

ICTS Skype Seminar

Title : Effect of disorder on the percolation transition

Speaker : Sumanta Kundu, Satyendra Nath Bose National Centre for Basic Sciences, Kolkata

Date : Monday, January 7, 2019

Time : 10:00 AM

Venue : Amal Raychaudhuri Meeting Room, ICTS Campus, Bangalore

Abstract : Percolation transition signifies the emergence of large-scale connectivity from the short-range connectedness. We address how different sources of disorder which influences the small-scale connectivity, affect the percolation properties of the system. Occupying randomly the sites of a lattice with probability p by circular disks with uniformly distributed radii, we find that the percolation threshold p_c varies continuously within $p \leq p_c \leq 1$, where p_c is the site percolation threshold of the lattice. Further, considering pulsating disks with random phase angles and tuning the maximal radius of the disks, two distinct percolation transitions have been observed. In another model, we randomly occupy the sites by different colors and define connectivity through neighboring dissimilar colors. Estimation of several critical exponents in these models leads us to conclude that although percolation thresholds are dependent on the sources of disorder, the percolation transitions always fall into the ordinary percolation universality class.