BOSE COLLOQUIUM

23 February 2015   **4:00 p.m.**   **Fermion**

Speaker:
Prof. Phoolan Prasad
Department of Mathematics
Indian Institute of Science, Bangalore

Title:
Question of Equivalence of Huygens' and Fermat's Methods of Wavefront Construction

Abstract:

According to Fermat's principle, a ray going from one point P0 to another point P1 in space chooses a path such that the time of transit is stationary. Given initial position of a wavefront 0, we can use rays to construct the wavefront 1 at any time t1. Huygens' method states that all points of a wavefront 0 at t = 0 can be considered as point sources of spherical secondary wavelets and after time t1 the new position 1 of the wavefront is an envelope of these secondary wavelets. The equivalence of the two methods of construction of a wavefront t in an isotropic medium is too well known but not proved in a medium governed by a general hyperbolic system of equations. We shall discuss this still open problem for a general hyperbolic system and prove a part of the equivalence for a particular case when the medium is governed by Euler equations of a polytropic gas.