

## ICTS Seminar

- Title : Consequences of Integrable Representations on Phases of Chern-Simons Theory on  $S^3$
- Speaker : Arghya Chattopadhyay, Indian Institute of Science Education and Research, Bhopal
- Date : Friday, 30th November, 2018
- Time : 2:30 PM
- Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore
- Abstract : Ongoing Work With : Suvankar Dutta(IISER Bhopal), Neetu(IISER Bhopal)  
Partition function for Chern-Simons(CS) theory on  $S^3$  (or any Seifert manifold) with a gauge group  $G$  and level  $K$  can be written as a sum over integrable representations of the corresponding affine Lie algebra of the boundary Wess-Zumino-Witten Model. We consider the partition function for  $U(N)$  Chern-Simons theory with level  $K$  written as a sum over Integrable representation(for odd  $K$ ), and show that the restriction over representation dictates a novel phase transition after a particular value of the corresponding 't Hooft coupling. For small coupling the dominant representations are characterised by Young diagrams with number of boxes on the top-most row being less than the level  $K$ . On the other hand after a critical value of the coupling, the dominant representations are always characterised by Young diagrams with exact  $K$  number of boxes on the topmost row. This new phase is same in spirit as a no gap phase in the Young diagram side and a cap-gap phase in the eigenvalue side.