AN INTRODUCTION TO CRYSTALLIZATION THEORY

A simplicial cell complex K of dimension d is a poset isomorphic to the face poset of a d-dimensional simplicial CW-complex X. If a topological space M is homeomorphic to X, then K is said to be a pseudotriangulation of M. In 1974, Pezzana proved that every connected closed PL d-manifold admits a (d+1)-vertex pseudotriangulation. For such a pseudotriangulation of a PL d-manifold one can associate a (d + 1)-regular colored graph, called a crystallization of the manifold. Actually, crystallization is a graph-theoretical tool to study topological and combinatorial properties of PL manifolds. In this talk, I shall define crystallization and show some applications on PL d-Manifolds for d = 2, 3 and 4. In dimension 2, I shall show a proof of the classification of closed surfaces using crystallization. This concept has some important higher dimensional analogs, especially in dimensions 3 and 4. In dimensions 3 and 4, I shall give lower bounds for facets in a pseudotriangulation of a PL manifolds. Also, I shall talk on the regular genus (a higher dimensional analog of genus) of PL d-manifolds. Then I shall show the importance of the regular genus in dimension 4. Additivity of regular genus has been proved for a huge class of PL 4-manifolds. We have some observations on the regular genus, which is related to the 4-dimensional Smooth Poincar´e Conjecture.

by Dr. Biplab Basak
Stat Math Unit, Indian Statistical Institute, Kolkata.

WHEN
September 07, 2018 (Friday)
4 PM
WHERE
Seminar Hall, ISI NE Centre,
(inside Tezpur University campus)

ALL ARE CORDIALLY INVITED

Indian Statistical Institute
North-East Centre
Tezpur, Assam

ISI NE Colloquy hopes to engage minds in academic discourses pertaining to a gamut of theoretical and applied disciplines.

It envisions to host brainstorming sessions with stimulation from experts and scholars.