

## ASTROPHYSICS SEMINAR SERIES

### **Numerical Studies of sub-Keplerian Accretion Disk onto Black Holes**

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12:30 pm - Rm 184 NSH

Two component advective flow (TCAF) model is quite successful in explaining the spectral and timing properties of the accretion disk around black holes. The sub-Keplerian flow is an important component of TCAF model because it is responsible for producing the observed hard radiation in this model. Theoretical calculations predict that as the sub-Keplerian matter approaches the black holes, it slows down due to centrifugal force and sometimes, a shock may form. In the post-shock region, the sub-Keplerian matter mixes up with a Keplerian component and an optically slim (optical depth  $\sim 1$ ) disk is formed. Because of the shock, this region becomes hotter too. It is believed that the soft photons from the Keplerian disk get inverse-Comptonized in this post-shock region and leave the system as hard radiations (Chakrabarti & Titarchuk 1995). In this talk, we shall present results of our numerical experiments of the sub-Keplerian component proving that the formation of the shock is indeed possible under various circumstances. I shall also present some simulation results showing how such disk can explain the observed radiations from the black hole binaries. Finally, I shall present our new simulation technique on Geodesic Mesh and present a few 3D simulation results of the sub-Keplerian disk.



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