019)  
 Invited Tal, STTP on Explainable Artificial Intelligence and Machine Learning for Multimedia Data, IIT Jammu (Dec 05- 07, 2019)  
 Plenary talk, 7th International Conference on Computers and Devices for Communication (CODEC) at Hotel Taj Gateway, Kolkata-Dept. of Radio Physics and Electronics, University of Calcutta (Host Institution) (Dec 19-20, 2019)  
 Keynote talk, International Conference on Artificial Intelligence and Applications (ICAIA 2020), Maharaja Surajmal Institute of Technology, New Delhi (Feb 06-07, 2020)  
 Visit as a Scholar-in-Residence to mentor the AI and Data Science research group, IIT Jodhpur (Feb 07-15, 2019)  
 Keynote talk, INAE Workshop on Recent Advances in Engineering and Technology, NIT Sikkim, Ravangla (Mar 01-05, 2020)  
 Collaborative Research, University of Maryland, College Park, MD, USA (Apr 28-May 05, 2019)  
 Invited Talk, University of Illinois, Urbana-Champaign (UIUC), IL, USA (May 07, 2019)  
 To attend the 38th International School of Hydraulics, Poland (May 19-26, 2019)  
 Invited Talk, 3rd Overseas Academicians Qingdao Tour & Qingdao International Academicians Conference, Qingdao, China (May 28-31, 2019)

#### **SANKAR SARKAR, PAMU Kolkata**

Two Invited lectures in AICTE QIP course on 'Hydrodynamics and sediment transport in unsteady flows' -Department of Civil Engineering, IIT Kharagpur (Oct 15-16, 2019)

#### **SANTANU K. MAITI, PAMU Kolkata**

Invited talk on Persistent current for beginners: Aharonov-Bohm effect and related issues, at the C. K. Majumdar Memorial Summer Workshop in Physics-Indian Association of Physics Teachers (Regional Council 15) [IAPT RC 15] held at S. N. Bose National Centre for Basic Sciences, Kolkata (May 28-Jun 07, 2019)

#### **SARBANI PATRANABIS-DEB, GSU Kolkata**

Paper presentation and scientific discussion during field visits, The International Geoscience Programme (IGCP) 648: Supercontinents and Earths Evolution field Conference in Madagascar, Tuliara University, Madagascar in collaboration with the University of Adelaide, Australia (Jun 21-Jul 08, 2019)

#### **SAROJ K. MEHER, SSIU Bengaluru**

Delivered THREE lectures on Machine Learning and Deep Learning at the FDP program, Aditya Institute of Technology and Management (AITAM), AP, India (Jun 16 -20, 2019)  
 Guest lecture, School of Computing and Information Technology, REVA University, Bengaluru (Aug 21, 2019)  
 Two KeyNote lectures, Faculty development program, National Institute of Science and Technology, Berhampur, Odisha, under the scheme TEQUIP III (Sep 25-26, 2019)  
 Four KeyNote lectures, Faculty development program, Department of Computer Science and Engineering, University Visvesvaraya College of Engineering, Bengaluru (Sep 23-27, 2019)  
 Guest lecture, PES University, Bengaluru (Oct 10, 2019)  
 KeyNote lecture, Faculty Development Program, Department of Information Technology, Mepco Schlenk Engineering College Sivakasi (Nov 11 -12, 2019)  
 KeyNote lecture, International conference on Biologically Inspired Techniques in Many-Criteria Decision Making (BITMDM-2019),

Fakir Mohan University, Balasore, Odisha (Dec 19-20, 2019)  
 KeyNote lecture, FDP program on Machine learning and its application, BGS Institute of Technology, Adichunchanagiri University (Jan 22 -27, 2020)  
 KeyNote lecture, Continuing Education Programme (CEP) on Machine Learning in Radars, LRDE (Electronics & Radar Development Establishment), DRDO, Bengaluru (Jan 27 -31, 2020)  
 KeyNote lecture, 2nd International Conference on Emerging Trends and Advances in Electrical Engineering and Renewable Energy (ETAEEER-2020), Kalinga Institute of Industrial Technology (KIIT), Bhubaneswar (Mar 05-06, 2020)

#### **SASWATI DAS, ERU Kolkata**

Paper presentation, North South University, Dhaka, Bangladesh (Apr 03- 05, 2019)

#### **SAURABH GHOSH, HGU Kolkata**

Invited Lecture in Workshop, Indian Agricultural Statistics Research Institute (Nov 08, 2019)  
 Invited Speaker in Panel Discussion, Indian Society of Medical Statistics Annual Meeting (Dec 03-05, 2019)  
 Conference, European Mathematical Genetics Meeting, Dublin (Apr 07 - 08, 2019)  
 Collaborative Research, Institute of Statistical Sciences, Academia Sinica (Aug 03 - 07, 2019)  
 Collaborative Research, Qatar Computing Research Institute (Nov 03-06, 2019)  
 Conference, Pan Arab Human Genetics Meeting, Dubai (Jan 18-19, 2020)  
 Collaborative Research, National University of Singapore (Feb 12-15, 2020)

#### **SHANTA LAISHRAM, Stat-Math Unit Delhi**

Workshop on Additive Combinatorics, ICTS, Bengaluru (Mar 02-06, 2020)  
 Workshop and Lectures, Manipur University (Sep 30- Oct 10, 2019)  
 Attended EGMO 2019, Ukraine (Apr 08-12, 2019)  
 Attended Workshop FWDERP 2019, Bursa Uludag University, Gorukle Campus, Bursa, Turkey (Jul 05-Jul 09, 2019)  
 First JNT Biennial Conference, Cetraro, Italy (Jul 22-26, 2019)  
 Knowledge Submit, Lyon, France (Oct 16-19, 2019)

#### **SHILADRI SEKHAR DAS, GSU Kolkata**

North American Paleontological Convention (NAPC), Symposium on Paleontological History of the Indian subcontinent, 11th Convention at University of California, Riverside, California, USA (Jun 23-27, 2019)

#### **SIVA ATHREYA, Stat-Math Unit Bengaluru**

Attended the research programme, Small ball probability estimates for SPDEs", Centre International de Rencontres Mathematiques, France (Jul 9-19, 2019)  
 Faculty visitor, Department of Statistics at Seoul National University, Korea (Nov 24- 28, 2019)

#### **SMARAJIT BOSE, ISRU Kolkata**

Oral Presentation, 8th International Conference on Software and Computing Technologies (ICSCCT 2019), Hong Kong (Apr 05 - 07, 2019)  
 Collaborative research with Prof. Ananda Sen, University of Michigan, USA (Oct 11 - 21, 2019)

#### **SOUMYANETRA MUNSHI, ERU Kolkata**

Presented paper on Criminality and Clientelism: A Game-theoretic Exploration, IIT, Kanpur (Jul 13-14, 2019)

**SOURAV CHAKRABORTY, ACMU Kolkata**

Research Collaboration visit, Microsoft Research, Bengaluru (Apr 01-03, 2019)

Invited speaker, Algorithmic Tractability via Sparsifiers (A-TVS) (Aug 09-12, 2019)

Research Collaboration visit, TIFR, Mumbai (Sep 18-21, 2019)

Research Collaboration visit and invited speaker, IIT Kharagpur (Jan 20-21, 2020)

Research Collaboration and invited speaker, National University of Singapore (Nov 30- Dec 07, 2019)

**SOUVIK ROY, ERU Kolkata**

Collaborative Research work, IIT, Madras (Aug 21-27, 2019)

Presented a paper, International Conference on Game Theory and Networks, Department of Economics, Dibrugarh University, Assam (Sep 06-07, 2019)

Invited Talk, Department of Economics, Ashoka University, Haryana (Oct 16, 2019)

**SUBHAS C NANDY, ACMU Kolkata**

Research Collaboration and Invited Speaker at Discrete & Computational Geometry, Day-Ben Gurion University, Israel (Jul 08-20, 2019)

**SUDHEESH K. KATTUMANNIL, ASU Chennai**

Post doc/Collaborative research, City University of Hong Kong, China (May 02 - Sep 02, 2019)

**SUJATA GHOSH, CSU Chennai**

Invited Speaker, Inauguration Workshop of Women in Math, IIT Delhi (April 13, 2019-April 13, 2019)

Invited Speaker, Summer School for Women in Mathematics and Statistics, ICTS Bengaluru (May 13-24, 2019)

Invited Speaker, Summer School on Representation in AI (RinAI 2019), IIT Mandi (Jun 06-13, 2019)

Invited Speaker, Second ACM Grad Cohort 2019, IIT Delhi (Jul 06-07, 2019)

Academic visit and Presentation of paper, Hokkaido University, Japan (Nov 11- 17, 2019)

To decide on the recipient(s) of the prize among the nominated theses, Jury member in E.W. Beth Dissertation Prize Committee (Aug 01- 31, 2019)

**SUPRATIK PAL, PAMU Kolkata**

Invited talk, Centre for Theoretical Studies, IIT Kharagpur (Sep 11, 2019)

Invited talk, Vigyan Samagam, an event by DST and DAE, Govt of India, Science City, Kolkata (Dec 10-14, 2019)

Invited talk, National Seminar on Applications of Statistics in Natural Sciences, St Xavier's College, Kolkata (Dec 16-Jan 17, 2019)

Invited talk, National Seminar on Mathematical Sciences - 2020, Burdwan University (Jan 09-11, 2020)

Invited talk, International Conference on the Emerging Issues in Cosmology and Particle Physics, Visva Bharati University, Santiniketan (Jan 12-14, 2020)

Invited talk, Workshop on Astronomy and Astrophysics for Women in India, Diamond Harbour Women's University, West Bengal (Jan 31-Feb 02, 2020)

Invited visit, International Centre for Theoretical Physics, Trieste, Italy (Jul 29-Aug 16, 2019)

Invited talk, CosmoCruise 2019: From the Early to the Late Universe, Venice, Italy (Aug 18-25, 2019)

**SUSHMITA MITRA, MIU Kolkata**

General Chair, 8th International Conference on Pattern Recognition and Machine Intelligence, Tezpur (Dec 17-20, 2019)

Collaborative research and lectures, Fulbright Fellowship, USF Tampa, Florida, USA (Dec 15-Mar 15, 2020)

**SUSMITA BHARATI, SRU Kolkata**

Paper presentation, 16th International Conference on Urban Health in Xiamen, International Society for Urban Health, Xiamen, China (Nov 04- 08, 2019)

Paper presentation, 2nd International Conference on Applied Statistics, Dhaka University, Dhaka (Dec 27- 29, 2019)

**SUSMITA MUKHOPADHYAY, BAU Kolkata**

Oral Presentation, 11th International Association of Gerontology and Geriatrics Asia/ Oceania Regional Congress, Taipei, Taiwan (Oct 23 - 27, 2019)

**SUSMITA RUJ, CSRU Kolkata**

Invited Speaker, ICTS, Bangalore (Jan 15-17, 2020)

**SUSMITA SUR-KOLAY, ACMU Kolkata**

Expert, Faculty Excellence Award Selection Committee, IIT Kharagpur (Aug 07, 2019)

Expert, Faculty Selection Committee, IISER Kolkata (Aug 28, 2019)

Invited Speaker, Indian International Science Festival (IISF-2019), Kolkata (Nov 05-08, 2019)

Invited Speaker, Faculty Development Programme on Quantum Intelligence, RCCIIT (Nov 02-14, 2019)

Paper Presenter and Session Chair, Asian Test Symposium 2019 (Dec 10-13, 2019)

Steering Committee Member, Technical Program Committee Member, Session Chair, The 33rd International Conference on VLSI Design & The 19th International Conference on Embedded Design (Jan 04-08, 2020)

Expert, Faculty Promotion Committee-DA-IICT, Gandhinagar (Jan 23, 2020)

Invited Speaker, World Engineering Day, UEM (Mar 04, 2020)

Invited Speaker, 3rd International Symposium on Devices, Circuits and Systems, IEST (Mar 05-06, 2020)

Research Collaboration, IBM T J Watson Laboratories, Yorktown Heights, NY, USA (Jul 09- 10, 2019)

Nelms Institute Seminar Speaker, U. Florida, Gainesville, FL, USA (Jul 11, 2019)

IEEE Computer Society Lecture, U. South Florida, Tampa, FL, USA (Jul 12, 2019)

Paper Presenter, Steering Committee Member, IEEE Computer Society Annual Symposium on VLSI, Miami, FL, USA (Jul 15- 17, 2019)

Research Discussion, Tel-Aviv University, Israel (Sep 12, 2019)

Research Collaboration and invited talks at Center for Quantum Science and Technology, and Cyber Security Research Center-Ben-Gurion University of the Negev, Israel (Sep 13, 2019)

Invited talk and research discussion, Technion, Haifa, Israel (Sep 22, 2019)

**SWAGATAM DAS, ECSU, Kolkata**

Keynote Talk, International Conference on Computational Mathematics and its Applications (CMA 2019), IIT Indore (Nov 12- 14, 2019)

Keynote Talk, 21st International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2019, University of Timisoara, Romania (Sep 04- 08, 2019)

Research collaboration and lectures, VSB TU Ostrava, Czech Republic (Sep 03- 17, 2019)

Oral presentation, International Conference on Computer Vision (ICCV), Seoul, Korea (Oct 27- Nov 02, 2019)

Research collaboration and lectures, Kyungpook National University, Daegu, Korea (Nov 03- 10, 2019)

External expert for Ph. D. thesis defence, Université Paris EST and Data Science Tech Institute, Paris, France (Dec 19- 22, 2019)

**T. KARTHICK, CSU Chennai**

Invited Speaker, Role of Mathematics in Technology and Industries/SDNB Vaishnav College, Chennai (Feb 07-08, 2020)  
 Invited Speaker, National Seminar on Pure and Applied Mathematics/National College, Trichy (Feb 21, 2020)  
 Invited Speaker, 23rd Ramanujam Symposium, National conference on Graph Theory and its Applications/ Ramanujan Institute of Advanced Study in Mathematics, Chennai (Mar 04-06, 2020)  
 Invited Speaker, Workshop on Graphs, Structures and Algorithms/IMSc, Chennai (Nov 28-29, 2019)

**T. K. MANDAL**

1) MOOCS course of Coursera on "Copyright for Educators and Librarians" jointly offered by Duke University, The University of North Carolina at Chapel Hill and University Emory University, December 2019 with Distinction  
 2) ARPIT course through Swayam, GOI on "Emerging Trends & Technologies in Library & Information Services (ETTLIS) during September 2019-January, 2020 with "A" Grade conducted by IIT Delhi.  
 Delivered invited lectures in One Day National Seminar on 'Knowledge Resource Management: E-Learning and Information Search' on 29th June 2019 at The Bhawanipur Education Society College & IQAC Behala College, Kolkata.  
 3) Resource person in 4th International Conference of Asian Libraries, ICAL 2020 "Managing Libraries: Sustaining Excellence through Innovation, Technology and Repositioning is being Jointly Organized by Indian Institute of Management(IIM), Lucknow & Asian Library Association (ASIALA), New Delhi (February 26-28, 2020).  
 4) Invited lectures In the State Level Seminar on "e-Learning: Content Creation and Delivery", Acharya Jagadish Chandra Bose College, Kolkata ( February 29, 2020).

**TANVI JAIN, Stat-Math Unit Delhi**

Summer School for Women in Mathematics and Statistics, ICTS-TIFR, Bangalore (May 13-15, 2019)  
 Lecture to undergraduate mathematics students, Daulatram College, University of Delhi (Sep 20, 2019)  
 Regional Workshop organized by Indian Women in Mathematics (IWM)-NIT, Meghalaya (Oct 18-22, 2019)  
 Talk, IIT Mumbai (Jan 07-09, 2020)  
 Conference "IWOTA 2019" Geometry of linear operators and operator algebras, Lisbon, Portugal (Jul 22-26, 2019)  
 Academic visit, CEAFL Seminar, University of Lisbon, Portugal (Jul 26-30, 2019)

**TAPAN CHAKRABORTY, GSU Kolkata**

Collaborative research and Talk, University of California, Riverside (May 7, 2019)  
 Collaborative Research with N. Kar and Richard Smith-College at Brockport, State University of New York (May 20, 2019)  
 Research and Fieldwork on the Quaternary Deposit of NE Slovakia and discussion on the fieldwork in North Bengal, Technical University of Kosice, Slovakia, Erasmus + Fellowship (Jul 1, 2019)  
 Oral presentation, 2019 China ASEAN Marine Geoscience Conference, Qingdao National Laboratory for Marine Science and Technology, China (Sep 18, 2019)

**TARUN KABIRAJ, ERU Kolkata**

External Member, Board of Studies Meeting-Department of Economics, West Bengal State University (Apr 30- Jun 26, 2019 & Nov 24-Apr 30, 2019, Jun 26- Nov 24, 2019)  
 External Member, Screening-cum-Evaluation Committee, Department of Economics, Visva-Bharati University, Santiniketan (Jun 22, 2019)

**TRIDIP RAY, EPU Delhi**

Invited for Seminar, Presidency University, Kolkata (Apr 30, 2019)  
 Conference, Society for Economic Research in India Annual Conference, IIT Kanpur (Jul 13-14, 2019)  
 Plenary talk, 23rd Biennial Conference of Association of Indian Economic and Financial Studies (AIEFS) Xavier University, Bhubaneswar, Odisha (Jul 29-30, 2019)  
 Invited for Seminar, Shiv Nadar University, Greater Noida (Nov 08, 2019)  
 Invited for Seminar, Institute of Economic Growth, Delhi (Feb 21, 2020)  
 Meeting of Advisory Committee, Department of Educational Finance, National Institute of Educational Planning and Administration (NIEPA), New Delhi (Feb 25, 2020)

**UJJWAL BHATTACHARYA, CVPRU Kolkata**

Examiner, PhD Viva Voce, IIT Guwahati (Aug 06, 2019)  
 Resource person, Advanced Course on Digital Image Processing & Machine Learning, Department of Science & Technology and Biotechnology, GoWB (Sep 23-27, 2019)  
 Resource person, Workshop on Some Aspects of Computational Mathematics, Savitribai Phule Pune University, Pune (Dec 10-14, 2019)  
 Resource person, Workshop on Computer Vision and Multimedia Computing, Jadavpur University (Feb 10-17, 2020)  
 Paper Presentation, 30th British Machine Vision Conference (Sep 09- 12, 2019)

**UMAPADA PAL, CVPRU Kolkata**

General Co-Chair, 15th International Conference on Document Analysis and Recognition, (Sep 20- 26, 2019)  
 General Co-Chair-5th Asian Conference on Pattern Recognition (Nov 26- 30, 2019)  
 Collaborative research, University of Technology, Australia (Nov 20- 26, 2019)  
 IAPR Fellow section committee member, International Association of Pattern Recognition (Jan 31, 2020)  
 Keynote talk, The 3rd International Conference on Recent Trends in Image Processing & Pattern Recognition, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, Maharashtra (Jan 03-04, 2020)  
 Delivered a Talk, Faculty Development Program at the Department of CSE, IEM Kolkata (Mar 03, 2020)

**UTPAL GARAIN, CVPRU Kolkata**

PhD Viva Voce Examination, Anna University (Jul 15, 2019)  
 Speaker, CII ICT East 2019 (Sep 10-11, 2019)  
 PhD Viva Voce Examination, IIT Patna (Sep 30, 2019)  
 Delivered a lecture, Short-term course on Machine Learning for Practitioners (Nov 18-23, 2019)

**YOGESHWARAN DHANDAPANI, Stat-Math Unit Bengaluru**

Participated and gave a talk, IFCAM School on Graphs and Random Processes, IISER Pune (December 16- 20, 2019)  
 Talk, Singapore-Abu Dhabi-Shanghai-India Probability Meeting, NUS, Singapore (May 25-27, 2019)  
 Participated in 20th Workshop on Stochastic Geometry, stereology and image analysis, Denmark (Jun 02-06, 2019)  
 Research collaboration with Bartłomiej Blaszczyzyn (under IFCAM) and discussions with Francois Baccelli, Justin Salez and Raphael Lachieze-Rey, ENS-INRIA, Paris (Nov 11-22, 2019)  
 Research collaboration with Frank den Hollander, Giovanni Peccati and Guenter Last, Leiden University, Netherlands; Univ. Luxembourg, Luxembourg ; Karlsruhe Institute of Technology, Germany (Feb 26-Mar 07, 2020)  
 Participated in Workshop on Point processes and unimodular random graphs INRIA, Paris (Mar 20-22, 2019)

## 6.5 Visiting Scientist

### Applied Statistics Division (ASD)

#### ASU, Kolkata

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Farha Sultana	IIT, Patna	Apr 01-Sep 30, 2019
2	Shyamal Ghosh	IEST, Shibpur	Oct 22-Jan 31, 2019
3	Dibyendu Roy	SERET, Kolkata	Jan 01-Mar 31, 2020

#### ISRU

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Sayantana Banerjee	Indian Institute of Management Indore	May 27-Jun 21, 2019
2	Rajarshi Mukherjee	Harvard University, Boston, USA	May 25-Jun 16, 2019
3	Sabyasachi Mukhopadhyay	Indian Institute of Management Udaipur	Oct 23-Nov 15, 2019

### Biological Sciences Division (BSD)

#### BAU

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Charles Weitz	Department of Anthropology, Temple University, Philadelphia, USA	May 08-Sep 07, 2019

### Computer and Communication Sciences Division (CCSD)

#### ACMU

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Arkadev Chattopadhyay	TIFR Mumbai	Apr 16-18, 2019
2	Saket Saurabh	Institute of Mathematical Sciences (IMSC)	Apr 29-May 03, 2019
3	William K. Moses Jr.	Technion, Israel Institute of Technology, Israel	Apr 26-27, 2019
4	Joydeep Mukherjee	Ramkrishna Mission Vivekananda University	Apr 01-Jun 30, 2019
5	Sudipa Roy	Duke University	May 27, 2019
6	Debmalya Panigrahi	Duke University	May 28, 2019
7	Apurba Das	National University of Singapore	May 30, 2019
8	Rishiraj Bhattacharyya	National Institute of Science Education (NISER), Bhubaneswar	Jun 03-14, 2019
9	Minati De	Department of Mathematics, Indian Institute of Technology, Delhi	Jun 21-Jul 06, 2019
10	Krishnendu Chakrabarty	Department of ECE, State of North Carolina	Jun 21, 2019
11	Partha Pratim Pande	Washington State University	Jul 24, 2019
12	Bapi Kar	Nanyang Technological Institute, Singapore	Oct 03-Dec 30, 2019
13	Nitin Saurabh	Technion, Israel Institute of Technology, Israel	Nov 04-08, 2019
14	Ashok Pradeesha	IIT Bangalore, India	Dec 06-11, 2019
15	Rolf Drechsler	University of Bremen/DFKI, Germany	Dec 09-12, 2019

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
16	Amit Gurung	Martin Luther Christian University, Shillong, Meghalaya, India	Dec 16-27, 2019
17	Amitabh Trehan	Loughborough University, UK	Jan 03-08, 2020
18	Richa Andrea	Arizona State University, USA	Jan 08, 2020
19	Debsoumya Chakraborti	Carnegie Mellon University, Pittsburg, USA	Jan 10, 2020
20	Rajat Mittal	IIT Kanpur	Jan 11-26, 2019
21	Sagnik Mukhopadhyay	KTH Royal Institute of Technology, Sweden	Jan 27, 2020
22	Florent Foucaud	Bordeaux, France	Jan 26-Feb 05, 2020
23	Suchismita Mishra	IIT Madras, Chennai, Tamilnadu, India	Feb 01-05, 2020
24	Eric Sopena	Bordeaux, France	Feb 01-05, 2020
25	Dimitri Lajou	Bordeaux, France	Feb 01-05, 2020
26	Michel Habib	Paris, France	Feb 01-05, 2020
27	Reza Naserasr	IRIF, Université de Paris	Feb 03-07, 2020
28	Arnab Sinha	Amazon USA	Feb 03, 2020
29	Swagato Sanyal	IIT Kharagpur, India	Feb 18-22, 2020
30	Yuval Filmus	Technion, Israel Institute of Technology, Israel	Feb 18-23, 2020
31	Prahladh Harsha	TIFR Mumbai	Feb 18-21, 2020
32	Amey Bhangale	University of California, Riverside	Feb 18-21, 2020
33	Rahul Jain	National University of Singapore	Feb 18-21, 2020
34	Arnab Bhattacharyya	National University of Singapore	Feb 18-21, 2020
35	Diptarka Chakraborty	National University of Singapore	Feb 18-21, 2020
36	Anupa Sunny	IRIF, Université de Paris	Feb 18-26, 2020
37	Suhail Sherif	TIFR Mumbai	Feb 18-21, 2020
38	Sutanu Gayen	National University of Singapore	Feb 24, 2020
39	Joshi Rajiv V	T. J. Watson Research Center, IBM Yorktown Heights, USA	Mar 11-13, 2020
40	Anil Maheshwari	Carleton University, Canada	Mar 17-22, 2020

### CSU, Chennai

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Torben Braüner	Roskilde University, Denmark	Nov 24-Dec 05, 2019

### CVPRU

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Abhijit Das	University of Southern California, USA	Jan 01-Mar 31, 2020

### DRTC

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Saiful Amin	Director, Semantic Consulting services Pvt. Ltd.	Jan 01-Jun 30, 2020
2	Arun Prasad	Founder & CEO of I-Enterprise a' Internet of Things' Big data Analytics company	Jan 01-Jun 30, 2020

## SSIU

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Gustav Camps-Valls	University of Valencia	Nov 22, 2019


**Physics and Earth Sciences Division (PESD)**

## GSU

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Walter Joyace	Université de Fribourg, Department of Geoscience, Switzerland.	Sep 12-19, 2019
2	Tariq Abdul Kareem	LSA Museum of Paleontology, University of Michigan	Jul 01-16, 2019
3	Sergio Da Silva	Santa Maria University, Brasil	Nov 02-17, 2019
4	Nigel Hughes	University of California, Riverside	Nov 07, 2019-Mar 18, 2020
5	Michael De Cock	Department of Geology, University of Johannesburg, SA	Jan 08-21, 2020
6	Dawn Yvonne Sumner	University of California, Davis, USA	Feb 24-Mar 04, 2020
7	Linda christine Kah	Department of Earth and Planetary Sciences, University of Tennessee, USA	Feb 24-Mar 04, 2020
8	Juraj Janocko	Vice-Dean, Faculty of Mining, Ecology, Process Control and Geotechnologies Institute of Geosciences, Technical University of Kosice, Slovakia	Jan 20-Feb 02, 2020

## PAMU

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Moumita Patra	Rupnagar, Sonarpur, West Bengal	Apr 01-Jun 30, 2019
2	Swapan Rana	University of Warsaw, Poland	June 29, 2019
3	Souvik Paramanik	Santipur, Nadia, West Bengal	Jun 01-Aug 31, 2019
4	Suratna Das	Department of Physics, IIT Kanpur	Jun 01-Aug 31, 2019
5	Dheeraj Kumar Mishra	Institute of Mathematical Science, Chennai	Aug 01-Sep 24, 2019
6	Suman Chatterjee	Department of Physics, IIT, Kharagpur,	Dec 01, 2019-Feb 28, 2020
7	Sourabh Kumar Maurya	Department of Mathematics, NIT, Patna	Dec 01, 2019-Feb 28, 2020
8	Prosenjit Kundu	National Institute of Technology, Durgapur	Dec 02, 2019-Jan 31, 2020
9	Gopal Chandra Sardar	Department of Physical Sciences, IIT-Jodhpur	Mar 13-Jun 12, 2020


**Social Sciences Division (SSD)**

## EAU

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Aardra Surendran	TISS Mumbai	Mar 18-31, 2020
2	D. Narayana	GIFT, Trivandrum	Dec 16-19, 2019
3	V. Surjit	NIRD, Hyderabad	Jul 11-14, 2019

## EPU

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Willima Wadhwa	ASER Centre, New Delhi (India)	Jul 22-Nov 30, 2019
2	Chirag Anand	Independent IT Consultant, New Delhi	Jul 22-Nov 30, 2019
3	Chandan Jain	Ashoka University, Sonipat( India)	Aug 01-31, 2019
4	Reza Che Daniels	School of Economics, University of Cape Town (South Africa)	Jan 06-May 06, 2020
5	Gurbachan Singh	Management Development Institute Gurugram (India), Ashoka University Sonipat (India), ISI Delhi (India)	Jan 06-May 06, 2020
6	Bharat Ramaswami	Ashoka University, Sonipat (India)	Feb 01-May 31, 2020
7	Pawan Gopalakrishnan	Reserve Bank of India, Mumbai (India)	Feb 01-29, 2020
8	Sonal Yadav	University of Umea, Sweden	Feb 19-Mar 07, 2020

## ERU

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Suresh Mutuswami	Department of Economics, University of Leicester, United Kingdom	Apr 01-Jun 30, 2019
2	Srobonti Chattopadhyay	Department of Economic, Vidyasagar College for Women, Kolkata – 700006, West Bengal	May 20-Jun 30, 2019
3	Anuj Bhowmik	Department of Economic, Indira Gandhi Institute of Development Research, Mumbai - 400 065	May 13-May 31, 2019 & Feb 12-21, 2020
4	Bikas K. Chakraborty	Centre for Applied Mathematics & Computational Science, Saha Institute of Nuclear Physics	Aug 01, 2019-Jul 31, 2020
5	Rittwik Chatterjee	Centre for Studies in Social Sciences, Kolkata – 700094, West Bengal	Jul 10-Aug 09, 2019 & Jan 01-Mar 31, 2020
6	Anuradha Saha	Department of Economics, Ashoka University, Haryana	Dec 15, 2019-Jan 15, 2020
7	Utpal Kumar De	Department of Economic, North-Eastern Hill University, Shillong, Meghalaya	Jan 09-27, 2020

## LRU

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Atanu Saha	Jadavpur University	May 20, 2019
2	Amrita Basu	Jadavpur University	May 20, 2019
3	Sibasis Mukherjee	Language Division, Ministry of HA	Jun 03, 2019
4	Sucharita Mitra	Language Division, Ministry of HA	Jun 03, 2019
5	Nishant Nepali	Language Division, Ministry of HA	Jun 03, 2019
6	Rupam Gupta	MS University, Baroda	Jun 07-08, 2019
7	Moshiul Hoque	Chittagong University of Engg & Tech, Bangladesh	Jun 10-12, 2019
8	Sayantani Banerjee	IIT Delhi	Oct 11-12, 2019
9	Shantanu Ghosh	Akaltakh University Bhatinda, 9-10 December 2019.	Dec 09-12, 2019
10	Aditi Lahiri	Oxford University, UK	Jan 03-04, 2020
11	Durjay Lahiri	SSKM Hospital, Kolkata	Jan 24, 2020
12	Sudipta Nandi	Duttanagar Mental Hospital	Feb 06, 2020
13	Priyanka De	Duttanagar Mental Hospital	Feb 06, 2020
14	Atul Aman	DLA University, Mathura	Feb 10-11, 2020
15	Indranil Acharya	Vidyasagar University, West Bengal	Feb 14, 2020

**PSU**

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Subrata Lahiri	Ex-Officiating Director of International Institute for Population Sciences, Mumbai	Nov 13-19, 2019

**PRU**

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Rama Manna	Indian Institute of Psychometry, Kolkata.	Oct 15, 2019
2	Rita Karmakar	Amity Institute of Psychology and Allied Sciences. Amity University Kolkata	Oct 16, 2019
3	K.S. Sengar	Additional Professor, Department of Clinical Psychology, Ranchi Institute of Neuropsychiatry & Allied Sciences (RINPAS), Kanke.	Jan 15-17, 2020
4	Susmita Halder	Associate Professor, Clinical Psychology, Amity Institute of Behavioural Health & Allied Sciences, Amity	Jan 15, 2020
5	Sreetama Chatterjee	Clinical Psychologist, Institute of Psychiatry, Centre of Excellence	Jan 16, 2020
6	Sahely Ganguly	C.C.P.P., AMRI Hospital, Dhakuria	Sep 12, 2019
7	Nilanjana Maulik	Secretary and National Coordinator Working Group ARDSI	Sep 12, 2019
8	Nishi Pulgurtha	Dept. of English, BKC College, Kolkata	Sep 12, 2019
9	Aparna Dutta	Consultant Neuropsychology & Clinical Psychology Unit, Duttanagar Mental Health Centre	Sep 12, 2019

**Statistical Quality Control & Operations Research Division****SQC & OR Unit, Kolkata**

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Shuvashree Mondal	IIT, Kanpur	Apr 01-Oct 02, 2019

**Theoretical Statistics and Mathematics Division****Stat-Math Unit, Bangalore**

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	M. Aneesh	NBHM Post-Doctoral Fellow	Apr 02, 2018-Nov 30, 2019
2	V. P. Anoop	NISER Bhubaneshwar	Nov 01, 2019-Feb 27, 2020
3	Aswin Balasubramanian	Rutgers University, USA	Oct 02-04, 2019
4	Tathagata Banerjee	NPDEF Post-Doctoral Fellow	Sep 01, 2017-Mar 31, 2020
5	Animesh Bhandari	National Institute of Technology, Meghalaya	Feb 06-Mar 31, 2020
6	Suprio Bhar	IIT Kanpur	Sep 14-Sep 21, 2019
7		IIT, Kanpur	Jul 01-06, 2019
8	U.N. Bhosle	INSA Senior Scientist	From Jan 01, 2019 for three years
9	Rekha Biswal	Max Planck Institute for Mathematics, Germany	Sep 09-13, 2019
10	Snehasish Bose	NBHM Post-Doctoral Fellow	From Feb 01, 2019 for two years

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
11	Adam Bowdtich	National University of Singapore	Sep 21-30, 2019
12	Yann Bugeaud	Universite de Strasbourg, France	Feb 23-29, 2020
13	Apratim Chakraborty	Stony Brook University, USA	Sep 09, 2019-Mar 31, 2020
14	Chitradipa Chakraborty	IIT Kanpur	Jun 01- Nov 30, 2019
15	Shauri Chakraborty	S.N. Bose National Centre for Basic Sciences, Kolkata	Sep 15-19, 2019
16	Manoj Choudhuri	IITRAM, Ahmedabad	Jun 08-22, 2019
17	Kajal Das	IMPAN, Warsaw	Sep 18-24, 2019
18	Pradeep Das	HRI, Allahabad	Jan 20, 2019-Mar 31, 2020
19	Sandipan De	NBHM Post-Doctoral Fellow	Feb 01, 2017-Mar 17, 2020
20	Shaunak Vilas Deo	TIFR, Mumbai	Sep 21-25, 2019
21	Koushik Dhara	IIT Madras	Oct 01, 2019-Mar 31, 2020
22	Dhriti Ranjan Dolai	INSPIRE Faculty Fellow	Sep 01, 2017 & Jul 01, 2017 - Jul 14, 2019
23	Anindya Ghatak	NISER Bhubaneswar	Apr 01, 2019- Mar 31, 2020
24	Nirupam Ghosh	Visvesvaraya Institute of Technology, Nagpur	Nov 18, 2019-Mar 31, 2020
25	Akshay Goel	Kyushu University, Japan	Oct 14, 2019-Mar 31, 2020
26	Subhajit Goswami	IHES, Paris	Jul 22-25, 2019
27	Purvi Gupta	Rutgers University, USA	Jun 26-Jul 02, 2019
28	Kalpesh Haria	IIT Mandi	Jul 22-Aug 02, 2019
29	Sanjoy Kumar Jhavar	IISc., Bangalore	Jan 20, 2019-Mar 31, 2020
30	Jianping Jing	NYU Shanghai, China	Sep 28-Oct 06, 2019
31	Apton Klymovsky	University of Duisburg-Essen	Aug 14-27, 2019
32	Lavy Koilpitchai	NBHM Post-Doctoral Fellow	From Jul 01, 2019 for two years
33	Santhosh P. Kumar	NBHM Post-Doctoral Fellow	From Apr 02, 2018 for three years
34	Wolfgang Lohr	University of Duisburg-Essen	Aug 12-29, 2019
35	Neha Malik	University of Delhi	Apr 01-Oct 31, 2019
36	Nirupama Mallick	IMSc., Chennai	Jun 30-Jul 07, 2019
37	S. Manikandan	HRI, Allahabad	Aug 08-Dec 31, 2019
38	Eshita Mazumdar	IIT, Jammu	Aug 20, 2019-Mar 31, 2020
39	Satyendra Kumar Mishra	IIT Kanpur	Jul 01, 2019-Mar 31, 2020
40	Manil Mohan	IIT Roorkee	May 24-31, 2019
41	P. Muthukumar	NBHM Post-Doctoral Fellow	From Apr 01, 2019 for two years
42	Saranya G. Nair	NBHM Post-Doctoral Fellow	Mar 31, 2017-Jul 31, 2019
43	Debanjan Nandi	TIFR, Mumbai	Sep 18-22, 2019
44	Soumyashant Nayak	University fo Pennsylvania	Aug 25-28, 2019
45	Aprameyo Pal	University of Duisburg-Essen	Aug 15-17, 2019
46	Deepak Kumar Pradhan	NBHM Post-Doctoral Fellow	From Jul 01, 2019 for two years
47	Rameez Raja	TIFR, Mumbai	Dec 02, 2019-Mar 31, 2020
48	Narayan Rakshit	NBHM Post-Doctoral Fellow	From Apr 01, 2019 for two years
49	Koteswara Rao	NBHM Post-Doctoral Fellow	Sep 27, 2017-Sep 11, 2019

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
50	Jishnu Ray	University of British Columbia	Jul 15-19, 2019
51	S. Nanda Kishore Reddy	INSPIRE Faculty Fellow	From Apr 02, 2018 for five tears
52	Arnab Saha	IIT, Gandhinagar	Jul 29-Aug 02, 2019
53	Gunjan Sapra	Graduate School of science, Kyoto	Apr 01, 2019-Mar 31, 2020
54	P. Shankar	NBHM Post-Doctoral Fellow	From Jul 01, 2019 for two years
55	Abhay Soman	IISER, Mohali	Apr 01-Sep 30, 2019
56	R. Srinivasan	Chennai Mathematical Insitute, Chennai	Feb 25-Mar 07, 2020
57	B. Subhash	IISER, Tirupati	Jul 01-10, 2019
58	K. Sumesh	IIT, Madras	Jun 30-Jul 07, 2019
59	Stefan Tappe	University of Freiburg, Freonirg, Germany	Feb 24-28, 2020
60	Vaibhav Vaish	INSPIRE Faculty Fellow	Jan 04, 2016 -Apr 29, 2019
61	Dootika Vats	IIT, Kanpur	Oct 09-12, 2019

### Stat-Math Unit, Delhi

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Anirvan Chakraborty	IISER, Kolkata	Apr 08-10, 2019
2	Md. Ali Zinna	IISER, Kolkata	Apr 08-10, 2019
3	Issan Patri	CMI, Chennai	Apr 15-17, 2019
4	Ankita Jindal	IIT, Delhi	Apr 29, 2019
5	Manish Mishra	IISER, Pune	May 06-17, 2019
6	Rabeya Basu	IISER, Pune	May 27-31, 2019
7	Pranabesh Das	University of Waterloo, Canada	Jun 03-08, 2019
8	Devendra Prasad	SNU, Greater Noida	Jun 17-July 20, 2019
9	Soutir Bandyopadhyay	Colorado School of Mines, USA	Jun 23-28, 2019
10	Ritabrata Sengupta	IISER, Berhampur	Jun 23-Jul 07, 2019
11	S. Sivasubramanian	IIT, Bombay	Jul 01-09, 2019
12	Debleena Thacker	Department of Mathematics, University of Uppsala, Uppsala, Sweden	Jul 10-19, 2019
13	Satyajit Guin	IIT, Kanpur	Jul 10-20, 2019
14	T. N. Shorey	NIAS Bangalore	Jul 24-Aug 03, 2019
15	Pranabesh Das	University of Waterloo, Canada	Jul 25-30, 2019
16	Nabin Jana	NISER	Aug 01-05, 2019
17	Ali Azimi	University of Neyshabur, Iran	Aug 03-Sep 30, 2019
18	Issan Patri	CMI, Chennai	Aug 11-17, 2019
19	Mohammad Amin Sofi	University of Kashmir	Sep 02-30, 2019
20	Sreedevi. E.P	Department of Statistics SNGS College, Pattambi Palakkad	Sep 22-28, 2019
21	Keshab Bakshi	CMI, Chennai	Oct 21-25, 2019
22	Debraj Das	IIT Kanpur	Oct 25-27, 2019
23	Shakir Ali	Aligarh Muslim University.	Nov 05-07, 2019
24	Ritabrata Sengupta	IISER Burhampur	Nov 07-08, 2019
25	Ankita Jindal	IIT, Delh	Nov 11-23, 2019
26	Jean-Marc Deshouillers	University of Bordeaux, France	Nov 14-17, 2019

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
27	Filip Najman	University of Zagreb, Croatia	Nov 18-22, 2019
28	Sayantan Banerjee	IIM, Indore	Dec 09, 2019
29	Ratndadeep Acharya	RKMVERI, Belur, Kolkata	Dec 11-14, 2019
30	Y. Chaubey	Concordia University	Dec 24-31, 2019
31	Projesh Nath Choudhury	Indian Institute of Science	Dec 28, 2019-Jan 11, 2020
32	Manish Mishra	IISER Pune	Jan 17, 2020
33	Giovanni Landi	Universita di Trieste, Via A. Valerio, Italy	Jan 21-25, 2020
34	Gayathri Varma	National Institute of Technology, Calicut, Kerala	Jan 21-Apr 20, 2020
35	Pierre-Yves Bienvenu	Camille Jordan Institute (ICJ), Lyon, France	Feb 04-05, 2020
36	Ankita Jindal	IIT, Delhi	Feb 04-09, 2020
37	Kaushik Majumdar	IIT, Goa	Feb 07-21, 2020
38	Issan Patri	CMI, Chennai	Feb 11-20, 2020
39	Mohammad Amin Sofi	Kashmir University	Feb 12-28, 2020
40	Gursharn Kaur	National University of Singapore	Feb 16-21, 2020

### Stat-Math Unit, Kolkata

Sr no.	Full Name of Visiting Scientist	Affiliation	Duration
1	Giovanni Landi	University of Trieste, as a part of the ICTP Research in pairs program	Jun 24-Jul 24, 2019
2	Francesco D'Andrea	University of Federico II, Napoli	Oct 22- Nov 01, 2019



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# EVENTS

**114** No. of Programme (Conferences, Symposiums, Workshops, Training Programme) Organised



**No of Lectures:- 304**



**No of Outreach Activities:- 19**

# 7.1 CONVOCATION

## INDIAN STATISTICAL INSTITUTE

The 54th Convocation of the Indian Statistical Institute was held on 23rd January, 2020, at 2:30 P.M. It started with a Vedic Hymn by the ISI Club, followed by a welcome address by Shri Bibek Debroy, President, ISI, annual review by Prof. Sanghamitra Bandyopadhyay, Director, ISI and a Convocation address by Professor Joachim Frank, Nobel Laureate, Columbia University, USA. Shri Tapas Kumar Sanyal, Director General (ES), MoSPI graced the occasion as a Special Guest. Degrees and Diplomas were awarded to students by Shri Bibek Debroy and Prof. Joachim Frank. The Convocation was closed by Shri Bibek Debroy, followed by a vote of thanks by Prof. Goutam Mukherjee, Dean of Studies, ISI and the National Anthem by ISI Club.



Convocation Address by Prof. Joachim Frank, Columbia University, USA



Address by the Director, Prof. Sanghamitra Bandyopadhyay



Felicitating Prof. Joachim Frank, Columbia University, USA



Academic Procession

The outgoing batch of students of all degree and diploma programmes were next felicitated. The meritorious students were awarded their medals and prizes for outstanding performance in the programmes by Shri Bibek Deboy after which the students were individually presented with their degrees and diplomas. Prof. Goutam Mukherjee, Dean of Studies, ISI offered the vote of thanks.



## ISEC Convocation

The 72nd term of the ISEC Regular Course (2018-2019) ended in May 2019. All the 14 trainees were awarded the Statistical Training Diploma at the convocation held on 30th May, 2019. The Convocation Address entitled “National statistics: what is done; and how should it be done” was delivered by Dr. Pronab Sen, former Secretary, Ministry of Statistics and Programme Implementation, former Chief Statistician of India and former Chairman, National Statistical Commission. Mr. Hemendra Kumar Sharma, a representative of the Ministry of External Affairs, attended the Convocation as a Special Guest. In his address to the Trainees, he briefly touched upon the ITEC Program of the Ministry and exhorted the Trainees to be ambassadors of this flagship program. He expressed the hope that there would be greater co-operation between their countries and India in the future.



Dr. Pronab Sen delivering 72nd ISEC Convocation Address



ISEC Training at the Convocation



ISEC Dignitaries at dias during 72nd ISEC Convocation



ISEC trainees with Dignitaries and MEA Representative during 72nd ISEC Convocation

## 7.2 Conference and Symposiums

1. Artificial Intelligence for Business Intelligence, May 07, 2019, at Indian Chamber of Commerce and Industries, Coimbatore [SQC & OR Unit, Coimbatore]
2. National Statistics Day, Jun 28, 2019, at Sankara College Department of Mathematics, Coimbatore [SQC & OR Unit, Coimbatore]
3. Automobiles and HealthCare Analytics Predictive Model, Jul 11-12, 2019, at Department of Statistics, Annamalai University [SQC & OR Unit, Coimbatore]
4. 3<sup>rd</sup> Annual Research Symposium of ISI- Giridih, Jul 16, 2019, at ISI Giridih [AERU & SRU]
5. Stat-Math Symposium by Doctoral and Post-Doctoral Fellows (2019), Aug 22-24, 2019, at ISI Bangalore [SMU, Bangalore]
6. Symposium on Clinical Research Methodology and Medical Writing, "Protocol to Publication Conceptual Understanding of Statistical – 2019", Aug 24-25, 2019, at Taj Venanta, Coimbatore [SQC & OR Unit, Coimbatore]
7. Statistical Techniques in Business Application, Sep 06, 2019, at Jai Shriram Engineering college, Dharapuram [SQC & OR Unit, Coimbatore]
8. Ashok Maitra Memorial Lectures 2019-20, Sep 09, 2019, at ISI Bangalore [SMU, Bangalore]
9. One -day seminar in honour of Professor Satya Ranjan Chakravarty, Sep 16, 2019, at ISI, Kolkata [ERU, Kolkata]
10. 7<sup>th</sup> India Biodiversity Meet, Nov 19-21, 2019, at ISI Kolkata [AERU]
11. KBS Fest - A conference on the occasion of 75th birthday of Professor Kalyan Bidhan Sinha, Dec 12-14, 2019, at ISI Bangalore [SMU, Bangalore]
12. Symposium on Climate Change and Disaster Management in Coastal Areas, Feb 04, 2020, ISI Kolkata [AERU]
13. 4th International Conference on Computational Intelligence and Networks (CINE 2020), Feb 27-29, 2020, at ISI Kolkata [CSCR, Kolkata]



# Workshops

1. Quality and Reliability in Business, May 26, 2019, at Indian Chamber of Commerce and Industries, Coimbatore [SQC & OR Unit, Coimbatore]
2. Sixth Summer School on Computer Vision, Graphics and Image Processing, May 30-Jul 12, 2019, at ISI Kolkata [ECSU, Kolkata]
3. 5th ISI IGC Summer School in Development Economics, Jul 05-09, 2019, at ISI, Delhi [EPU, Delhi]
4. Summer school on Use and Applications of SPSS, Aug 1-5, 2020, at ISI Kolkata [BAU, Kolkata]
5. Geropsychology organized jointly by Psychology Research Unit and Biological Anthropology Unit, Sep 12, 2019, at ISI Kolkata
6. Application of statistical methods in behavioural science with R software, Sep 19-20, 2019, at College of Community Science, AAU, Jorhat [AERU]
7. 8th Delhi Macroeconomics Workshop, Oct 17-18, 2019, at ISI Delhi [EPU, Delhi]
8. Workshop on Statistical Techniques in Research Methodology, Oct 21-24, 2019, at ISI Mumbai Conference Hall [SQC & OR Unit, Mumbai]
9. International Workshop on Advanced Machine Learning Techniques for Climate Informatics, Nov 04-06, 2019, at ISI Kolkata [CSCR, Kolkata]
10. 5th Annual CECFEE Research & Policy Workshop, Nov 10-11, 2019, at Tezpur, Assam [EPU, Delhi]
11. ISI - UTS Joint International Workshop on Machine Learning and its Applications to Pattern Recognition, Nov 14-15, 2019, at ISI Kolkata [CVPRU, Kolkata]
12. Workshop on MoSPI Projects a) Developing an Appropriate Structure Preserving Estimation (SPREE) Method for Estimating Domain-Level Aggregates from NSSO Household Surveys. b) Developing an Appropriate Methodology for Estimating Proportion of Villages with Specific Infrastructure Facility, Nov 21, 2019 at ISI, Kolkata [SOSU, Kolkata]
13. Machine Learning and Mathematical Morphology For Spatial Data Analysis, Nov 21-22, 2019, at Bangalore Section IEEE GRSS Chapter, SSIU, ISI, Bangalore and Dr. Ambedkar Institute of Technology, Bengaluru [SSIU, Bangalore]
14. Design and Analysis of Experiment, Nov 25-30, 2019, at ISI Kolkata [SQC & OR Unit, Kolkata]
15. Six Sigma Green Belt, Dec 03-07, 2019, at ISI Giridih [SQC & OR Unit, Kolkata]
16. N-E Workshop-cum-Training Program on "Statistical Data Analysis using SPSS, R and Julia, Dec 03-07, 2019 at Department of Statistics, Gauhati University [SOSU, Kolkata]
17. IEEE CEDA Winter Symposium on Advanced Formal Techniques Along the Design Flow, Dec 09, 2019, at ISI, Kolkata [ACMU, Kolkata]
18. Data Science in Finance, Dec 18-20, 2019, at Chennai Mathematical Institute [ASU, Bangalore]
19. Workshop on Economic Design, Dec 21-22, 2019, at ISI, Delhi [EPU, Delhi]
20. Workshop on Medical Image Registration (using PyTorch and Neural Networks), Dec 30, 2019, at ISI, Kolkata [ECSU, Kolkata]
21. Winter school on Use and Applications of SPSS, Jan 27-31, 2020, at ISI Kolkata [BAU, Kolkata]
22. Programme on environmental data interpretation, compilation and reporting, Feb 03-07, 2020, SQC&OR, Delhi at Delhi.
23. Workshop on Sensitivity, Query Complexity, Communication Complexity Fourier analysis of Boolean functions, Feb 19-21, 2020, at ISI Kolkata [ACMU, Kolkata]



IEEE CEDA Winter Symposium on Advanced Formal Techniques along the Design Flow December 2019



Inauguration of ISI-UTS joint workshop during November 14-15, 2019



ISI Bangalore, IEEE GRSS DL Talk by Prof. Gustau Camps-Valls

# Training Programmes

Sr. no.	Date	National Training Programmes conducted in 2019-20	Organising Unit	Venue
1	Feb 08-Apr 08, 2019	Six Sigma Green Belt Certification Program (Module-1)	SQC & OR, Mumbai	ISI Mumbai
2	Feb 12-Jul 12, 2019	Certification Program on Six Sigma Green Belt (GB-53)	SQC & OR, Bangalore	SQC & OR Unit, Bangalore
3	Feb 23-Jun 23, 2019	Certification Program on Business Analytics with a focus on Data Science, Machine Learning, Artificial Intelligence	SQC & OR, Hyderabad	ISI, Hyderabad
4	Feb 24-Apr 14, 2019	Training Program on Optimization Tools for Business Analytics	SQC & OR, Hyderabad	ISI, Hyderabad
5	Mar 04-Apr 04, 2019	Training Program on Statistics for Data Science	SQC & OR, Mumbai	L&T Hazira
6	Mar 05-May 05, 2019	Weekend Six Sigma Green Belt Training (Module-2)	SQC & OR, Mumbai	ISI Mumbai
7	Mar 06-Jul 06, 2019	Six Sigma Green Belt and Certification	SQC & OR, Mumbai	CONTROLLER OF NAVAL ARMAMENT INSPECTION
8	Mar 09-Aug 09, 2019	Certification Program on Six Sigma Green Belt (GB-52)	SQC & OR, Bangalore	SQC & OR Unit, Bangalore
9	Apr 01-Sep 15, 2019	Prospective Prediction Model of Fetal Weight and Its Accuracy in Term Birth Weight from Clinical Observation- KG Hospital and post graduate institute	SQC & OR, Coimbatore	ISI, Coimbatore
10	Apr 09-May 09, 2019	Basic Statistics and Capability Analysis using Minitab (Phase-4)	SQC & OR, Mumbai	VERTELLUS SPECIALTY MATERIALS (INDIA) PVT. LTD.
11	Apr 12-Jun 12, 2019	Green Belt Certification Program during (Module-1)	SQC & OR, Mumbai	L&T Mysore
12	Apr 15-16, 2019	Training Program on Statistics	SQC & OR, Mumbai	Ernst & Young LLP, Mumbai
13	Apr 22-27, 2019	Six Sigma Master Black Belt Certification Programme (Module-1)	SQC & OR, Mumbai	ISI Mumbai
14	Apr 27-28, 2019	Weekend Six Sigma Green Belt Training (Module-1)	SQC & OR, Mumbai	ISI Mumbai
15	Apr 30-Mar 05, 2019	Advance Statistics for Process Improvement (Module-1)	SQC & OR, Mumbai	ISI Mumbai
16	May 08-26, 2019	Foundation course on Business Analytics using R (BA-07)	SQC & OR, Bangalore	SQC & OR Unit, Bangalore
17	May 08-Sep 21, 2019	Certification Program on Six Sigma Black Belt (BB-31)	SQC & OR, Bangalore	SQC & OR Unit, Bangalore
18	May 08-Jul 08, 2019	Six Sigma Green Belt Certification Program (Module-1)	SQC & OR, Mumbai	L & T - MADH
19	May 9, 2019	Workshop on FMEA	SQC & OR, Mumbai	GIA Ltd
20	May 13-Jul 05, 2019	Internship training on "Improving The Efficiency Of a Steam Boiler Using Bio Mass Waste as Fuel" and "Using Failure Mode and Effects Analysis to Assess the risk Involved and Provide a skill matrix" - Department of Biotechnology, Indian Institute of Technology, Madras	SQC & OR, Coimbatore	ISI, Coimbatore

Sr. no.	Date	National Training Programmes conducted in 2019-20	Organising Unit	Venue
21	May 15-Jul 15, 2019	Internship training on Quality Management system at FCRI on Risk and Opportunities on flow measurement - Department of Metallurgical and Materials Engineering National Institute of Technology, Tiruchirapalli,	SQC & OR, Coimbatore	ISI, Coimbatore
22	May 16-17, 2019	Workshop on Design of Experiments (Module-1)	SQC & OR, Mumbai	HILTI MANUFACTURING INDIA PVT. LTD., Navsari, Gujrat
23	May 20-25, 2019	Six Sigma Master Black Belt Certification Programme (Module-2)	SQC & OR, Mumbai	ISI Mumbai
25	Jun 01-Sep 06, 2019	Certification Program on Six Sigma Green Belt (GB-51)	SQC & OR, Bangalore	SQC & OR Unit, Bangalore
26	Jun 12-Aug 12, 2019	Certification Program on Business Analytics and Data Mining (Mod-3)	SQC & OR, Mumbai	ISI Mumbai
27	Jun 14-15, 2019	Workshop on Six Sigma	SQC & OR, Mumbai	ABM KNOWLEDGEWARE LIMITED, MUMBAI
28	Jun 17-19, 2019	Advance Statistics for Process Improvement (Module-2)	SQC & OR, Mumbai	ISI Mumbai
29	June 18, 2019	TVS, Brakes India "Sensors and Artificial Intelligence for Predicting Brake pad Wear in Car" The R & D department of leading Brakes Manufacturers decided to predict the wear of break pads	SQC & OR, Coimbatore	TVS, Brakes India, Chennai
30	Jun 20-Oct 08, 2019	Internship Training on "Prescriptive prediction of three-dimensional Measurements of Aerospace component Reducing cost and time on Testing and Inspection" and Strategy for optimum purchase for "On time Delivery" of Aerospace Imported Components - Georgia state university Atlanta	SQC & OR, Coimbatore	ISI, Coimbatore
31	Jun 20-21, 2019	Basic Statistics and Capability Analysis using Minitab (Phase-2)	SQC & OR, Mumbai	VERTELLUS SPECIALTY MATERIALS (INDIA) PVT. LTD.
32	Jun 25-27, 2019	Training Program on Statistical Techniques for Business Forecasting	SQC & OR, Mumbai	ISI Mumbai
34	Jul 17-20, 2019	Program on Problem solving using Design of Experiments (DoE-06)	SQC & OR, Bangalore	SQC & OR Unit, Bangalore
35	Jul 18-19, 2019	Workshop on Design of Experiments (Module-2)	SQC & OR, Mumbai	HILTI MANUFACTURING INDIA PVT. LTD.
36	Jul 24-25, 2019	SPC Training Program	SQC & OR, Mumbai	GRASIM INDUSTRIES LIMITED
37	Aug 08-Sep 08, 2019	Training on " Statistical Tools"	SQC & OR, Mumbai	HINDUSTAN UNILEVER LTD
38	Aug 11-Oct 11, 2019	Certification Program on Business Analytics and Data Mining (Mod-1)	SQC & OR, Mumbai	ISI Mumbai
39	Aug 21-Aug 22, 2019	Basic Statistics and Capability Analysis using Minitab (Phase-3)	SQC & OR, Mumbai	VERTELLUS SPECIALTY MATERIALS (INDIA) PVT. LTD.
40	Aug 26-30, 2019	Six Sigma Black Belt Certification Programme during (Module-1)	SQC & OR, Mumbai	ISI Mumbai
41	Aug 27-29, 2019	Six Sigma Green Belt Certification Program (Module-1)	SQC & OR, Mumbai	Kalpataru Power Transmission Ltd, Ahmedabad
42	Aug 28-31, 2019	Foundation course on Business Forecasting using R (BF-05)	SQC & OR, Bangalore	SQC & OR Unit, Bangalore
43	Sep 12-Oct 12, 2019	Workshop on "Statistics for Data Science for GET's"	SQC & OR, Mumbai	L&T Corporate HR, Hazira

Sr. no.	Date	National Training Programmes conducted in 2019-20	Organising Unit	Venue
44	Sep 18-20, 2019	Six Sigma Green Belt Certification Program (Module-2)	SQC & OR, Mumbai	L & T - MADH
45	Sep 23-27, 2019	Six Sigma Black Belt Certification Programme during (Module-2)	SQC & OR, Mumbai	ISI Mumbai
46	Sep 30-Jan 10, 2019	SPC for Quality Improvement	SQC & OR, Mumbai	Ordnance Factory, Vrangoan
47	Oct 08-Nov 08, 2019	Six Sigma Green Belt Certification Program (Module-2)	SQC & OR, Mumbai	ISI Mumbai
48	Oct 12-Dec 14, 2019	Training program on "Sigma Sigma Green Belt" Hyderabad	SQC & OR, Hyderabad	ISI, Hyderabad
49	Oct 14-15, 2019	Six Sigma Green Belt Certification Program (Module-2)	SQC & OR, Mumbai	Kalpataru Power Transmission Ltd, Ahmedabad
50	Oct 15-18, 2019	Six Sigma Black Belt Certification Programme during (Module-3)	SQC & OR, Mumbai	ISI Mumbai
51	Oct 18-19, 2019	SPC for Quality Improvement	SQC & OR, Mumbai	Ordnance Factory, Pune
52	October 23, 2019	Training and Implementation of Sampling Plan	SQC & OR, Mumbai	TAL MANUFACTURING SOLUTIONS LTD.
53	Oct 31-Nov 16, 2019	Training program on "Business Analytics using R ", Hyderabad.	SQC & OR, Hyderabad	ISI, Hyderabad
54	Nov 06-Dec 06, 2019	Basic Statistics and Capability Analysis using Minitab (Phase-I)	SQC & OR, Mumbai	VERTELLUS SPECIALTY MATERIALS (INDIA) PVT. LTD.
55	Nov 08-Aug 25, 2019	Certification Program on Six Sigma Master Black Belt (MBB-3I)	SQC & OR, Bangalore	SQC & OR Unit, Bangalore
56	Nov 09-Dec 09, 2019	FEMA Project Review	SQC & OR, Mumbai	L&T Powai
57	Nov 19-20, 2019	Workshop on "Statistics for Data Science for GET's"	SQC & OR, Mumbai	L&T Corporate HR, Vadodara
58	Nov 22-24, 2019	Certification Program on Business Analytics and Data Mining (Mod-2)	SQC & OR, Mumbai	ISI Mumbai
59	Nov 25-26, 2019	Workshop on "Statistics for Data Science for GET's"	SQC & OR, Mumbai	L&T Corporate HR, Chennai
60	Nov 25-29, 2019	Official Statistics for Officials from Directorate of Economics and Statistics, Govt. of Assam	AOSU, Tezpur	ISI, NE Cente
61	Nov 27-30, 2019	Foundation course on Predictive Modeling using Python (PM-05)	SQC & OR, Bangalore	SQC & OR Unit, Bangalore
62	Dec 13-15, 2019	Six Sigma Green Belt Certification Program (Module-1)	SQC & OR, Mumbai	ISI Mumbai
63	Dec 16-17, 2019	Six Sigma Green Belt Certification Program (Module-3)	SQC & OR, Mumbai	Kalpataru Power Transmission Ltd, Ahmedabad
64	Dec 20-22, 2019	Certification Program on Business Analytics and Data Mining (Mod-4)	SQC & OR, Mumbai	ISI Mumbai
65	Dec 21-22, 2019	Six Sigma Green Belt Certification Program (Module-2)	SQC & OR, Mumbai	ISI Mumbai
66	Feb 21-23, 2020	Statistical Techniques for Business Forecasting	SQC & OR, Mumbai	ISI Mumbai
67	Feb 25-26, 2020	SPC for Quality Improvement	SQC & OR, Mumbai	Ordnance Factory, Katni, MP
68	Mar 01-Apr 01, 2020	SPC for Quality Improvement	SQC & OR, Mumbai	Ordnance Factory, Ambarnath

Sr. no.	Date	National Training Programmes conducted in 2019-20	Organising Unit	Venue
69	Mar 02-Jul 03, 2020	Certification Program on Six Sigma Black Belt (BB-32)	SQC & OR, Bangalore	SQC & OR Unit, Bangalore
70	Apr 03-Jun 03, 2020	Workshop on FMEA(2019 Version)	SQC & OR, Mumbai	L&T-(Electrical & Automation)-Powai
71	May 02-Jul 02, 2020	Green Belt Certification Program during (Module-2)	SQC & OR, Mumbai	L&T Mysore
72	Oct 01-Dec 01, 2020	Certification Program on Business Analytics and Data Mining (Mod-5)	SQC & OR, Mumbai	ISI Mumbai
73	Oct 02-Feb 15, 2020	Foundation course on Machine Learning using Python (ML-01)	SQC & OR, Bangalore	SQC & OR Unit, Bangalore
74	Oct 02-Nov 02, 2020	Statistical Analysis Program	SQC & OR, Mumbai	GRASIM INDUSTRIES LIMITED - Pulp & Fibre Innovation Centre
75	Nov 01-Jan 25, 2020	Certification Program on Six Sigma Master Black Belt (MBB-32)	SQC & OR, Bangalore	SQC & OR Unit, Bangalore
76	Nov 20-Jan 24, 2020	Training Programme on 'NATIONAL SAMPLE SURVEYS' for Government Officials of the North-Eastern States	AOSU, Tezpur	ISI North-East Centre

Sr. no.	Date	International Training Programmes conducted in 2019-20	Organising Unit	Venue
1	Sep 01-07, 2019	SURVEY METHODOLOGY AND DATA ANA+C78LYTICS for Probationers of Indian Statistical Service (40th Batch), NSSTA, MOS&PI, Govt. of India	SOSU, Kolkata	OLC at Statistics, Netherlands
2	Feb 10-11, 2020	CALDAM Indo-French Pre-Conference School on Algorithms and Combinatorics	ACMU, Kolkata	IIT, Hyderabad



Training Programme on 'NATIONAL SAMPLE SURVEYS' for Government Officials of the North-Eastern States during January 20-24, 2020.



Trg Prg on Official Statistics for Officials from Directorate of Economics and Statistics, Govt. of Assam during Nov.25-29, 2019

## 7.3 Lectures

### Applied Statistics Division (ASD)

#### ASU, Kolkata

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Apr 02, 2019	Tests for high- dimensional linear hypotheses through spectral shrinkage	Debasish Paul	University of California ,USA
2	May 28, 2019	Current Status Data with Competing Risks and Missing Failure Types	Tamalika Koley	Indian Statistical Institute, Kolkata
3	Jul 16, 2019	A Statistical Analysis of Crowd Sourced Mobile Data	S.N.Lahiri	North Carolina State University Raleigh, NC, USA
4	Aug 20, 2019	Bayesian inference in Non parnormal graphical models	Subhashish Ghosal	North Carolina State University Raleigh, NC, USA
5	Sept 03, 2019	Is ISI running out of Statistics	Gopal K. Basak & Debasis Sengupta	Indian Statistical Institute, Kolkata
6	Sept 24, 2019	On Certain Probabilistic and Inferential Issues in Nonparametric Ageing Models	Shyamal Ghosh	Indian Institute of Engineering Science and Technology, Shibpur
7	Oct 01, 2019	Provable Security of Symmetric- Key Cryptographic Schemes	Ashwin Jha	Delhi
8	Nov 26, 2019	Bayesian Regularization for Gaussian Graphical Models	Ashwin Jha	Delhi
9	Jan 28, 2020	Inference and interpretability in latent variable modeling	Aritra Guha	University of Michigan Ann Arbor, MI,USA
10	Feb 04, 2020	Estimating the Optimal Linear Combination of Biomarkers using Spherically Constrained Optimization	Priyam Das	Harvard Medical School Boston, MA, USA

#### ISRU, Kolkata

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Jun 07, 2019	A Bayesian Integrated graphical model framework for Personalized Network estimation in Cancer	Sayantana Banerjee	Indian Institute of Management Indore, India
2	Jun 18, 2019	On inference in Observational Studies	Rajarshi Mukherjee	Department of Biostatistics, Harvard T.H. Chan School of Public Health, Harvard University, USA
3	Aug 29, 2019	High Dimensional CLT: Improvements, Non-Uniform Extensions and Large Deviations	Somabha Mukherjee	Department of Statistics, Wharton Business Schol, University of Pennsylvania, Philadelphia, USA
4	Dec 19, 2019	Time-dependent Prediction Accuracy to Assess Survival Models in the presence of Competing Risks	Paramita Saha Chaudhuri	Department of Epidemiology, Biostatistics & Occupational Health, McGill University, USA
5	Jan 16, 2020	Model misspecification and EM convergence	Koulik Khamaru	Department of Statistics, University of California, Berkeley CA, USA

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
7	Feb 04, 2020	Matrix Visualization for Big Data (For students)	Chun-Houh Chen	Institute of Statistical Sciences, Academia Sinica, Taipei, Taiwan
6	Feb 05, 2020	Matrix Visualization for Big Data (For students)	Chun-Houh Chen	Institute of Statistical Sciences, Academia Sinica, Taipei, Taiwan
7	Februart 06, 2020	Matrix Visualization for Big Data	Chun-Houh Chen	Institute of Statistical Sciences, Academia Sinica, Taipei, Taiwan
8	Feb 07, 2020	Optimality of Plans Orthogonal Through the Block Factor	Sunanda Bagchi	Indian Statistical Institute, Bangalore
9	Mar 05, 2020	A semiparametric Bayesian model for spatiotemporal extremes	Arnab Hazra	King Abdullah University of Science and Technology, Thuwal, Saudi Arabia



## Biological Sciences Division (BSD)

### HGU, Kolkata

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Apr 12, 2019	Bayesian clustering of skewed and multimodal distributions with applications to genomics	Mayetri Gupta	Glasgow University, Glasgow, Scotland
2	Jul 01, 2019	Some contributions to the estimation of genomic distances between populations	Tristan Mary-Huard	AgroParisTech, INRA, Paris
3	Jul 05, 2019	Tree-based mixtures with applications in ecology and epidemiology	Stephane Robin	AgroParisTech / INRA / University, Paris-Saclay
4	Dec 16, 2019	Knockoff genotypes: value in counterfeit	Chiara Sabatti	Stanford University, USA



## Computer and Communication Sciences Division (CCSD)

### ACMU, Kolkata

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Apr 16, 2019	An Invitation to Communication Complexity	Arkadev Chattopadhyay	TIFR Mumbai
2	Apr 18, 2019	The Log-Approximate-Rank Conjecture is False	Arkadev Chattopadhyay	TIFR Mumbai
3	Apr 26, 2019	Deterministic Leader Election in Programmable Matter	William K. Moses Jr.	Technion, Haifa, Israel
4	Apr 29 to May 03, 2019	Parameterized Complexity	Saket Saurabh	Institute of Mathematical Sciences (IMSC)
5	May 27, 2019	A Formal Approach to Intervention-based Data Analysis	Sudipa Roy	Duke University, USA
6	May 28, 2019	Random Contractions in Hypergraph Connectivity	Debmalya Panigrahi	Duke University, USA
7	May 30, 2019	Incremental and Parallel Algorithms for Dense Subgraph Detection	Apurba Das	Research Fellow, National University of Singapore
8	Jun 10, 2019	Curious Case of Local Decoding Against Computationally Bounded Channel	Rishiraj Bhattacharyya	the School of Computer Science in NISER, Bhubaneswar

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
9	Jun 21, 2019	Data-Driven Resiliency Solutions for Integrated Circuits and Systems	Krishnendu Chakrabarty	Duke University, USA
10	Jul 03, 2019	Approximation Schemes for Geometric Coverage Problems	Minati De	IIT Delhi
11	Jul 24, 2019	Hybrid On-Chip Communication for Heterogeneous many-Core Architectures	Partha Pratim Pande	Washington State University
12	Jul 31, 2019	Some Results on the Second Neighborhood	Francis C. Mathew	Computer Science ISI, Chennai
13	Sept 12, 2019	Learning and Testing Casual Models with Interventions	Arnab Bhattacharyya	the School of Computing, National University of Singapore
14	Oct 25, 2019	On Decision Tree Complexity of Boolean Functions	Swagato Sanyal	Department of Computer Science and Engineering, IIT Kharagpur
15	Nov 06, 2019	Improved Bounds on Fourier Entropy and Min-entropy	Nitin Saurabh	Max-Planck Institute, Saarbrucken
16	Nov 27, 2019	Online Sequential Learning-based Machine Learning Framework for Low-Power Industrial IoT	Bapi Kar	The School of EEE, Nanyang Technological University, Singapore
17	Dec 09, 2019	Advanced Formal Techniques along the Design Flow	Rolf Drechsler	University of Bremen/DFKI, Germany
18	Dec 10, 2019	Conflict free Colouring and its variants in graphs and Hypergraphs	Ashok Pradeesha	Faculty, IIT Bengaluru
19	Dec 24, 2019	Streaming Verification of Graph Computations via Graph Structure	Prantar Ghosh	Dartmouth University
20	Dec 19, 2019	Falsification of hybrid systems using symbolic reachability and trajectory splicing.	Amit Gurung	Martin Luther Christian University, Shillong Meghalaya
21	Jan 03, 2020	Testing Noisy Linear Equations for Sparsity	Anindya De	University of Pennsylvania
22	Jan 07, 2020	Kernelization of Cycle Packing with Relaxed Disjointness Constraints	Diptapriyo Majumdar	Royal Holloway, University of London
23	Jan 06, 2020	Sending and Forgetting: Amnesiac Flooding on a Graph	Amitabh Trehan	Loughborough University
24	Jan 08, 2020	Algorithmic Foundations of Programmable Matter	Richa Andrea	Arizona State University, USA
25	Jan 10, 2020	Testing Noisy Linear Equations for Sparsity	Debsoumya Chakraborti	Carnegie Mellon University, Pittsburg, USA
26	Jan 14, 2020	Roots of polynomials modulo prime power	Rajat Mittal	IIT Kanpur
27	Jan 27, 2020	Weighted min-cut: Sequential, cut-query and streaming algorithms	Sagnik Mukhopadhyay	KTH Royal Institute of Technology, Sweden
28	Feb 05, 2020	Sensitivity lower bounds from linear dependencies	Reza Naserasr	IRIF, Université Paris-Diderot
29	Feb 13, 2020	How to experiment without losing trust	Arnab Sinha	Amazon USA
30	Feb 19, 2020	Improved upper bounds on Fourier entropy	Nitin Saurabh	Max-Planck Institute, Saarbrucken
31	Feb 19, 2020	AND testing	Yuval Filmus	Technion, Israel Institute of Technology, Israel
32	Feb 19, 2020	High Dimensional Expanders: Introduction and some recent	Prahladh Harsha	TIFR Mumbai
33	Feb 19, 2020	Sensitivity lower bounds from linear dependencies	Anupa Sunny	IRIF, Université de Paris
34	Feb 20, 2020	Exact degree of a symmetric Boolean function	Rajat Mittal	IIT Kanpur
35	Feb 20, 2020	Equality Alone Does Not Simulate Randomness	Arkadev Chattopadhyay	TIFR Mumbai

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
36	Feb 20, 2020	Partition Bound Is Quadratically Tight for Product Distributions	Rahul Jain	National University of Singapore
37	Feb 20, 2020	Refuting the Log-Approximate-Rank Conjecture	Suhail Sherif	TIFR Mumbai
38	Feb 21, 2020	Hardness of approximating hypergraph coloring	Ameey Bhangale	University of California, Riverside
39	Feb 21, 2020	On decision tree complexity of Boolean functions	Swagato Sanyal	IIT Kharagpur, India
40	Feb 21, 2020	New approaches for proving lower bounds on the length of locally decodable codes	Arnab Bhattacharyya	National University of Singapore
41	Feb 21, 2020	Hardness of Approximation of (Multi-)LCS over Small Alphabet	Diptarka Chakraborty	National University of Singapore
42	Feb 24, 2020	Efficient Distance Approximation for Structured High-Dimensional Distributions via Learning	Sutanu Gayen	National University of Singapore
43	Mar 11, 2020	Predictive Analytics in Machine Learning	Rajiv V. Joshi	IBM T.J. Watson Research Center, New York

### CVPRU, Kolkata

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Jan 07, 2020	Lung Abnormality Detection: Assessing Diagnostic or Screening Tests?	K. C. Santosh	Department of Computer Science, University of South Dakota (USD), USA
2	Dec 06, 2019	AI/ML in Digital Forensics	Katrin Franke	Norwegian University of Science and Technology, Norway.

### ECSU, Kolkata

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Jul 01, 2019	Optimal Scheduling Algorithms for Minimizing the Age-of-Information for the Multi-User Erasure Channel	Abhishek Sinha	Dept. of Electrical Engineering, Indian Institute of Technology Madras
2	Aug 26, 2019	DeepInsight - An examination of the class decision functions learned by deep nets	Saumya Jetley	Oxford University, UK
3	Oct 24, 2019	A novel estimation of mutual information	Kaushik Majumdar	Indian Statistical Unit, Bangalore
4	Nov 04, 2019	Generalized Statistical Object Distance Analysis (GSODA) For Object Based Colocalization In Quantitative Microscopy	Suvadip Mukherjee	Institut Pasteur, Bioimage Analysis Unit, Paris
5	Dec 27, 2019	An Overview of Adversarial Training Techniques for Countering Adversarial Attacks in Machine Learning	Prithviraj Dasgupta	U.S. Naval Research Laboratory, Washington D.C.
6	Jan 03, 2020	Osteoporosis, Bone Microarchitecture, and Imaging – Recent Developments and Translational Studies	Punam K Saha	University of Iowa, IA 52242
7	Jan 08, 2020	Deep Learning for Curvilinear Vascular Structure Segmentation	Kannappan Palaniappan	University of Missouri-Columbia
8	Jan 28, 2020	Efficient utilization of data in designing computer vision solutions	Anirban Chakraborty	Indian Institute of Science, Bangalore
9	Jan 31, 2020	Forensic science: A machine learning perspective	Rajesh Kumar	Institute of Forensic Science, Aurangabad, MS, INDIA
10	Feb 12, 2020	Distribution Generation Power of Neural Networks: A Separation Result	Manuj Mukherjee	Telecom Paris, Paris, France


**Physics and Earth Sciences Division (PESD)**
**GSU, Kolkata**

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Apr 23, 2019	Identifying Scale-dependent Changes in Data and other Applications of Lacunarity	Ankur Roy	IIT, KGP
2	Jul 12, 2019	Environmental Geomorphology and geomorphological hazards with special reference to land slides in Darjeeling Himalayas.	Sunil Kumar De	Department of Geography, North Eastern Hilly University
3	Jul 16, 2019	Tail clubs of a sauropod dinosaur from the Kota Formation, India	Tariq Abdul Kareem	Research Scholar, University of Michigan, USA
4	Nov 05, 2019	South American Triassic vertebrates	Sergio de Silva	Santa Maria University, Brasil
5	Nov 06, 2019	Gondwana vertebrates and South America	Sergio de Silva	Santa Maria University, Brasil
6	Dec 23, 2019	How Fault Shift Gears - Himalaya to Aluetien	Avijit Ghosh	University of California Riverside
7	Jan 20, 2020	Timing of Purana successions in southern India: perspectives from palaeomagnetism	Michiel De Cock	Department of Geology, University of Johannesburg, SA
8	Feb 02, 2020	How Did Photosynthesis Evolve?	Dawn Yvonne Sumner	University of California, Davis, USA
9	Feb 02, 2020	Extending our Understanding of Early Diagenetic Chert	Linda christine Kah	Department of Earth and Planetary Sciences, University of Tennessee, USA
10	Jan 21, 2020	Shallow marine sedimentary systems of East Slovakian Neogene Basin	Juraj Janočko	Vice-Dean, Faculty of Mining, Ecology, Process Control and Geotechnologies, Technical University of Kosice, Slovakia

**PAMU, Kolkata**

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	May 01, 2019	Higher curvature correction in Einstein Hilbert action and gravitational collapse.	Soumya Chakraborty	Indian Institute Technology, Kharagpur
2	May 10, 2019	Portrait of a dark face.	Tapas K. Das	Harish Chandra Research Institute, Allahabad
3	May 28, 2019	Open quantum theory of two entangled atoms in De sitter universe	Sayantana Choudhury	Max Planck Institute for Gravitational
4	May 29, 2019	Age-structured and delay differential- difference model of hematopoietic stem cell dynamics	Mostafa Adimy	INRIA Lyon, France
5	Jul 09, 2019	Hall Effect on tilted Type-I and Type-II Weyl semimetal	Anirban Kundu	National University of Singapore, Singapore
6	Jul 19, 2019	Incoherent operations: structure and applications.	Swapan Rana	University of Warsaw, Poland
7	Sep 20, 2019	Application of dynamical system technique in f(R) cosmology	Saikat Chakraborty	Indian Institute Technology, Kanpur
8	Sep 27, 2019	Controlled light-matter interactions : implications in quantum information processing	Debabrata Goswami	Indian Institute Technology, Kanpur


**Social Sciences Division (SSD)**
**ERU, Kolkata**

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Jul 11, 2019	Political Alignment and Economic Outcomes: Revisited	Sourav Sarkar	Department of Economics, Ahmedabad University
2	Jul 25, 2019	Overconfident Boards, CEO Compensation and Turnove	Jaideep Chowdhury	James Madison University
3	Aug 07, 2019	Early Warning Signs: Targeting Neonatal and Infant Mortality Using Statistical Learning	Dweepobotee Brahma	Brookings Institute, India Branch
4	Aug 14, 2019	Leadership Development and Financial Inclusion: The Bangladesh Experience.	Atiur Rahman, Ex-Governor	Central Bank of Bangladesh, Department of Development Studies, Dhaka University, Bangladesh
5	Sept 16, 2019	Multidimensional Gini Indices Revisited	Asis Banerjee, Ex. Professor	Department of Economics, Calcutta University
6	Sept 16, 2019	Measuring Welfare Change	Bhaskar, Dutta	Department of Economics, Ashoka University, New Delhi
7	Sept 16, 2019	Needs and Capabilities in Measuring and Targeting Multi-Dimensional Poverty.	Pronab Sen	IGC
8	Sept 16, 2019	Poverty, Inequality and Mobility in India: Insights from Longitudinal Data	Himanshu	Department of Economics, Jawaharlal Nehru University, New Delhi
9	Sept 16, 2019	Iniequal Inequalities in India During the Rapid Growth Process	Achin Chakraborty	Institute of Development Studies, Kolkata
10	Sept 25, 2019	Measuring Economic Mobility in India Using Noisy Data: A Partial Identification Approach.	Punarjit Roychowdhury	Indian Institute of Management, Indore, Madhya Pradesh
11	Oct 16, 2019	Shadow Education, Intra-household Resource Allocation and Educational Achievements in India	Tanmoy Majilla	Erasmus University
12	Dec 26, 2019	Reputation and Strategic Choices in Business Schools: The Role of Rankings and Accreditations.	Aurobindo Ghosh	Singapore Management University, Singapore
13	Jan 06, 2020	Rules, Resolutions, Randomness and Reward: Lessons from a Game	Jyotirmoy Sarkar	Indiana University-Purdue University Indianapolis, USA
14	Jan 07, 2020	How Do We Measure the Relative Strength of the Dominant Partner among Married Couple?	T.E.S. Raghavan	Department of Economics, University of Illinois, Chicago, USA
15	Jan 15, 2020	The Glasses Are Tinted: Self Confidence and Poverty Traps.	Anuradha Saha	Department of Economics, Ashoka University, Haryana
16	Jan 29, 2020	Born this Way? Prenatal Exposure to Testosterone May Determine Behavior in Competition and Conflict	Subhasish M. Chowdhury	Department of Economics, University of Bath, United Kingdom
17	Feb 12, 2020	Inequality of Opportunity in Indian, Society	Tista Kundu	Centre de Sciences Humaines, New Delhi
18	Feb 18, 2020	Losers Buy Beta	Koustav De	Gatton College of Business & Economics, University of Kentucky, Lexington, KY 40506
19	Feb 19, 2020	Property Rights, Technological Innovation and Economic Growth: A Cross Country Analysis.	Siddhartha Chattopadhyay	Humanities and Social Sciences, Indian Institute of Technology, Kharagpur, West Bengal

## EPU, Delhi

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Apr 12, 2019	How do households finance private school education? Insights from NSSO data	Bharti Nandwani	Indira Gandhi Institute of Development Research
2	Apr 26, 2019	Inequality, corruption and cooperation: Evidence from Vietnam	Saurabh Singhal	Lancaster University
3	Apr 30, 2019	Are Transparency and Accountability Enough? Open Corruption and Why it Exists	Ajay Shenoy	University of California, Santa Cruz
4	May 03, 2019	FDI and International Collusion	Uday Bhanu Sinha	Delhi School of Economics
5	May 21, 2019	Our Distrust is Very Expensive	Rahul Deb	University of Toronto
6	Jun 05, 2019	Repeated Coordination with Private Learning	Kalyan Chatterjee	Penn State University
7	Jun 20, 2019	Still Waters Run Deep: Groundwater Arsenic Contamination & Education Outcomes in India	Rashmi Barua	Jawaharlal Nehru University
8	Jul 15, 2019	Incentivizing Effort in Peer Grading	Anujit Chakraborty	UC Davis
9	Jul 24, 2019	The long run effects of monetary policy	Sanjay Singh	UC Davis
10	Aug 01, 2019	The Myths of Official Measurement: Auditing and Improving Education Data in Developing Countries	Abhijeet Singh	Stockholm School of Economics
11	Aug 07, 2019	Corruption and stock price volatility: Firm-level evidence	Chandan Kumar Jha	Le Moyne College, USA
12	Aug 08, 2019	Does Inflation Targeting Anchor Inflation Expectations? Evidence from India	Shekhar Tomar	ISB, Hyderabad
13	Aug 09, 2019	Overconfident Directors, CEO compensation and turnover.	Jaideep Chowdhury	James Madison University, USA
14	Aug 22, 2019	Absenteeism, Productivity, and Relational Contracting Inside the Firm	Achyuta Adhvaryu	University of Michigan
15	Aug 23, 2019	Transfers in Non-cooperative Games	Pradeep Dubey	SUNY Stony Brook and Yale
16	Aug 30, 2019	Sequential learning with predecessor choice	Anirban Kar	Delhi School of Economics
17	Sept 13, 2019	Game of hide and seek in networks	Bhaskar Dutta	Ashoka University and University of Warwick
18	Sept 25, 2019	Migrants and Firms: Evidence from China	Clément Imbert	University of Warwick
19	Sept 27, 2019	Women's labor force participation and household technology adoption	Tarun Jain	IIM Ahmedabad
20	Oct 04, 2019	Winning Coalitions in Plurality Voting Democracies	Dinko Dimitrov	Saarland University, Germany
21	Oct 09, 2019	Do Women Get Worse Financial Advice? Answers from an Audit Study	Sujata Visaria	Hong Kong University of Science and Technology
22	Oct 11, 2019	The Role of Regulatory Interventions to Aid Bankruptcy Reforms in the Presence of Under-capitalized Banks	Subrata Kumar Ritadhi	RBI
23	Oct 18, 2019	Inefficient water pricing and incentives for conservation	Ujjayant Chakravorty	Tufts University
24	Oct 25, 2019	Strategy of Conquest	Marcin Dziubinski	University of Warsaw
25	Nov 01, 2019	Real-Time Pricing on Two-Sided Platforms	Sneha Bakshi	
26	Nov 13, 2019	The Turn-of-the-Year Effect before Income Taxes or Modern Institutional Investors	Vikas Mehrotra	Alberta School of Business, University of Alberta
27	Jan 08, 2020	Testing	Eric Hanushek	Stanford University
28	Jan 10, 2020	When firms matter: Propagation of firm-level shocks through production networks	Girish Bahal	University of Western Australia
29	Jan 24, 2020	Equity Pricing New Keynesian Models with Nominal Rigidities and Investment	Rahul Nath	Ashoka University

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
30	Jan 31, 2020	Targeting Neonatal and Infant Mortality using Machine Learning	Dweepobotee Brahma	Brookings Institution India Center
31	Feb 20, 2020	Domestic violence and male unemployment-evidence from mass layoffs	Sonia Bhalotra	University of Essex

### PSU, Kolkata

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Nov 13, to Nov 19, 2019	Some Ideas and Concepts on Adult and Old Age Mortality under the Generalised Population Model	Subrata Lahiri	Independent Researcher and ex-Professor and Officiating Director of International Institute for Population Sciences, Mumbai, India

### PRU, Kolkata

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Aug 23, 2019	Categorical regression with Dummy Dependent Variables	Manoranjan Pal	Retired Professor, ERU, ISI, Kolkata
2	Aug 16, 2019	Measurement in Psychological counselling	Rama Mann	Department of Guidance and counselling, Indian Institute of Psychometry, Kolkata.
3	Aug 16, 2019	Psychological scales and scaling	Rita Karmakar,	Assistant professor, Amity Institute of Psychology and Allied Sciences. Amity University Kolkata.
4	Jan 15, 2020	Significance of MMPI-2RF & Scoring Procedure	K.S. Sengar,	Additional Professor, Department of Clinical Psychology, Ranchi Institute of Neuropsychiatry & Allied Sciences (RINPAS), Kanke.
5	Jan 15, 2020	Critical Aspects of MMPI 2 RF	Susmita Halder	Associate Professor, Clinical Psychology, Amity Institute of Behavioural Health & Allied Sciences, Amity
6	Jan 17, 2020	Efficacy of MMPI 2 RF in Psychiatric diagnosis, limitations, critique and counter critique	Sreetama Chatterjee	Clinical Psychologist, Institute of Psychiatry, Centre of Excellence
7	Aug 23, 2019	Categorical regression with Dummy Explanatory Variables	Monoranjan Pal	Adamas University, Kolkata
8	Nov 22, 2019	Item analysis - Item difficulty, Item discrimination	Atanu Kumar Dogra	Dept. of Psychology, University of Kolkata
9	Nov 22, 2019	Item shortening, Item validity	Sumona Datta	Adamas University, Kolkata
10	Sept 12, 2019	Geropsychology for Care Giver	Sahely Ganguly	C.C.P., AMRI Hospital, Dhakuria
11	Sept 12, 2019	Well-being and Quality of Life in the Age of Dementia	Nilanjana Maulik	Secretary and National Coordinator Working Group ARDSI

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
12	Sept 12, 2019	Amma and Alzheimer's	Nishi Pulugurtha	Dept. of English, BKC College, Kolkata
13	Sept 12, 2019	Neuropsychology in the Differential Diagnosis of Dementia and its Challenges in the Indian Context	Aparna Dutta	Consultant Neuropsychology & Clinical Psychology Unit, Duttanagar Mental Health Centre



## Statistical Quality Control & Operations Research Division

### SQC & OR Unit, Bangalore

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Jan 08, 2020	A comparison of robust multivariate control chart for individual observations	Asokan Mulayath Variyath	Memorial University of Newfoundland, Canada

### SQC & OR Unit, Kolkata

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Jun 24, 2019	Implementation of compound optimal design strategy in censored life-testing experiment	Ritwik Bhattacharya	Research Professor, Tecnológico de Monterrey, México
2	Jul 18, 2019	Importance of Fixed Point Theorems in Economics and Game Theory	Deepmala	Indian Institute of Information Technology,
3	Jul 22, 2019	A Structured Approach for Analytics Execution and Measuring Analytics Quality	Rajesh Jugulum	Northeastern University, Boston
4	Sept 25, 2019	Tampered Random Variable Modelling for Multiple Step-stress Life Test	Farha Sultana	Visiting Scientist, ASU



## Theoretical Statistics and Mathematics Division

### SMU, Bangalore

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Apr 10, 2019	Towards a categorical Donaldson-Uhlenbeck-Yau correspondence	Pranav Pandit	International Centre for Theoretical Sciences - Bangalore
2	Apr 16, 2019	A theorem of Hadamard Borel and Caratheodory and its applications	Tarlok Nath Shorey	IIT Bombay
3	Jun 21, 2019	Expansive automorphisms of nilpotent Lie groups	Manoj Choudhuri	IITRAM - Ahmedabad
4	Jun 24, 2019	Two questions on Belyi's Theorem	Kirti Joshi	University of Arizona
5	Jul 01, 2019	Volume Approximations: From Convex to Complex Analysis	Purvi Gupta	Rutgers University
6	Jul 18, 2019	Relations in non-commutative Iwasawa Algebra and big image Galois representation	Jishnu Ray	The University of British Columbia - Canada
7	Jul 23, 2019	Percolation theory: from classical to dependent models	Subhajit Goswami	IHES - Paris
8	Aug 01, 2019	Distance matrices of trees: invariants; old and new	Projesh Nath Choudhury	Indian Institute of Science - Bangalore

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
9	Aug 16, 2019	A central value formula of degree 6 complex L-series and arithmetic applications	Aprameyo Pal	University of Duisburg-Essen (Germany)
10	Aug 19, 2019	Disordered systems at complex temperatures: Phase Diagrams; fluctuations and zeros	Anton Klimovsky	University of Duisburg-Essen; Germany
11	Aug 19, 2019	Understanding stress and how to deal with it	Mala Giridhar	Bangalore
12	Aug 19, 2019	Convergence of the Aldous chain on cladograms in the state space of algebraic measure trees	Wolfgang Lohr	University of Duisburg-Essen; Germany
13	Aug 26, 2019	Looking beyond the $\tilde{\text{algebra}}^{\text{TM}}$ in Murray-von Neumann algebras	Soumyashant Nayak	University of Pennsylvania
14	Aug 27, 2019	A Brief History of Sequence Alignment	Soumyashant Nayak	University of Pennsylvania
15	Aug 29, 2019	A product formula for homogeneous characteristic functions	Bhaskar Bagchi	Indian Statistical Institute - Bangalore (Retd.)
16	Sept 06, 2019	Weil conjectures; Etale cohomology	Bharath Sethuraman	California State University
17	Sept 11, 2019	On the speed of a front for stochastic reaction-diffusion equations	Leonid Mytnik	TECHNION - Israel Institute of Technology
18	Sept 12, 2019	Macdonald polynomials and level two demazure modules for affine $sl_{n+1}$	Rekha Biswal	Max Planck Institute-Bonn
19	Sept 13, 2019	Weil conjectures; Etale cohomology (Contd.)	Bharath Sethuraman	California State University
20	Sept 16, 2019	Weil conjectures; Etale cohomology (Contd.)	Bharath Sethuraman	California State University
21	Sept 16, 2019	Dynamics Of Propagating Modes and Characterisation Of Ordering In Coupled Non-Equilibrium Systems	Shauri Chakraborty	S.N.Bose National Centre for Basic Sciences; Kolkata
22	Sept 16, 2019	Percolation in enhanced random connection model.	Sanjay Kumar Jhavar	Dept. of Mathematics; IISc
23	Sept 17, 2019	The Duckworth Lewis method	Rajesh Sundaresan	ECE IISc
24	Sept 19, 2019	The Large Intersection Property and Hyperbolic Groups	Debanjan Nandi	TIFR Mumbai
25	Sept 20, 2019	Quasi-isometry between warped cones and uniform measured equivalence	Kajal Das	IMPAN (Warsaw)
26	Sept 24, 2019	Universal deformations of dihedral representations	Shaunak Deo	TIFR Mumbai
27	Sept 27, 2019	What determines accuracy of inference based on Sampling	Rajeeva Karandikar	Chennai Mathematical Institute
28	Sept 30, 2019	A Gaussian process in the near-critical planar Ising model	Jianping Jiang	NYU Shanghai; China
29	Sept 30, 2019	Disorder relevance and the random field Ising model	Adam Bowditch	NUS; Singapore
30	Oct 03, 2019	The Hitchin Integrable System & Supersymmetric Quantum Field Theories	Ashwin Balasubramanian	Rutgers University - USA
31	Oct 10, 2019	Compositional and Credible Deep Learning	Soma S Dhavala	Visiting Faculty; PES University
32	Oct 15, 2019	Trees in our Cities Sentinels Supports and Steadfast Companions	Seema Mundoli	Azim Premji University
33	Oct 21, 2019	Topology of random $\tilde{\text{Ech}}$ complexes in thermodynamic regime.	Akshay Goel	Kyushu University; Japan

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
34	Oct 21, 2019	Empirical Measure and Small Noise Asymptotics under Large Deviation Scaling for Interacting Diffusions	Amarjit Budhiraja	UNC Chapel Hill; USA
35	Oct 29, 2019	Apps Business Technology and Future	Vijay Puttaraju	appZUI
36	Oct 31, 2019	Spectral analogues of strong multiplicity one theorem	Chandrasheel Bhagwat	IISER; Pune
37	Nov 08, 2019	The G.-C. Rota approach and the Lehmer conjecture	Bernhard Heim	GU TECH - Muscat
38	Nov 11, 2019	New methods of clustering time series data and its applications	Soudeep Deb	NBC Universal - USA
39	Nov 14, 2019	Some contributions of motivic homotopy theory to the theory of algebraic groups	Anand Sawant	TIFR; Mumbai
40	Nov 15, 2019	Rost nilpotence	Anand Sawant	TIFR; Mumbai
41	Dec 16, 2019	Quantum Majorization in Infinite Dimensions	Priyanga Ganeshan	Texas A&M University
42	Dec 17, 2019	Directions in Quantum Stochastic Differential Inclusion	Dauda Alani Dikko	University of Ibadan - Nigeria
43	Dec 17, 2019	Lecture Series on `Quantum Gaussian States	K. R. Parthasarathy	Emeritus Distinguished Scientist, Indian Statistical Institute - Delhi Centre
44	Dec 19, 2019	Lecture Series on `Quantum Gaussian States	K. R. Parthasarathy	Emeritus Distinguished Scientist, Indian Statistical Institute - Delhi Centre
45	Dec 31, 2019	Waiting Time until Success	Jyotirmoy Sarkar	Indiana University-Purdue University Indianapolis
46	Jan 02, 2020	On some additive mappings in rings and algebras	Shakir Ali	Aligarh Muslim University - Aligarh
47	Jan 21, 2020	R and R a De novo Method to Improve Data Access and Share AI Generated Metadata	Talapady N Bhat	National Institute of Standards and Technology USA
48	Feb 04, 2020	Are Probabilities in the Mind or in the World	Tarun Menon	National Institute for Advanced Study Bangalore
49	Feb 07, 2020	Two unsolved problems: Birkhoff--von Neumann graphs and PM-compact graphs	Nishad Kothari	University of Campinas
50	Feb 24, 2020	On the decimal expansion of $\log(2020/2019)$ and $e^e$	Yann Bugeaud	Universite de Strasbourg - France
51	Feb 17, 2020	Lecture Series on "Quantum mechanics and operator theory"	K.B. Sinha	SERB-Distinguished Fellow at JNCASR, Bangalore
52	Feb 18, 2020	Lecture Series on "Quantum mechanics and operator theory"	K.B. Sinha	SERB-Distinguished Fellow at JNCASR, Bangalore
53	Feb 19, 2020	Lecture Series on "Quantum mechanics and operator theory"	K.B. Sinha	SERB-Distinguished Fellow at JNCASR, Bangalore
54	Mar 03, 2020	$E_0$ - semigroups on factors	R Srinivasan	Chennai Mathematical Institute - Chennai
55	Marach 12, 2020	On the Brumer-Stark conjecture and Hilbert's 12th problem	Mahesh Kakde	Indian Institute of Science - Bangalore

## SMU, Delhi

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Apr 8, 2019	What is the dimension of a stochastic process?	Anirvan Chakraborty	IISER Kolkata
2	Apr 10, 2019	Stably free modules over smooth real affine algebras	Md. Ali Zinna	IISER Kolkata
3	Apr 16, 2019	Spaces of Von-Neumann Algebras	Issan Patri	CMI, Chennai
4	Apr 24, 2019	On the Selmer group elliptic curves of certain $p$ -adic Lie extension	Lachit Bora	JNU
5	May 8, 2019	Self-dual Cuspidal Representations	Manish Mishra	IISER Pune
6	Jun 20, 2019	Blind deconvolution using natural image priors	Kaustav Nandy	ISI Delhi
7	Jun 25, 2019	A General Frequency Domain Method for Assessing Spatial Covariance	Soutir Bandyopadhyay	Colorado School of Mines
8	Jul 17, 2019	Embedding balanced infinite color urn models into trees	Debleena Thacker	Department of Mathematics, Uppsala University, Sweden
9	Jul 29, 2019	Multi-agent Dynamics in Networks: an exercise in social network analysis	S. Lakshminarayanan	School of Computer Science, University of Oklahoma
10	Aug 21, 2019	Singer Cycles and Unimodular Polynomial Matrices over Finite Fields	Samrith Ram	IIT Delhi
11	Sept 4, 2019	On the speed of a front for stochastic reaction-diffusion equations and the dual particle systems	Leonid Mytnik	TECHNION, Israel Institute of Technology
12	Oct 9, 2019	Hadamard powers of positive matrices	Gayathri Varma	NIT Calicut
13	Oct 14, 2019	On a conjecture concerning the multiplicity of the Tribonacci sequence	Alain Togbe	Perdue University Northwest USA
14	Oct 23, 2019	A quadruple of $ \mathbb{Z} $ factors.	Keshab Bakshi	CMI, Chennai
15	Oct 25, 2019	High Dimensional Central Limit Theorem	Debraj Das	IIT Kanpur
16	Nov 20, 2019	Growth of torsion groups of elliptic curves upon base change	Filip Najman	University of Zagreb, Croatia
17	Dec 12, 2019	An analogue of the Bombieri-Vinogradov Theorem for Fourier coefficient of cusp forms	Ratnadeep Acharya	RKMVERI Belur
18	Jan 8, 2020	Distance matrices of trees: invariants, old and new	Projesh Nath Choudhury	Indian Institute of Science
19	Jan 14, 2020	Ramanujan's $q$ -continued fractions	Gaurav Bhatnagar	JNU
20	Jan 22, 2020	Gauge theories and noncommutative geometry	Giovanni Landi	University of Trieste
21	Jan 29, 2020	Regular Bernstein blocks	Manish Mishra	IISER, Pune
22	Feb 04, 2020	Additive bases in infinite abelian semigroups	Pierre-Yves Bienvenu	Camille Jordan Institute, Lyon, France
23	Feb 12, 2020	Some recent results on uniform intersecting hypergraph?	Kaushik Majumder	IIT Goa
24	Feb 18, 2020	Two unsolved problems: Birkhoff-von Neumann graphs and PM-compact graphs	Nishad Kothari	University of Campinas
25	Feb 19, 2020	Higher-order fluctuations in dense graph limit theory	Gursharn Kaur	National University of Singapore
26	Feb 26, 2020	Lipschitz geometry of Hilbert spaces - Some recent developments	M. A. Sofi	Central University of Kashmir
27	Feb 28, 2020	A new parametrization of quantum gaussian states and some applications	Tiju Cherian John	ISI Delhi

## SMU, Kolkata

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Apr 08, 2019	Non-vanishing of Hilbert-Poincaré series	Moni Kumari,	TIFR, Mumbai
2	May 20, 2019	An introduction to p-adic and mod p Galois representation	Shalini Bhattacharya	IISER Tirupati
3	May 31, 2019	Sumset conjecture of Erdos	B. V. Rao	Chennai Mathematical Institute
4	Jun 21, 2019	An Extremal Problem Related to Weighted Davenport Constant	Eshita Mazumdar	IIT Jammu
5	Jul 11, 2019	Gonek-Hejhal conjecture and estimates of the Mertens function	Biswajyoti Saha	University of Hyderabad
6	Jul 17, 2019	The Large intersection property and hyperbolic groups	Debanjan Nandi	TIFR Mumbai
7	Jul 25, 2019	Correlation of multiplicative functions on function fields	Anirban Mukhopadhyay	IMSc, Chennai
8	Jul 29, 2019	Recent developments in the Study of Single-Index Type Models	Moulinath Banerjee	University of Michigan
9	Jul 30, 2019	Pimsner-Popa basis and angle between intermediate sub factors	Keshab Bakshi	Chennai Mathematical Institute
10	Aug 05, 2019	Congruence of modular forms and Special values of adjoint L-functions	Tadeshi Ochiai,	Osaka University
11	Aug 05, 2019	Topology of Sobolev $W^{k,p}$ -bundles via Coulomb gauges in critical dimension	Swarnendu Sil	Forschungsinstitut für Mathematik, ETH Zurich
12	Aug 19, 2019	The phase transition of planar random cluster model for $q > 4$ is discontinuous: two short proofs and a new graphical representation of the six-vertex model	Gourab Ray	University of Victoria
13	Aug 21, 2019	The Contact Process with Avoidance	Shirshendu Chatterjee	City College of New York
14	Aug 26, 2019	Limiting Distribution and Large Deviation of Bernoulli Chaos on Graphs	Somabha Mukherjee	University of Pennsylvania
15	Aug 29, 2019	The Normalized Matching Property in Random and Pseudorandom graphs	Niranjan Balachandran	IIT Bombay
16	Sept 05, 2019	Lattices, reflection groups and Modular forms	Tathagata Basak	Lowa State University
17	Sept 05-06, 2019	On the speed of a front for stochastic reaction-diffusion equations	Leonid Mytnik	Technion
18	Sept 11, 2019	Semi-Injectivity of Local Homeomorphisms and The Jacobian Conjecture	Teruo Asanuma	University of Toyama
19	Sept 19-20 and Sept 23-24, 2019	Automorphic L-functions	Ravi Raghunathan	IIT Bombay
20	Sept 20-23 and Sept 24-25, 2019	Introduction to arithmetic progressions in the primes	D. Surya Ramana	HRI, Allahabad
21	Sept 23, 2019	The decomposition of unstable homotopy	David Blanc	University of Haifa, Israel
22	Oct 01, 2019	Gaussian approximation for multiple time series and applications	Sayar Karmakar	University of Florida
23	Oct 15, 2019	Crossed Products and Coding Theory	Yuval Ginosar	University of Haifa, Israel
24	Nov 05, 2019	Invariants of weaving knots and volume bounds	Rama Mishra	IISER Pune

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
25	Nov 27, 2019	Two footnotes to Galois's Memoirs	Chandan Dalawat	HRI
26	Dec 02, 2019	Fundamental group of a complex ball quotient	Tathagata Basak	Iowa State University
27	Dec 06, 2019	Distinguished Representations over Finite Fields	U. K. Anandabhardhanan	IIT, Bombay
28	Dec 12, 2019	Extension of Pettis integration: Pettis operators and their integrals	Oscar Blasco	University of Valencia, Spain
29	Dec 13, 2019	Cohomology of the space of polynomial morphisms on $\mathbb{A}^1_{\mathbb{K}}$ with prescribed ramifications	Oishee Banerjee	University of Bonn
30	Dec 16, 2019	Making the black box effective: What Statistics can offer?	Emmanuel J. Candes	Stanford University.
31	Dec 16, 2019	Fast multi-precision computation of some Euler products	Olivier Ramare	Aix Marseille University.
32	Dec 23, 2019	Minimax exponents of sparse testing	Subhabrata Sen	Harvard University.
33	Dec 23, 2019	A modern maximum-likelihood theory for high-dimensional logistic regression	Pragya Sur	Harvard University
34	Dec 23, 2019	Convex co-compact groups and Hilbert geometries	Mitul Islam,	University of Michigan, Ann Arbor.
35	Dec 24, 2019	Random walks on Tori and normal numbers in self similar sets.	Arijit Ganguly	IIT Kanpur
36	Dec 27, 2019	On quadratic twisting of epsilon factors for modular forms with arbitrary nebentypus	Debargha Banerjee	IISER Pune
37	Jan 01, 2020	Weyl bound for $p$ -power twist of $GL(2)$ - $L$ -functions	Saurabh Kumar Singh	IIT Kanpur
38	Jan 02, 2020	Outlier detection and a tail-adjusted boxplot based on extreme value theory	Shrijita Bhattacharya	Michigan State University.
39	Jan 03, 2020	Empirical Likelihood Under Mis-specification: Degeneracies and Random Critical Points	Sanjay Chaudhuri	National University of Singapore.
40	Jan 06, 2020	Multivariate Rank-based Distribution-free Nonparametric Testing using Measure Transportation.	Bodhisattava Sen	Columbia University, USA.
41	Jan 06, 2020	Trace formulae for multi-operator families	Kalyan B Sinha	JNCASR, Bangalore.
42	Jan 07, 2020	Some analytic aspects of automorphic forms and $L$ -functions	Abhishek Saha	Queen Mary University of London.
43	Jan 07, 2020	Conformal field theory and operator algebras	Yasu Kawahigashi	University of Tokyo.
44	Jan 07, 2020	Covariance formulas for fluctuations of linear spectral statistics for Wigner matrices with few moments	Anna Maltslev	Queen Mary University of London
45	Jan 08, 2020	Transverse Increments of Passage Times in first Passage Percolation in $\mathbb{Z}^2$ .	Ujan Gangopadhyay	University of Southern California.
46	Jan 13, 2020	A probabilistic approach to conformal blocks, conformal bootstrap and AGT conjecture	Prompt Ghosal,	Columbia University, USA.
47	Jan 13, 2020	Prime Powers Dividing Products of Consecutive Integer Values of $X^{2^n} + 1$	Pallab Kanti Dey	RKMVERI, Belur
48	Jan 14, 2020	Solutions to the quantum YB equation and related deformations	Giovanni Landi	University of Trieste
49	Jan 15, 2020	Graphon Dynamics	Frank den Hollander	Leiden University, The Netherlands

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
50	Jan 27, 2020	Extreme value theory for heavy-tailed time series: an overview	Philippe Soulier	Universite Paris Nanterre.
51	Mar 03, 2020	Critical points of the localization landscape	Koushik Ramachandran	TIFR, CAM.



## Centre for Soft Computing Research (CSCR)

Sr. No.	Date	Title of Lecture	Name of Speaker	Affiliation of Speaker
1	Jul 02, 2018	Machine learning for remote sensing data analysis	Gustau Camp-valls	University de Valenica, Spain
2	Jan 06, 2020	Visual illusions of angle as an application of Lie transformation groups: A brief mathematical exploration	Sauvik Mukherjee	CSCR, ISI, Kolkata

## 7.4 Regional Mathematical Olympiad (RMO- 2019) and Indian National Mathematical Olympiad (INMO -2020)

The Mathematical Olympiad Programme in India, which leads to participation of Indian students in the International Mathematical Olympiad (IMO) is organized by the Homi Bhabha Centre for Science Education (HBCSE) on behalf of the National Board for Higher Mathematics (NBHM) of the Department of Atomic Energy (DAE), Government of India. Its main purpose is to spot mathematical talent among pre-university students in the country. For the purpose of *training and selection of students* for the Olympiad contest, 25 regions all over the country have been designated and each assigned a Regional Coordinator. Additionally, three groups (Central Board of Secondary Education (CBSE), Navodaya Vidyalaya Samiti (NVS) and Kendriya Vidyalaya Sangathana (KVS) have a 'Regional Coordinator' each.

The Indian Statistical Institute (ISI), Kolkata organizes the Regional Mathematical Olympiad (RMO) followed by the Indian National Mathematical Olympiad (INMO) for West Bengal while the Bangalore Centre of ISI has been co-ordinating the RMO and INMO for Karnataka for several years. The regional Co-ordinator from ISI, Kolkata is Dr. Mridul Nandi from ASU. Dr. Manish Kumar, SMU, Bangalore is the regional Co-ordinator for Karnataka.

### Activities:

Pre-Regional Mathematical Olympiad (Pre-RMO) is organized regionally prior to the RMOs for the purpose of selecting candidates for RMO.

**RMO, 2019 was held on October 20, 2019** - 573 students from Karnataka and 631 students from West Bengal appeared for the test at the ISI Bangalore Centre and ISI Kolkata Centre respectively. Based on their performance, 41 students qualified for the INMO in each region.

**Training camps** - A week long training camp for students was organized at both regional centres. The purpose of the camps was to train prospective candidates for INMO-2020. 65 students from the Bangalore Centre and 49 students from the Kolkata Centre were familiarized with advanced problem solving techniques during **January 15-18, 2020** at the *ISI Bangalore Centre* and during **December 30, 2019 - January 03, 2020** at *ISI, Kolkata*. Several distinguished speakers including ISI faculty members and

students who had previously represented India in IMO were invited for delivering lectures.

**INMO, 2020 was held on January 19, 2020** at both the regional centres. Number of participants were 41 from Kolkata and 59 from the Bangalore Centre.

**March 11, 2020-** The **XXXII Asian Pacific Mathematical Olympiad** exam was held at ISI Bangalore Centre which is organized by the Homi Bhabha Centre for Science Education for which Dr. Manish Kumar is the Regional Co-ordinator for Karnataka region. Four students were selected out of which 2 students have appeared for the exam.

## 7.5 Outreach activities

Apart from academics, ISI faculty and staff are strongly committed to educational as well as community outreach. Some of the events held during 2019-2020 are as follows-

- Two events were organized for high school students by HGU, Kolkata to promote awareness about ISI. One was held on Sep 4, 2019 at DAV, Bhubaneswar while the other was held on Nov 15, 2019 at DPS, Gaya.
- An **Intercollegiate Data Analytics Festival** for college students was organized by ASU, Bengaluru on Sep 18, 2019 at St. Joseph's College, Bangalore.
- **Introducing under graduate college students to algorithms** was organized by ACMU, Kolkata on Sep 23, 2019 at Vivekananda Centenary College, Rahara.
- The following workshops for students, researchers and faculties were organized by MIU, Kolkata-
  - **A Hands-on Deep Learning Workshop** on Jun 07, 2019 at CSCR, ISI (in association with NVIDIA-DLI, JU, D-LAB-KMUTT) funded by NVIDIA
  - **One day Workshop on Remotely Sensed Data Analysis by Machine Learning Tools** on Jul 03, 2019 at IEEE GRSS
- **Two-day Workshop on Machine Learning and Big Data Analytics: Application to Remote Sensing** on Aug 19, 2019 at IEEE Geoscience and Remote Sensing Society (GRSS), Sikkim University, NIELIT
- **International Workshop on Advanced Machine Learning Techniques for Climate Informatics** IEEE GRSS (Kolkata Chapter) CHAPNET-2019: on Nov 04, 2019 at ISI, Kolkata.
- **Astro Scope for the Youngsters: A Space Odyssey**- Library Documentation & Information Science Division together with Physics and Applied Mathematics Unit (PAMU), Indian Statistical Institute organized a one day interactive science awareness programme on Astronomy, Astrophysics and Space Science through lectures/demonstrations, visual descriptions and interactions of experts with students. The event was held on Nov 11, 2019 at ISI, Kolkata. About 250 participants from 50 different schools of West Bengal attended the program which was a huge success.



Space Odyssey

- **Inspire Camp** was organized by SMU, Bengaluru on Nov 15-19, 2019 at Shri Ganambika Degree College, Madanapalli, Chittoor Dist. It was aimed to inspire young students of Classes 11 and 12 to take up Science.
- In order to propagate the activities of the Chennai centre, SQC&OR, Chennai organized a session with the rubber industry professionals on Nov 23, 2019 at CII, Madurai.
- **Advanced Instructional School (AIS): a short course on Positive Definite kernels** was organized by SMU, Bengaluru on Dec 22-26, 2019 for young researchers and teachers at IIT, Kanpur.
- **Deep time Biodiversity of Bengal** was organised by GSU, Kolkata on Jan 27-28, 2020 for school children, research scholars, general audience to create awareness among people for proper conservation of the fossil heritage of West Bengal.
- **The 5<sup>th</sup> Basic Multimedia Training for School Students** was organized by Library from 27th January to 14th February 2020. Twenty participants, many from economically challenged families, joined the programme. Five were teachers from West Bengal Board of Education affiliated Bengali/Hindi/Urdu medium schools. Students were involved in hands on session, tests and project work. After successful completion participants received certificates and awards.
- A **Doctoral Symposium and Scholars' Colloquium** was organized by CSCR, Kolkata during the 4th International Conference on Computational Intelligence and Networks (CINE 2020), February 27-29, 2020. It was designed to provide a platform to Doctoral Scholars working in Computational Intelligence, Control & Communication Networks and Complex Dynamical Networks to showcase their work, interact with experts, meet and exchange ideas, collaborate and work together. Eight Research Scholars who attended the event were provided travel grant.
- The NE Centre at Tezpur regularly organizes a number of outreach activities for the schools and colleges of the north-eastern states, like-
  - Siang Model School and Kendriya Vidyalaya Pasighat, East Siang District, Arunachal Pradesh on Oct 17, 2019
  - Delhi Public School, ONGC, Nazira, Sibsagar, Assam on Jan 25, 2020
  - Winter School on Mathematics for Post Graduate Students of the North-Eastern States during Jan 28-Feb 01, 2020



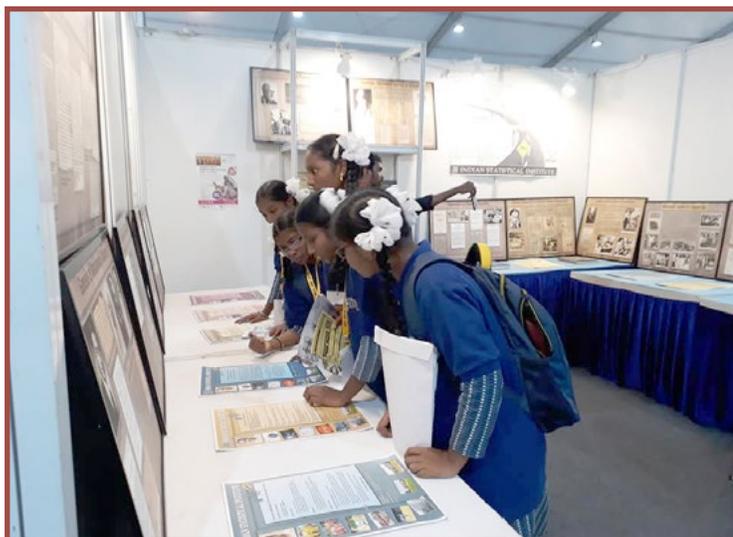
Participants of the Multimedia workshop



Outreach programme at Siang Model School, Pasighat, East Siang District, Arunachal Pradesh on October 17, 2019



Outreach programme at Kendriya Vidyalaya Pasighat, East Siang District, Arunachal Pradesh on October 17, 2019



Exhibition IISF 2019



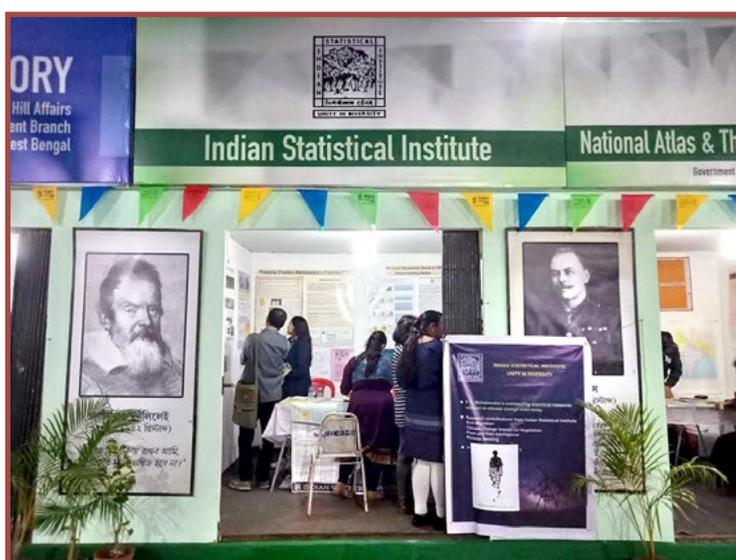
Exhibition IISF 2019

ISI also participated in community events like fairs and set up booths to create awareness in general. Two such events are-

- **Exhibition at India International Science Festival (Nov 5-8, 2019)** - Library, Documentation and Information Science Division participated in the 5th India International Science Festival (IISF) at Viswa Bangla Convention Centre, Kolkata where the contributions of Prof. P C Mahalanobis for the development of the Nation was show cased through an exhibition.
- **Stall at Science & Technology Fair (Jan 16-19, 2020)**- The Library in collaboration with the Agricultural & Ecological Research Unit participated in the Science & Technology Fair 2020 (Theme- Climate Change) at Hedua Park, Kolkata. ISI highlighted Prof. Mahalanobis's contribution in this area and the current work undertaken on this theme by the Agricultural & Ecological Research Unit. ISI lifted the **Best Stall** award at this event.



Stall award



Stall at Science fair



Exhibition IISF 2019



# 08

## ADMINISTRATION



341 **No. of Scientific and Technical Workers**

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420 **No of Non-Scientific Workers**

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645 **No. of Male Workers**

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116 **No. of Female Workers**

## 8.1 Administrative Services Division

The Administrative Services Division at the Headquarters caters to the various needs of the Scientific Workers in all the Scientific Units of the Institute engaged in various scientific, research and academic activities and provides them with necessary infrastructural facilities in their pursuit of excellence. The centres at Delhi, Bangalore, Chennai and Tezpur, each having a number of scientific units, by and large are getting administrative support from the administrative units/sections there. The Administrative Services Divisions of the Institute has the following units at the Headquarters in Kolkata:

Sl. No.	Name of the Unit	Sl. No.	Name of the Unit
1.	Accounts Section	17.	Import & Travel Cell
2.	Audio-Visual Unit	18.	Internal Audit Cell
3.	Canteen Unit	19.	Legal Cell
4.	Cash Unit	20.	Medical Expenses Reimbursement Unit
5.	CE (A & F)'s Office	21.	Medical Welfare Unit
6.	Despatch Unit	22.	Personnel Unit
7.	Central Stores	23.	Provident Fund Unit
8.	Council Section	24.	Public Relations Unit
9.	Director's Office	25.	Printing and Publication Unit
10.	Electrical Maintenance Unit	26.	Official Language Cell
11.	Engineering Unit	27.	Retirement Benefit Cell
12.	Estate Office	28.	RTI, Grievance, Complaints and Vigilance Cell
13.	Guest House	29.	Security Unit
14.	Hostels	30.	SC / ST / OBC Liaison Cell
15.	House Building Advance Cell	31.	Telephone Unit
16.	Human Resource Development	32.	Transport Unit

Apart from the above mentioned Units, there are few cells dealing with Budget, and other issues to take care of the specific needs of the Institute. The Administrative Services Division also looks after the running of Hostels for Students, Research Scholars and International Statistical Education Centre (ISEC) Trainees and also the running of Canteens for the workers and students of the Institute. The other outlying Units are controlled directly by the Headquarters at Kolkata. The Administrative Services Division takes the responsibility for all new constructional activities of the Institute at its Headquarters and also at outlying centres/ branches. A brief report on the construction and other activities during the year is narrated in the subsequent paragraphs.

The Administrative activities in the four Centres, namely Delhi, Bangalore, Chennai and North East Centre at Tezpur and in other outlying branches of the Institute and Giridih Office, are more or less similar to the Headquarters but on a much smaller scale.



## 8.2 Office Bearers of the Institute Administration

### Office bearers of the Institute Administration during the year:

Director	Prof. Sanghamitra Bandyopadhyay
Professors-in-Charge of	Prof. B.V. Rajarama Bhat (Theoretical Statistics & <i>Scientific Divisions</i> Mathematics) Prof. Sumitra Purkayastha (Applied Statistics) Prof. E. Somanathan (Social Sciences) Prof. Parthasarathi Ghosh (Physics & Earth Sciences) Prof. Susmita Mukhopadhyay (Biological Sciences) Prof. Bhabatosh Chanda (Computer & Communication Sciences)
Head, SQC & OR	Dr. Ashis Kr. Chakraborty
Head, Delhi Centre	Prof. S.K. Neogy
Head, Bangalore Centre	Prof. C.R.E. Raja
Acting Head, Chennai Centre	Dr. D. Sampangi Raman
Head, North-East Centre, Tezpur	Prof. Nityananda Sarkar and Dr. Tapan Chakraborty
Dean of Studies	Prof. Goutam Mukherjee
Chief Executive (A & F)	Brigadier Jagdish Narayan Pandey (Retd.)

## 8.3 List of workers joined/ retired/ voluntarily retired/ resigned/ terminated/ died during the year

### A. Appointments

#### (i) Scientific / Technical Workers

1. Saurabh Trivedi
2. Partha Sarathi Mukherjee

#### (ii) Non-Scientific Workers

- |                         |                         |                      |
|-------------------------|-------------------------|----------------------|
| 1. Samapan Padhi        | 12. Payal Sana          | 23. Saradindu Thakur |
| 2. Ashwini Ganesh Tambe | 13. Dipak Kumar Das     | 24. Panchanan Tanti  |
| 3. Nayan Chandra Majee  | 14. Rukmini Shaw        | 25. Tanuka De        |
| 4. Sadanandam Maanupati | 15. Durlabh Hembram     | 26. Khusboo Singh    |
| 5. Bikash Kumar Singh   | 16. Kuntal Hazra        | 27. Satadru Ghosh    |
| 6. Monami Mondal        | 17. Anitya Sundar Mandi | 28. Sayan Kumar Ukil |
| 7. S. Vignesh           | 18. Riju Biswas         | 29. Yogesh Kumar     |
| 8. Snehasis Mukherjee   | 19. Archana Kumari Shaw | 30. Abhishek Roy     |
| 9. Saumya Halder        | 20. Mir Asif Iqbal      | 31. Tanushree Dey    |
| 10. Shalini Singh       | 21. Souradip Das        | 32. Souvik Tarafdar  |
| 11. Sanjoy Das          | 22. Swarat Sabui        | 33. Suman Rudra      |

34. Ravi
35. Ujjwal Mondal
36. Pratush Das
37. Arnab Sinha
38. Amrita Roy
39. Deepak
40. Rajesh Halder
41. Tapan Sarkar
42. Arpan Biswas
43. Debashis Paul

44. Samrat Biswas
45. Soma Adhikari
46. Utpal Mahato
47. Dipankar Das
48. Debodyuti Bandyopadhyay
49. Prince Arifuddaullah Shaikh
50. Avijit Sahoo
51. Sumit Das
52. Raghu Thota
53. Arjun Banerji

54. Subhajyoti Das
55. Abhishek Mandal
56. Tapashi Srimani
57. Gobinda Bhattacharya
58. Vineet Kumar
59. Sagnik Chakraborty
60. Tuhin Sen
61. Bikramjit Dutta

## B. Retirement/Voluntary Retirement:

### (i) Scientific & Technical Workers

1. Alok Goswami
2. Sunil Kr. Bhar
3. Satya Ranjan Chakravarty
4. P.K. Perumallu
5. C. Gopalakrishnan
6. Rabindra Narayan Das
7. A.R.D. Prasad

8. Amita Majumder
9. Shyamal Kanti Bhattacharya
10. Satyajit Basu
11. Ashim Kumar Roy
12. Barun Mukhopadhyay
13. Pabitra Pal Choudhury
14. Nandlal Singh

15. R.B. Bapat
16. Nityananda Banik
17. Nityananda Sarkar
18. Swagata Chakraborty
19. Sunanda Bagchi

### (ii) Non-Scientific Workers

1. Vijay Kr. Ojha
2. Ram Prasad Basfore
3. G. N. Ramachandra
4. Bholanath Pal
5. H.D. Adoni
6. Chinmoy Bhattacharya
7. Nemaï Kr. Sarkar
8. Partha Acharya
9. Tapan Kr. Dhara
10. R. Thimmaiah

11. Mintu Paul
12. Swapan Kr. Pal
13. G. Navaneethan
14. Anutosh Kr. Biswas
15. Samir Kumar Mallick
16. Saroj Kr. Chakraborty
17. H. Rangaswamy
18. Ganga Ram
19. Bablu Kr. Majumder
20. Hari Das Chakraborty

21. Rabi Malick
22. Raj Kumar Mishra
23. Bindeswari Routh
24. Joi Prakash Lahar
25. Munni Devi
26. Mounsu Marandi
27. Pradip Mallick
28. P. Rathnamma
29. K.S. Prasanna Kumari
30. Gita Jana (Samanta)

## C. Resignation/Discontinuation of Deputation

### (i) Non - Scientific Worker

1. Tanushree Dey
2. Dipankar Das
3. Debodyuti Bandyopadhyay

## D. Death

### (i) Scientific Worker

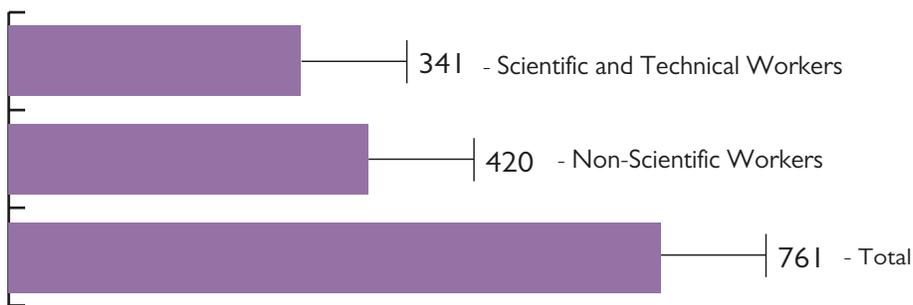
1. Deepankar Ray Chaudhury
2. Malay Dasgupta

### (ii) Non - Scientific Worker

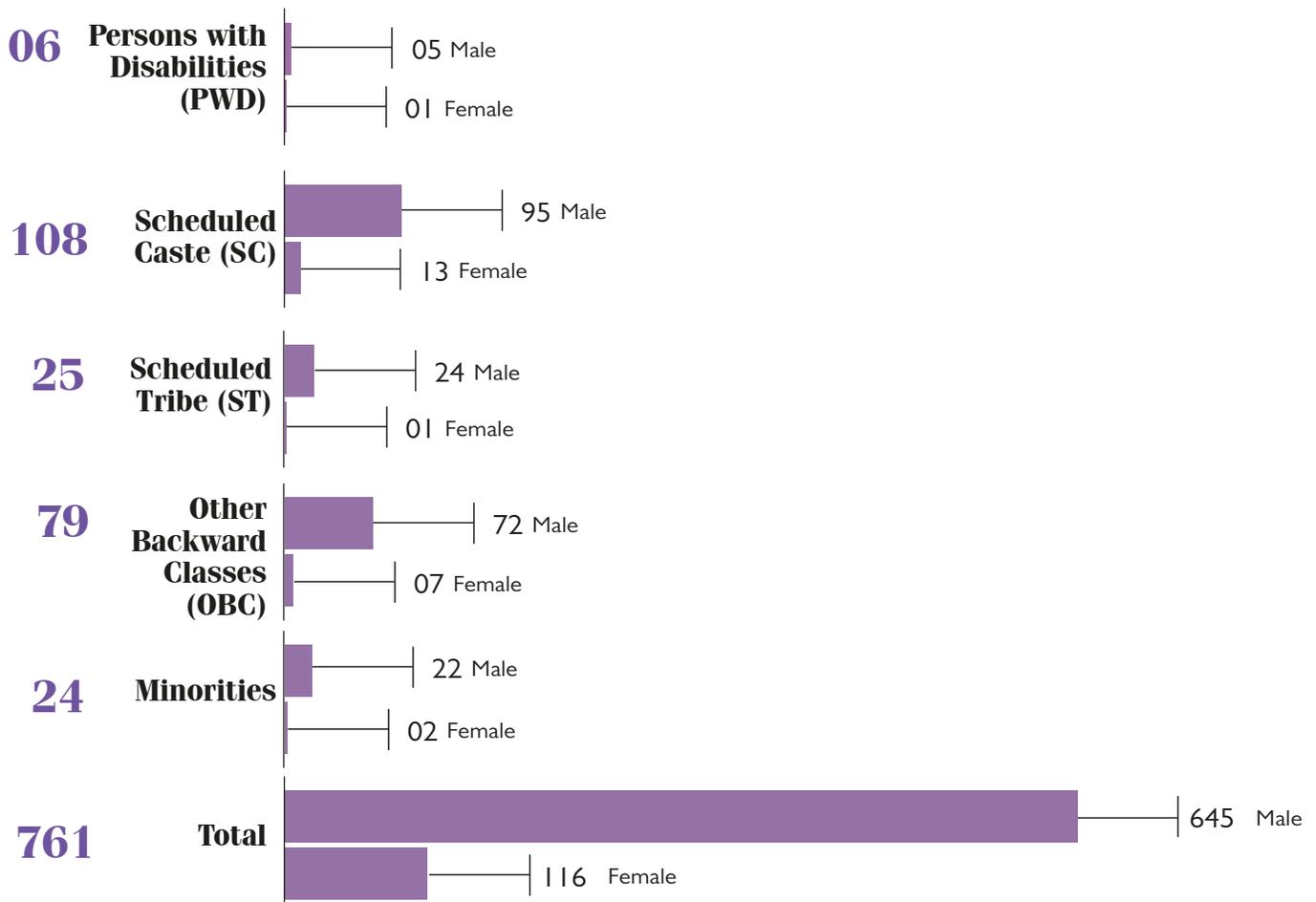
1. Kailash
2. Subarno Topno
3. Tarak Mallick

## 8.4 Manpower by Gender, Social Category and Disability group

Number of workers in the Institute as on 31<sup>st</sup> March 2020:



Breakup of manpower by Gender, Social Category and Disability group as on 31<sup>st</sup> March 2020



## Annual Return on Cases of Sexual Harassment

1. Number of complaints of sexual harassment received in the year	Headquarters - 1
2. Number of complaints disposed off during the year 2019-20.	Headquarters - 1
3. Number of cases pending for more than 90 days.	Headquarters - 1
4. Number of workshops on awareness programmers against sexual harassment conducted during the year.	Bangalore Centre - 2
5. Nature of action.	Headquarter – <i>Suitable action taken as per Standing Service Order of the Institute</i>

## 8.5 RTI

### Applications received and action taken by the Institute under RTI Act, 2005

#### Name of the Appellate Authority:

1. Prof. Sanghamitra Bandyopadhyay, Director, ISI Kolkata.
2. Brig. Jagdish Narayan Pandey (Retd.), CE (A&F), ISI Kolkata.
3. Dean of Studies.
4. Head, Delhi Centre.
5. Head, Bangalore Centre.
6. Head, North-East Centre.
7. Head, Chennai Centre.

#### Name of Central Public Information Officer:

1. Shri Samapan Padhi, Dy. CE (Admn.), ISI Kolkata.
2. Shri Pratyush Banerjee, Dy. CE (Admn.), Delhi Centre.
3. Ms. Ashwini Ganesh Tambe, Dy. C.E (Admn.), Bangalore Centre
4. Shri Anjan Mookherjee, Sr. AO, ISI Kolkata.
5. Shri Durgam Giri, Sr. AO, ISI Kolkata.
6. Shri Biju Mathew, Sr. AO, North-East Centre.
7. Shri R. Sridharan, AO, Chennai Centre.

The summary statement in this regard for the year 2018-19 is given below: -

No. of Applications received	No. of cases accepted	Decisions where requests were fully or partially rejected		No. of decisions from Appellate Authority	C I C decision			Amount collected (Rs.)		
		Fully rejected	Partially rejected		No. of decisions received	Penalty imposed	Disciplinary action, if any	Fee	Other Charges	Penalty amount
145	145	NIL	NIL	39	01	NIL	NIL	1340	3350	NIL

## 8.6 Major Construction/ Repair work undertaken

### A. Kolkata

#### R C Bose Centre for Cryptology and Security

The centre is located at Gupta Niwas campus of the Institute. Planning, Design-Engineering, Execution and overall Project Management for construction of buildings and other infrastructure of the campus was awarded to M/s NBCC as deposit work. Construction activity started from May, 2015. Hostel building (G+7) was put to use from October, 2018. Construction of the Cryptology Centre (G+7), two Residential Blocks (G+10 & G+4), restoration of old Gupta Niwas and area development work is in progress. Building superstructures are complete; interior & exterior finishing works and building-services like sanitary & plumbing, electrical, HVAC, Fire-Fighting and suppression system are in progress. Estimated project cost is about Rs. 80 crore. The cumulative expenditure was Rs. 81.34 crore with expenditure during the FY 2019-2020 Rs. 6.1 crore. The project is expected to complete by December, 2020.

#### Construction of New Academic Building

Construction of a new Academic Building (G+5) has been taken up at main campus as deposit work. M/s Bridge & Roof Co (India) Ltd is the project implementing agency. Planning, Geotechnical Investigation, Detailed Design Engineering and cost estimation completed. Total sanctioned cost of the building is Rs. 37.70 crore. The tendered cost is Rs. 26.12 crore (excluding PMC charge). The pile foundation work has started. Rs. 2.6 cr was paid as initial deposit.

#### Repair, Renovation work of R. A. Fisher Bhavan & S.N. Bose Bhavan

Major repair and renovation of these two buildings at the main campus were in progress during 2017-18. M/s Bridge & Roof is the implementing agency. Repair renovation of building external surface, structural repair, toilets including sanitary & plumbing system renovation, renovation of offices of some Units etc. are mainly in the scope of work. Work at RA Fisher Bhavan has been completed in December 2019. At SN Bose Bhavan, repair work is complete and new lift installation is expected to complete by September 2020. The cumulative expenditure was Rs. 4.63 crore with expenditure during the FY 2019-2020 Rs. 56 lakh.

#### Repair, Renovation work of M. Tech Hostel

Major repair and renovation of this building at the residential campus were in progress during 2019-20. M/s CPWD is the implementing agency. Repair renovation of building external surface, structural repair, toilets including sanitary & plumbing system renovation, renovation of hostel rooms, canteen area etc. are mainly in the scope of work. Total sanctioned cost of the building is Rs. 5.57 crore. Due to inordinate delay by the contractor, CPWD have terminated the contract and engaged two new contractors in 2019-20 to complete the balance work. Work is expected to be completed by December 2020. Rs. 1.86 crore was paid as initial deposit in FY 2017-2018. As progress of work was very slow there was no expenditure during the reporting period.

### B. Delhi

Major civil and electrical works during the period April 01, 2019 to March 31, 2020 are:-

#### (CIVIL WORKS)

Sl. No	Description of Work	Total Amount
<b>Work Completed</b>		
1.	Consultancy Service For Rehabilitation of Platinum Jubilee Hostel	Rs. 11,80,000/-
<b>Work In Progress</b>		
1.	Renovation work of Guest House	Rs. 64,32,800/-
2.	Window Replacement Work in ' A ' and ' B ' Block Flats	Rs. 65,06,500/-

#### (ELECTRICAL WORKS)

Sl. No	Description of Work	Total Amount
1.	Supply Installation Testing and Commissioning of 500 KVA Transformer	Rs. 17,17,793/-
2.	SITC of LIFT in Faculty Block	Rs. 24,34,879/-

## C. Chennai

Earth-filling work was completed for ISI land at Karapakkam. The earth-filling work was allotted to CPWD for an estimate of Rs. 6,16,80,000/-. The final payment of Rs. 64,00,000/- was made to CPWD during the month of July, 19. It was decided in the Infrastructural Development Committee to leave the Karapakkam site for natural compaction for around 2-3 years.

To restrict trespassers, it was decided in the IDC meeting to fix gate for the site. This work was also allotted to CPWD for an estimate of Rs. 2,52,300/- and the payment for the same was made to CPWD during March, 2020.

## D. Tezpur

The ISI North-East Centre shifted from Tezpur University campus to its own campus at Punioni, Solmara and started operating from this permanent campus from 1 June 2019. The Administrative Building and the Academic Building (partially constructed). The construction work is progressing, but very slowly. Further, in response to our formal request, the Government of Assam has now sanctioned the work for construction of the approach road to our permanent campus and the work would start very soon.

The total expenditure amount incurred on campus construction so far is Rs. 24.72 crore and out of which Rs. 6.25 crore spend in the FY 2019-2020.

## 8.7 Budget and Finance

For the year 2019-2020, ISI Council recommended Rs.24935.53 lakhs under salary head Rs.11665.53 lakhs under 'Creation of Assets' head and Rs.6214.77 lakhs under General Head (BE). The Government approved a sum of Rs.23059.00 lakhs, Rs.3842.00 lakhs and Rs.2993.38 lakhs for salary, capital and general expenditure respectively. At the revised estimate stage, the Institute sought for a grant of Rs.27554.00 lakhs, Rs.4802.00 lakhs and Rs.4043.38 lakhs under salary, capital and general respectively, which was also recommended by the ISI Council. The Government sanctioned similar amount of fund as in BE stage under salary, capital & general heads respectively. The revenue expenditure was more by Rs.2320.91 lakhs from the fund allotted by the Ministry and Miscellaneous receipt. Capital Expenditure was Rs.926.26 Lakhs less than the fund allotted. The Audited Annual Accounts of the Institute for the year 2019-2020 has been furnished in Statement of Accounts and Auditors' Report.

## 8.8 Specific Achievements

### 1. Society Type Activities

#### A. Membership: April 2019 – March 2020

During the period 26 persons became Ordinary members of the Institute and 16 Ordinary members became Life members of the Institute.

The membership position as on 31<sup>st</sup> March, 2020 is as follows:

Ordinary Members	-	299
Life Members	-	1053
Institutional Members	-	05
<b>Total</b>	-	<b>1357</b>

#### B. Finance Committee Meetings:

The Finance Committee met thrice in the F.Y. 2019. First on 10th June, 2019 next on 11th October, 2019 and finally on 7th January, 2020. It is mainly organized just before a Council Meeting is held. The main purpose of the Finance Committee Meeting is to approve all the finance related issues before placing it to the Council and also to consider and recommend the Annual Report including Audited Statement of Accounts for the year 2018-2019.

#### C. Council Meetings:

During the period under report (2019-2020), the Council met three times. On 14th June, 2019, on 12th October, 2019 and on 10th February, 2020 to take decisions on various academic and administrative matters of the Institute. In the Meeting of October, 2019, a Search-cum-Selection Committee (ScSc) for the purpose of selecting a Director for ISI, was duly constituted.

## D. Annual General Meeting:

During the period under report (2019-20), the Annual General Meeting was held on 11th November, 2019. The Annual Report of the Institute for the year 2018-2019 and Audited Statement of Accounts for the year 2018-2019 together with the Auditor's comments and replies of the Administration thereto were adopted in this meeting.



ISI Generalbody Group Photo

## 2. Awareness programmes conducted by Medical Welfare Unit

Medical Welfare Unit caters to the health care need of the students, faculty, workers and their family members of Indian Statistical Institute Kolkata.

- 02(two) full time Resident Medical Officers perform regular OPD services as well as emergency medical services as and when required.
- Specialist clinic of EYE and Psychiatry are held two days a week.
- Specialist clinic of ENT is held three days a week.
- Regular counselling sessions by 02 (two) Psychological counsellors are held two days a week, which is availed by the students and all workers and their family members.
- Retired staff and their spouses are provided medical care on OPD basis.
- Some essential medicines are supplied by the pharmacy of MWU.
- Medical fitness certification camp is organized every year by the MWU for the newly admitted students to the institute.

Medical Welfare Unit organizes various awareness programmes for the benefit of workers and students. A large number of workers and students participated in the following seminars and sensitization programmes last year.

### # Sensitization program on Healthy Mind: Way to success on 31<sup>st</sup> August 2019

Speakers: 1. Mr. Mohit Ranadip  
2. Ms Swati Mitra

Venue: Platinum Jubilee Auditorium

### # Sensitization program on Chewable tobacco i.e khaini, gutkha, alcohol & substance abuse i.e drugs and its effect on 31<sup>st</sup> July 2019

Speakers: 1. Dr Sumit Chaterjee (ENT Specialist)  
2. Ms Swati Mitra  
3. Mr. Mohit Ranadip

Venue: Platinum Jubilee Auditorium

## 3. Training programme

Sl. No.	No of Participants	Topics	Venue	Duration
1.	46	Induction Training for Office Assistant-A (Direct Recruit)	ISI, Kolkata	April 22- May 03, 2019
2.	43	Workshop on Overview to GeM	ISI, Kolkata	July 18-19, 2019
3.	2	Negotiation skill & conflict resolution	Administrative Training Institute, Kolkata	March 02-04, 2020
4.	1	Effective presentation skill for workplace	Administrative Training Institute, Kolkata	March 02-04, 2020

## 8.9 Official Language Activity

### Kolkata, Head Quarters

Official Language Cell of the Institute comprises of Shri M.K. Pandey, Senior Administrative Officer & Officer In-charge, Shri Prashant Tiwari, Official Language Officer, Shri Kritibas Majee, Office Assistant "B" and Shri Vishwanath Paul, Attendent 'C'. The Rajbhasha Implementation Committee of the Institute is headed by Prof. Sanghamitra Bandyopadhyay, Director & Chairman and other members of the committee are as follows:-

- |  |                       |
|--|-----------------------|
| 1. Prof. Sanghamitra Bandyopadhyay, Director                         | - Chairman            |
| 2. Prof. Preeti Parashar   | - Chairman (Acting)   |
| 3. Prof. Barun Mukhopadhyay  | - Member              |
| 4. Prof. Amita Pal   | - Member              |
| 5. Brigadier J. N. Pandey, Chief Executive, Retd. (Admin. & Finance) | - Member              |
| 6. Shri Amitabh Mukherjee, Deputy Chief Executive (Finance)          | - Member              |
| 7. Dr. Jadab Kumar Pal, Dy. Chief Executive (Adm.)                   | - Member              |
| 8. Shri Anjan Mukherjee, Senior Administrative Officer               | - Member              |
| 9. Shri Manoj Kumar Pandey, Senior Administrative Officer            | - Member and Convenor |
| 10. Shri Durgam Giri, Senior Administrative Officer                  | - Member              |
| 11. Shri Raj Narayan Mukherjee, Administrative Officer,              | - Member              |
| 12. Shri Sounak Chakraborty, Administrative Officer                  | - Member              |
| 13. Shri Prashant Tiwari, Official Language Officer                  | - Member              |

In accordance with the provisions of the Official Language Act of 1963 and Official Language Rule 1976, the Official Language Cell has been set up by the Indian Statistical Institute. Official Language Implementation Committee has been set up to run the Official Language Cell efficiently. While discussing the annual program set by the Government of India, the Official Language Department, the committee decides the implementation and compliance of the official language, as well as meetings of the Official Language Implementation Committee are organized during each quarter. During each quarter, the compliances and works related to the Official Language are reviewed by the Official Language Implementation Committee in the said meetings.

### Official Language Implementation Committee Meetings: -

During the year 2019-20, the First Quarterly meeting of the Official Language Implementation Committee was held on dated 28.06.2019, second quarterly meeting was held on 30.09.2019, third quarterly meeting was held on 30.12.2018 and the fourth quarterly meeting was held on 20.03.2020 respectively, under the chairmanship of the Prof. Preeti Parashar, Chairman (Acting), of the Institute. During the said meetings, the works related to the Official Language were reviewed and the necessary action was taken accordingly.

### Organizing Hindi Workshop and Technical Workshop: -

Hindi Workshop was organized for the officers / employees of the institute on 21.06.2019, 11.09.2019, 20.12.2019 and 18.03.2020 respectively during every quarter in our institute as per the annual programme issued by the Government of India, Ministry of Home Affairs, Department of Official Language. The said workshops were organized in two sessions. During each workshop, two official language experts working under the

central government or implementing Hindi were invited to give a lecture on various subjects.

A "Technical Workshop for working in Hindi on Computer" was organized for the Officers and Employees of the Institute, in which the said training was conducted by Shri Anoop Kumar, Assistant Director, Hindi Teaching Scheme, Department of Official Language, Ministry of Home Affairs, Government of India, in two sessions on 13th December, 2019.



Guest speaker Shri Naveen Prajapati, Consultant (OL), Central Translation Bureau, MHA, is addressing

## Hindi Pakhwara Celebration:

During the financial year 2019-20, the Hindi Pakhwada program was inaugurated by the Director of the Institute Prof. Sanghamitra Bandyopadhyay on 11th September, 2019. After the inauguration of the Hindi Pakhwada, the Hindi workshop for the officers and employees of the Institute was organized in two sessions.

Hindi Pakhwara was organized from 11.09.2019 to 25.09.2019. During the Hindi Pakhwada, various competitions such as Hindi Essay writing Competition, Hindi Extempore Competition, Vocabulary Competition, Official Language Knowledge Competition, Hindi Recitation Competition were organized in two categories for Hindi speaking and Non-Hindi speaking for the officers/employees working in the Institute and the First, Second and Third Prize winners of the said competitions were awarded Rs.1000/-, 800/- and 600/- cash prize money respectively, as well as other participants were given consolation prizes during the conclusion of Hindi Pakhwada.

## Hindi Language Training, Intensive Hindi Workshop and Training for working in Hindi on Computer: -

During the year 2019-20, Hindi Training Classes were regularly organized in NAB-2 seminar room located in the Institute's campus for getting the working knowledge of Hindi, i.e. Hindi Language Training for the Officials / employees to make proficient in Hindi. The said Hindi Training Classes were taken by Mrs. Poonam Shaw, Hindi Pradhyapak, Hindi Teaching Scheme, Government of India, Ministry of Home Affairs, Official Language Department.

Apart from this, during the year 2019-20, Workers from the various Departments / Sections / Units of the Institute were nominated for the training program for working in Hindi on computer organized by the Central Hindi Training Institute, New Delhi in Kolkata, and to participate in the Intense Hindi Workshop organized in New Delhi for Hindi Training.

## Meetings of Town Official Language Implementation Committee and Official Language Competitions organized under the auspices of TOLIC, Kolkata: -

Our institute is an active member of the **Town Official Language Implementation Committee, Kolkata (Office- 2)**. Shri Manoj Kumar Pandey, Senior Administrative Officer and Official Language in-charge and Shri Prashant Tiwari, Official Language Officer has taken part in the meetings organized by the Town Official Language Implementation Committee, Kolkata (Office-2) during each half of the year on 22.04.2019 and 11.09.2019 respectively.

In addition to this, a **"Special Workshop on Unicode"** was organized by the Town Official Language Implementation Committee Kolkata (Office-2) on 08th November, 2019 from 2:00 PM at C-DAC Campus, Plot E 2/1, Block GP, Sector -v, Bidhan Nagar, Salt Lake, Kolkata - In 700091. This workshop was organized for member offices to speed up the implementation of Hindi by using innovations in the field of information technology, which was attended by Shri Prashant Tiwari, Official Language Officer of the Institute.

Two representatives of the Institute were nominated to participate in the Extempore Competition organised by the Town Official Language Implementation Committee, Kolkata (Office-2) for all member offices of NARAKAS under the aegis of ICAR-National Soil Survey and Land Use Planning Bureau, Kolkata, from 3.00 pm on 7th November 2019. Two representatives of the Institute were nominated to take Participation in Poetry Recitation Competition organised by Town Official Language Implementation Committee, Kolkata (Office-2) for all member offices of NARAKAS under the aegis of ICAR-National Institute of Natural Fibre Engineering and Technology, Kolkata from 3.00 pm on 14th November 2019. A "Technical Workshop for working in Hindi on Computer" was organized for the Officers and Employees of the Institute, in which the said training was conducted by Shri Anoop Kumar, Assistant Director, Hindi Teaching Scheme, Department of Official Language, Ministry of Home Affairs, Government of India, in two sessions on 13th December, 2019. Two representative of



Director of the Institute addressing the workers during the Hindi Fortnight Inauguration Programme



Director Awarding workers of the Institute during Hindi Fortnight Prize Distribution Ceremony

the Institutes were nominated to participate in the Hindi Essay Writing Competition organized by the Town Official Language Implementation Committee, Kolkata (Office-2) for all member offices of NARAKAS under the aegis of Indian Institute of Chemical Biology, Kolkata, from 3.00 pm on 11th February, 2020.

A meeting of **Liaison Officers (Hindi)** of All Central Government Offices / Undertakings / Banks / Corporations / Bodies and Autonomous Organizations etc. was held under the aegis of All

India Institute of Health Sciences and Public Health, Kolkata from 2.30 pm on **06.02.2020** by **Hindi Teaching Scheme, Department of Official Language, Ministry of Home Affairs, Government of India, Kolkata** on Various programs of Hindi language, typing-stenography training to make it dynamic and effective. The meeting was attended by Shri Manoj Kumar Pandey, In-charge, Official Language Cell and Shri Prashant Tiwari, Official Language Officer.



Shri Anoop Kumar, Assistant Director (O.L.), Central Hindi Training Institute, Ministry of Home Affairs, Department of Official Language, Kolkata imparting training on Technical Workshop held at the Institute on December 13, 2020



Guest speaker Shri Rajesh Chaturvedi, Chief Manager (Official Language), State Bank of India, Kolkata imparting training on the implementation of Official Language to the workers of the Institute during the Hindi workshop held on December 20, 2019

## Delhi Centre

### 1. The Official Language Implementation Committee was formed in the Institute for the year 2019-20, which consists of the following members:

1. Prof. Sameer Kumar Niyogi, Head, Delhi Centre
2. Shri Pratyush Banerjee, Deputy Chief Executive
3. Shri S.A. Srinivas, Senior Administrative Officer
4. Smt. Simmi Marwah, Administrative Officer
5. Shri Lalan Singh, Senior Assistant
6. Shri Praveen Pandey, Senior Assistant
7. Shri Amardeep, Office Assistant 'B'

- President
- Member
- Member
- Member
- Member
- Member
- Member and Convenor

### 2. Official Language Implementation Committee Meetings:

During the year, 03 meetings of the Official Language Implementation Committee were held on 19.07.2019, 14.07.2019 and 29.11.2019, respectively, including organizing Hindi workshop, buying Unicode fonts for Hindi typing, considering the need of Hindi translator, Hindi Fortnight and Discussion on the jury, organizing competitions during vigilance pledge and any other pledge, discussing Hindi problem, discussion on Hindi translator and Hindi typist, discussion on Hindi website, discussion on words written on board, preparation of template, discussion on Hindi software, Ideas on bilingual phrases etc. topics were discussed.

### 3. Hindi Fortnight Events:

In the year 2019-2020 Hindi Pakhwara was celebrated from 16th September, 2019 to 30th September 2019. On 16.09.2019 at 10:15 am the inauguration ceremony was organized in the auditorium of the institute which was attended by all the Workers of the Institute. The Head of the Institute, Prof. Sameer Kumar Niyogi, lit the lamp and inaugurated the Hindi Pakhwada and congratulated everyone on Hindi Diwas and motivated on working in Hindi during all the year. Various competitions were organized during Hindi Pakhwada like Hindi Essay Competition, Hindi Extempore Competition, Hindi Translation Competition, Hindi Poetry Recitation Competition, Antakshari of Words, Quiz etc. Competitions. All the Institute

personnel participated vigorously in all these competitions. The number of contestants for all these competitions was kept at least seven. On 30.09.2019, the prize distribution and closing ceremony was organized. The Chairman presented the first, second and third prizes to all the winning contestants and congratulated to them for participation.

#### 4. Organizing Hindi Workshops:

**(A) 4th September 2019:** In this Workshop, Visiting Faculty Smt. Veena Sharma, who was invited from Central Hindi Training Institute, was called and the topic was discussed in the first hour of the workshop and an examination was taken in the second hour in which the winning participants were first,

second and third. In addition to the awards, the fourth award was given to other Hindi speakers as a consolation prize on the basis of performing well in Hindi workshop. About 25–30 personnel of the institute attended the workshops.

**(B) 13 December 2019:** In this Workshop, Visiting Faculty Shri Karan Singh was invited from Central Hindi Training Institute and the topic was discussed in the first hour of the workshop and in the second hour an examination was taken in which the winning participants were first, second and third. Apart from the awards, the fourth award was given to other Hindi speakers as a consolation prize on the basis of their outstanding performance in Hindi workshop. About 20–30 personnel of the institute attended the workshops.



Inauguration of Hindi Pakhwara by Prof. S.K. Neogy, Head, ISI, Delhi Centre



Participants in Hindi Pakhwara at ISI, Delhi

## Giridih Branch

The Official Language Implementation Committee was formed in the Institute for the year 2019-20, of following members:

1. Dr. Pradeep Bhattacharya, Head, Associate Professor	Chairman
2. Dr. Hari Charan Behera, Assistant Professor	Member
3. Dr. Abhishek Mukherjee, Associate Professor	Member
4. Shri Ganesh Tudu, Section Officer	Member and Convenor
5. Mr. Pradeep Ekka, Section Officer	Member
6. Mr. Ashok Kumar, Office Assistant C	Member
7. Md. Naqeeb Akhtar, Senior Assistant	Member
8. Md. Shamsul Huda, Office Assistant B	Member

On 18.09.2019 during Hindi Pakhwada, Hindi Song Singing Competition and Hindi Poetry Recitation Competition was organized by the Officers/ Employees of the branch in presence of Dr. Pradeep Bhattacharya, In-charge, Hindi Cell, Dr. Hari Charan Behera, In-Charge, Giridih Branch and Dr. Abhishek Mukherjee at Indian Statistical Institute Giridih.

## 8.10 Reports on various activities of the Institute

### A. Celebration of Independence Day

Indian Statistical Institute observed the 73rd Independence Day on 15th August, 2019 by hoisting the National Flag in the Institute premises. A cultural programme was also organized to celebrate the auspicious occasion, where the workers of the Institute with their families, research scholars, students, guests and dignitaries were present.



*Celebration of 73rd Independence Day at ISI, Head Quarters*

### B. Celebration of Republic Day

To celebrate the 70th Republic Day of India, the Institute workers with their families, research scholars, students, guests and dignitaries were present in the flag hoisting ceremony. Afterwards everybody also witnessed a cultural event, organized to grace the occasion.



*Celebration of the 70th Republic Day of India at ISI, Head Quarters*

### C. Celebration of Birth Anniversary of Prof. P. C. Mahalanobis

Indian Statistical Institute celebrated the 126th Birth Anniversary of Professor P.C. Mahalanobis on 29th June, 2019 as 'Workers' Day' and 'Statistics Day'. It was celebrated not only in the Headquarters but also in the other Centres with all the workers of the Institute with full sprit and enthusiasm.



*Celebration of 126th Birth Anniversary of Prof. P. C. Mahalanobis at ISI, Kolkata*



*Celebration of 126th Birth Anniversary of Prof. P. C. Mahalanobis at ISI, Hyderabad*

### D. Celebration of International Yoga Day

Indian Statistical Institute in association with ISI Club observed International Yoga Day on 21<sup>st</sup> June, 2019. Employees, Research Scholars, students, Project linked Personnel, Project trainee, ISI Co-Operative staffs, retired workers & Disha Service Co-operative Members participated in the event with great enthusiasm.



Celebration of International Yoga Day on 21<sup>st</sup> June, 2019 at ISI Kolkata

### E. Celebration of International Foundation Day

The 89th Foundation Day of the Institute was celebrated on 17<sup>th</sup> December, 2019 in the presence of Head of the Administration and the employees of the Institute. A Tree Plantation programme was observed to celebrate the occasion.



Tree Plantation by Director, ISI was observed to celebrate International Foundation Day



Tree Plantation by Prof. Sarbani Patranabis Deb, Geological Studies Unit, Kolkata was observed to celebrate International Foundation Day

### F. Felicitation of Bharat Ratna Shri Pranab Mukherjee, Hon'ble Former President of India

Indian Statistical Institute felicitated its former Chairman of ISI Council and Hon'ble former President of India, Bharat Ratna Shri Pranab Mukherjee on 11<sup>th</sup> December, 2019. The dignitaries, who were present on that day to grace the event, were Shri Jagdeep Dhankar, Hon'ble Governor of West Bengal, Shri Tapas Kumar Sanyal, DG (ES), Ministry of Statistics & Programme Implementation, Shri Bibek Debroy President of Indian Statistical Institute, Prof. Bimal Kumar Roy, Chairman, National Statistics Commission, Prof. Goutam Mukherjee, Dean of Studies ISI, and Prof. Sanghamitra Bandyopadhyay Director, ISI. The felicitation programme began with welcome address by the President of the Institute and ended with a vote of thanks by the Director of ISI. Library, Documentation and Information Science Division, ISI published a photo album entitled "Moments" in honor of Shri Pranab Mukherjee, which was released by him on the occasion.



Felicitated of Bharat Ratna Shri Pranab Mukherjee, Hon'ble Former President of India, by Director, ISI



Felicitated by Shri Bibek Debroy, President of ISI



Standing group photograph with our Hon'ble Ex-President Shri Pranab Mukherjee, Governor of West Bengal, Director, President of ISI & dignitaries

### F. Celebration of International Women's Day

The Institute celebrated International Women's Day on 8<sup>th</sup> March, 2020 at Platinum Jubilee Auditorium of the Institute in a grand way. It was attended by dignitaries like Smt. Alakananda Dey. The programme consisted of a Taekwondo Show and a drama named 'Begum Rokea'. The winners, of the photography contest, which was held to celebrate the International Women's Day, were also awarded during the programme.

### G. Birth Anniversary celebration of B.R. Ambedkar

Indian Statistical Institute alongwith the ISI SC/ST/BC Employees' Co-Ordination Council celebrated the 128<sup>th</sup> Birth Anniversary of Dr. Baba Saheb Ambedkar on 16<sup>th</sup> March, 2020. To mark the event, a seminar and cultural programme, was organized. Workers of the Institute participated in numbers to make the event successful.



Address by Dr. Neena Gupta, Stat-Math Unit, Kolkata on the occasion of International Women's Day at ISI, Kolkata



09

# Annual Accounts



## INDIAN STATISTICAL INSTITUTE

## Balance Sheet as at 31.03.2019

(Amount In Rupees)

PARTICULARS	SCHEDULE	CURRENT YEAR (2019-20)	PREVIOUS YEAR (2018-19)
<b>LIABILITIES</b>			
CORPUS/CAPITAL FUND	1	1,88,39,81,248	1,84,96,63,131
EARNMARKED /ENDOWMENT FUNDS	3	1,08,60,78,240	93,33,92,256
CURRENT LIABILITIES & PROVISION	7	45,91,37,400	50,66,41,993
LIABILITIES FOR FIXED ASSETS OF EXT. AIDED FUND		23,19,58,102	19,69,80,689
LIABILITIES FOR FIXED ASSETS OF ISEC FUND		11,67,659	7,32,894
LIABILITIES FOR FIXED ASSETS OF IGP PROJECT		75,70,523	71,13,633
<b>TOTAL</b>		<b>3,66,98,93,172</b>	<b>3,49,45,24,596</b>
<b>ASSETS</b>			
EARNMARKED / ENDOWMENT FUNDS	3	65,07,877	45,02,778
FIXED ASSESTS	8	2,02,24,04,179	1,91,39,55,500
INVESTMENT / ASSETS FROM EARMARKED/ EARMARKED/ENDOWMENT FUNDS	9	80,17,27,341	71,36,18,836
CURRENT ASSETS OF EXT. AIDED FUND	11	59,85,57,491	65,76,20,266
FIXED ASSETS OF EXT. AIDED FUND		23,19,58,102	19,69,80,689
FIXED ASSETS OF ISEC FUND		11,67,659	7,32,894
FIXED ASSETS OF IGP PROJECT		75,70,523	71,13,633
<b>TOTAL</b>		<b>3,66,98,93,172</b>	<b>3,49,45,24,596</b>
SIGNIFICANT ACCOUNTING POLICIES	24		
CONTINGENT LIABILITIES & NOTES ON ACCOUNTS	25		

Signed in terms of our Report of even date.

Place : Kolkata

Date: 18.12.2020

Sd/-

A Mukherjee/ S.K Chakraborty  
Dy.Chief Executive(F)

Sd/-

Brig J N Pandey  
Chief Executive (A&F)

Sd/-

Sanghamitra Bandyopadhyay  
Director

Sd/-

For K. S. Bothra & Co  
Chartered Accountants  
(Firm Registration No . 304084E)

Sandeep Kochar  
Partner

Membership No. 058892  
ICAI UDIN : 20058892AAAABG7529

## INDIAN STATISTICAL INSTITUTE

## Income &amp; Expenditure Account for the Year Ended 31.03.2019

(Amount in Rupees)

PARTICULARS	SCHEDULE	CURRENT YEAR (2019-20)		PREVIOUS YEAR (2018-19)	
		GRANT SALARY	GRANT GENERAL	GRANT SALARY	GRANT GENERAL
<b>INCOME</b>					
MISCELLANEOUS RECEIPTS	<b>12</b>	0	9,45,51,134	0	7,25,20,616
GRANT IN AID FROM GOVT OF INDIA	<b>13</b>	217,07,46,349	29,44,32,951	251,96,42,536	22,40,69,752
<b>TOTAL (A)</b>		<b>217,07,46,349</b>	<b>38,89,84,085</b>	<b>251,96,42,536</b>	<b>29,65,90,368</b>
<b>EXPENDITURE</b>					
ESTABLISHMENT EXPENSES	<b>20</b>	249,01,37,286	0	257,72,43,187	0
OTHER ADMINISTRATIVE EXPENSES	<b>21</b>	0	30,16,83,976	0	29,24,62,418
<b>TOTAL(B)</b>		<b>249,01,37,286</b>	<b>30,16,83,976</b>	<b>257,72,43,187</b>	<b>29,24,62,418</b>
BALANCE BEING SURPLUS / (DEFICIT ) [A-B]		-31,93,90,937	8,73,00,109	-5,76,00,651	41,27,950
CARRIED TO CORPUS/ CAPITAL			-23,20,90,829	-5,34,72,701	
SIGNIFICANT ACCOUNTING POLICIES	<b>24</b>				
CONTINGENT LIABILITIES & NOTES ON ACCOUNTS	<b>25</b>				

Signed in terms of our Report of even date.

Place : Kolkata

Date: 18.12.2020

Sd/-

A Mukherjee/ S.K Chakraborty  
Dy.Chief Executive(F)

Sd/-

Brig J N Pandey  
Chief Executive (A&F)

Sd/-

Sanghamitra Bandyopadhyay  
Director

Sd/-

For K. S. Bothra & Co  
Chartered Accountants  
(Firm Registration No . 304084E)Sandeep Kochar  
PartnerMembership No. 058892  
ICAI UDIN : 20058892AAAABG7529

## INDIAN STATISTICAL INSTITUTE

## Capital Utilization Statement for the Year Ended 31.03.2020

(Amount in Rupees)

PARTICULARS	CURRENT YEAR (2019-20)	PREVIOUS YEAR (2018-19)
GRANT RECEIVED FOR CREATION OF CAPITAL ASSETS (INCL C/F OF PREVIOUS YEAR)	31,52,21,705.00	40,15,76,000
<b>TOTAL(A)</b>	<b>31,52,21,705.00</b>	<b>40,15,76,000</b>
EXPENDITURE ON CREATION OF CAPITAL ASSETS	22,09,97,431.80	41,18,39,295
<b>TOTAL(B)</b>	<b>22,09,97,432.00</b>	<b>41,18,39,295</b>
<b>NET BALANCE(A-B)</b>	<b>9,42,24,273</b>	<b>-1,02,63,295</b>

Place : Kolkata

Signed in terms of our Report of even date.

Date: 18.12.2020

Sd/-

A Mukherjee/ S.K Chakraborty  
Dy.Chief Executive(F)

Sd/-

Brig J N Pandey  
Chief Executive (A&F)

Sd/-

Sanghamitra Bandyopadhyay  
Director

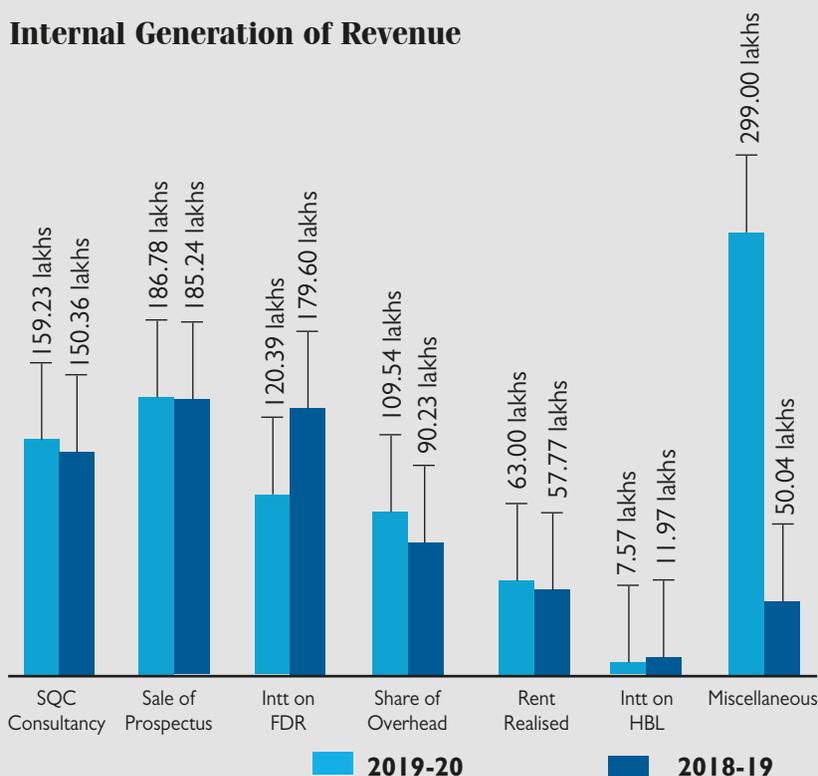
Sd/-

For K. S. Bothra & Co  
Chartered Accountants  
(Firm Registration No . 304084E)

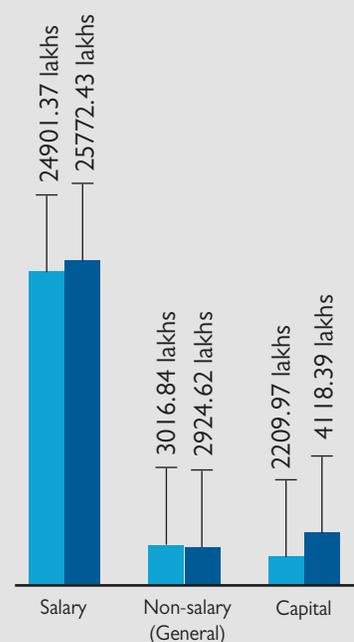
Sandeep Kochar  
Partner  
Membership No. 058892  
ICAI UDIN : 20058892AAAABG7529

## Internal Generation of Revenue

AT A GLANCE



## Expenditures





$\frac{1}{2} a \cdot t^2$    $v = \pi r^2 \cdot h$   $f = \frac{R}{2}$   $\sin \alpha = \frac{a}{c}$   $\epsilon = n$   
 $U = \epsilon \cdot d$   $v = h \cdot n$   $\sigma = h \cdot n$   $\vec{v} = \frac{\Delta \vec{r}}{\Delta t}$   $f = \frac{1}{T}$   $s =$   
 $J = I \cdot \omega$   $v = abh$   $C_p = C_v + R$   $\rho = \frac{m}{V}$   $\lambda = v \cdot T$   $R$   
 $v = \frac{4}{3} \pi r^3$   $W = -p \cdot \Delta V$   $\vec{F}_s = -k \cdot \vec{x}$   $\omega = \frac{\Delta \alpha}{\Delta t}$   
 $U = \epsilon \cdot d$   $v = P \cdot h$   $\Delta U = Q + W$    $R_2 = 6370 \text{ km}$   
 $p + q = 1$   $\lambda = \frac{h}{m \cdot v}$    $\sigma = \omega \cdot r$   $a^2 + b^2 = c^2$   
 $W = -p \cdot \Delta V$   $v = abh$   
 $W = \frac{1}{2} Q \cdot U = \frac{1}{2} C \cdot U^2$   $\sigma_1 = \sqrt{\frac{G \cdot M_2}{R_2}} = 7.9 \text{ km/s}$   
 $T = 2\pi \sqrt{\frac{l}{g}}$   $J = I \cdot \omega$   $\frac{T_1^2}{R_1^3} = \frac{T_2^2}{R_2^3} = \text{const}$   $p = \frac{F}{S}$   
 $\epsilon = m \cdot c^2$   $I = \sum_{i=1}^n m_i \cdot r_i^2$   $T = 2\pi \sqrt{\frac{I}{Mg}}$   
 $g = 9.81 \frac{m}{s^2}$   $R_2 = 6370 \text{ km}$   
 $\frac{1}{2} a \cdot t^2$   $f = \frac{R}{2}$   $v = \frac{4}{3} \pi r^3$   $f = \frac{R}{2}$   $\sin \alpha = \frac{a}{c}$   
 $W = -p \cdot \Delta V$   $g = 9.81 \frac{m}{s^2}$   
 $U = \epsilon \cdot d$   $U = \epsilon \cdot d$   $v = h \cdot n$   $\vec{v} = \frac{\Delta \vec{r}}{\Delta t}$   $f = \frac{1}{T}$   
 $J = I \cdot \omega$   $C_p = C_v + R$   $\lambda = v \cdot T$   
 $v = \frac{4}{3} \pi r^3$   $\vec{F}_s = -k \cdot \vec{x}$   $\rho = \frac{m}{V}$   $\omega = \frac{\Delta \alpha}{\Delta t}$   
 $U = \epsilon \cdot d$   $v = P \cdot h$   $\Delta U = Q + W$    $R_2 = 6370 \text{ km}$   
 $p + q = 1$   $\lambda = \frac{h}{m \cdot v}$   $\sigma = \omega \cdot r$   $a^2 + b^2 = c^2$   
 $W = -p \cdot \Delta V$   $v = abh$   
 $W = \frac{1}{2} Q \cdot U = \frac{1}{2} C \cdot U^2$   $\sigma_1 = \sqrt{\frac{G \cdot M_2}{R_2}} = 7.9 \text{ km/s}$   
 $T = 2\pi \sqrt{\frac{l}{g}}$   $J = I \cdot \omega$   $\frac{T_1^2}{R_1^3} = \frac{T_2^2}{R_2^3} = \text{const}$



**INDIAN STATISTICAL INSTITUTE**

203, Barrackpore Trunk Road, Kolkata - 700108  
<http://www.isical.ac.in>