

Chris Kochanek – Colloquium 9/27/2018

Title: In Search Of: The Formation of a Black Hole

Abstract: There is no reason to think that all massive stars that undergo core collapse become supernovae. In fact, in most modern theoretical studies, some tens of percent collapse to produce black holes without a supernova explosion. This would also naturally explain the masses of Galactic black holes and the apparent absence of the most massive red supergiants as supernova progenitors. I describe an observational search for such "failed supernovae" using the Large Binocular Telescope and the properties of the survey's first candidate. The estimated mass of the candidate is typical of stars expected not to explode, and the implied rate is consistent with theoretical expectations. At present, our approach is the only means of searching for black hole formation short of an event in our own Galaxy.