

## **SEMINAR NOTICE**

**On 14<sup>th</sup> March (Monday), 2022**

**Time: 12:00 PM (Noon)**

**VENUE- PAMU Seminar Room (offline)**

Physics and Applied Mathematics Unit  
Indian Statistical Institute, Kolkata- 700108

**Speaker: PROF. MD. KAMRUL HASSAN**

*Theoretical Physics Group, Department of Physics, University of Dhaka, Dhaka 1000,  
Bangladesh*

**TITLE:** Understanding multifractal, scale-free and small world weighted planar stochastic lattice.

**ABSTRACT:** In this talk, we will discuss a class of weighted planar stochastic lattice (WPSL1) created by random sequential nucleation of seed from which a crack is grown parallel to one of the sides of the chosen block and ceases to grow upon hitting another crack. It results in the partitioning of the square into contiguous and non-overlapping blocks. Interestingly, we find that the dynamics of WPSL1 is governed by infinitely many conservation laws and each of the conserved quantities, except the trivial conservation of total mass or area, is a multifractal measure. On the other hand, the dual of the lattice is a scale-free network as its degree distribution exhibits a power-law. The network is also a small-world network as we find that (i) the total clustering coefficient  $C$  is high and independent of the network size and (ii) the mean geodesic path length grows logarithmically with  $N$ . Besides, the clustering coefficient of the nodes which have degree  $k$  decreases exactly as  $2/(k - 1)$  revealing that it is also a nested hierarchical network.

**All are Cordially Invited to Attend**

(Head, PAMU)