
The Virginia Tech Physics Department presents the following colloquium:

Dr. Jimmy Irwin (University of Michigan)

*“Extragalactic X-ray Binary Stars: Beacons for
Stellar- and Intermediate-Mass Black Holes”*

Abstract:

X-ray binaries have a compact primary star (either a black hole or a neutron star) accreting material from a normal secondary donor star, and this mass transfer process generates copious amounts of X-ray emission. For decades X-ray binary stars in the Milky Way have taught us a great deal about the physics of accretion onto compact objects. However, the limited number of X-ray binaries in the Milky Way has set constraints on our progress in understanding black hole binary formation and evolution. Furthermore, only a small percentage of Milky Way X-ray binaries are accreting near the maximum rate allowed before radiation pressure begins to limit the supply of additional material onto the compact object, making it difficult to study accretion in the crucial high mass transfer rate regime. Fortunately, the Chandra and XMM-Newton X-ray observatories are overcoming these limitations and now we have studied large numbers of X-ray binaries in nearby galaxies, many of which are accreting near their maximum limit. In this talk, I will discuss how these data have provided enormous insight into the formation of X-ray binaries. In addition, I will present evidence that the most luminous X-ray binaries may best be explained by accretion onto "intermediate" mass black holes. Such black holes, intermediate in mass between stellar-sized black holes and supermassive black holes at the centers of galaxies, would greatly challenge our notions of black hole formation, since there are no widely accepted theoretical models of how black holes in this mass range can form.

Friday, March 16
2:30 P.M.
210 Robeson Hall

