



Indian Institute of Science Education and Research Mohali

Foundation Day Lecture September 27, 2022

Programme:

- 3:45 pm Welcome by Dean R&D
- 3:47 pm Release of Annual Report 2021-22
- 3:48 pm Welcome Address (Director, IISER Mohali)
- 3:58 pm Introduction of the Chief Guest
- 4:00 pm “200 Years of Studies of Phase Transitions”**
by Professor Deepak Dhar, IISER Pune
- 5:10 pm Prize Distribution
- 5:20 pm Vote of Thanks (Associate Dean R&D)
- 5:30 pm High Tea

All are Welcome

Venue:

LH-7 (Auditorium), Lecture Hall Complex, IISER Mohali, Sector 81,
Knowledge City, SAS Nagar, Manauli (PO), Punjab - 140306



Indian Institute of Science Education and Research Mohali

Foundation Day Lecture

Date: September 27, 2022 at 4:00 pm

Venue: LH-7, Lecture Hall Complex, IISER Mohali

Speaker: Professor Deepak Dhar, IISER Pune

Title: “200 Years of Studies of Phase Transitions”



Abstract:

The scientific study of phase transitions may be said to have begun with the demonstration of continuity of the liquid and gaseous states at high temperatures by Cagniard de la Tour in 1822. In this talk, I will present a personal perspective about its status after 200 years. Our understanding of continuous phase transitions is pretty good by now. The scaling theories of Widom, Fisher and Kadanoff have led to the understanding of critical phenomena in the framework of the renormalization group theory. But we still do not have simple tractable models that show the solid to liquid to gas phase transitions. First order transitions, and other transitions like the glass transition are still not understood as well. I will discuss the Lee-Yang theory of phase transitions in terms of the zeros of the partition function in the complex activity plane, and mention some of my recent work on phase transitions in systems with only hard-core interactions.

About the Speaker:

Professor Deepak Dhar obtained his BSc degree from the University of Allahabad, Masters from IIT Kanpur, and PhD in Physics from California Institute of Technology. From 1978-2016, he was in the Department of Theoretical Physics at TIFR Mumbai, and been at IISER Pune since November 2016. Professor Dhar's interest is in Statistical Physics. His current research interests are mainly in phase transitions in phase transitions with only hard-core interactions. The phase transition in a system of hard spheres as a function of density from a gas like to a solid -like crystalline phase have been studied for a long time. He has studied lattice models of long straight rods of fixed length k (called kmers) show two phase transitions: from isotropic to nematic to a high-density disordered phase. Professor Dhar is an elected Fellow of Indian Academy of Sciences (IAS), Indian National Science Academy (INSA), National Academy of Sciences, Allahabad and Third World Academy of Sciences (TWAS), Trieste. He is a recipient of many prestigious national and international awards such as INSA Young Scientist (1983), S. S. Bhatnagar award (1991), J.R. Schrieffer Prize in Condensed Matter Physics (1993) and S. N. Bose Medal (2001). He was a J. C. Bose Fellow during 2007-2017. He also served as a member of International Union of Pure and Applied Physics (IUPAP) Commission on Statistical Physics during 1992-95. Recently, he has been awarded the Boltzmann Medal along with John J. Hoefield of Princeton University by the Commission on Statistical Physics of the IUPAP. Professor Dhar is the first Indian to bag this prestigious award. Currently, he is working at IISER Pune as NASI Senior Scientist and Distinguished Emeritus Professor.