

Samaresh Mondal - The connection between ultra-luminous X-ray sources and double compact objects.

Wednesday, 12 June 2019 11:10 (20 minutes)

We explore the different formation channels of merging double compact objects (DCOs: BH-BH/BH-NS/NS-NS) that went through an ULX phase (X-ray sources with luminosity exceeding the Eddington luminosity of a $10 M_{\odot}$ black hole). There are two major formation channels which can naturally explain the formation of DCO systems: isolated binary evolution and dynamical evolution inside dense clusters. It is not clear which channel is responsible for (majority/all) LIGO/Virgo sources. Finding connections between ULXs and DCOs can potentially point to the origin of merging DCOs as more and more ULX are being discovered.

We use the StarTrack population synthesis code to show how many of the observed ULXs may form merging DCOs in the framework of binary evolution. We find that in the local universe as many as $\sim 50\%$ of merging DCO progenitor binaries have evolved through an ULX phase. This shows that ULXs can be used to study the origin of LIGO/Virgo sources.

Primary author: Mr MONDAL, Samaresh (Nicolaus Copernicus Astronomical Center, Polish Academy of Sciences, ul. Bartycka 18, 00-716 Warsaw, Poland)

Co-authors: Prof. BELCZYNSKI, Krzysztof (Nicolaus Copernicus Astronomical Center, Polish Academy of Sciences, ul. Bartycka 18, 00-716 Warsaw, Poland); Prof. LASOTA, Jean-Pierre (Institut d'Astrophysique de Paris, CNRS et Sorbonne Universite, UMR 7095, 98bis Bd Arago, 75014 Paris, France); Prof. KING, Andrew (Theoretical Astrophysics Group, Department of Physics and Astronomy, University of Leicester, Leicester LE1 7RH, UK)