

## **THE LORENTZIAN SCATTERING RIGIDITY PROBLEM AND RIGIDITY OF STATIONARY METRICS**

**Speaker: Plamen Stefanov**  
**Purdue University**

**Time: Fri, May. 12, 9:00-10:00**

**Venue: Zoom: 618-038-6257, Password: SCMS**

**Abstract:** We study scattering rigidity in Lorentzian geometry: recovery of a Lorentzian metric from the scattering relation known on a lateral boundary. We show that, under a non-conjugacy assumption, every defining function  $r(x,y)$  of the submanifold of pairs of boundary points which can be connected by a lightlike geodesic plays the role of the boundary distance function in the Riemannian case in the following sense. Its linearization is the light ray transform of tensor fields of order two which are the perturbations of the metric. Next, we study scattering rigidity of stationary metrics in time-space cylinders and show that it can be reduced to boundary rigidity of magnetic systems on the base; a problem studied previously. This implies several scattering rigidity results for stationary metrics.