

Speaker: Prof. Kailash C Sahu, Emeritus Astronomer, Space Telescope Science Institute, Baltimore and Honorary Senior Professor, Indian Centre for Space Physics, Kolkata

Title: Search for and discovery of isolated black holes using Hubble Space Telescope

Abstract: We recently detected an isolated stellar-mass black hole unambiguously for the first time, and measured its mass, distance and velocity. We used Hubble to carry out precise astrometry of the source star of the long-duration, high-magnification microlensing event OGLE-11-462. Combining HST astrometry, OGLE photometry, and spectroscopic measurements, we obtain a lens mass of ~ 7 solar mass and a distance of ~ 1.6 kpc. The lens emits no detectable light, which confirms that it's indeed a black hole. Its proper motion is offset from the mean motion of Galactic-disk stars at similar distances by ~ 45 km/s, suggesting that the black hole received a natal kick from its supernova explosion. Our mass measurement is the first ever for an isolated stellar-mass black hole using any technique. The implications of this detection and the status of our ongoing program will be discussed. Future telescopes such as Roman should be able to detect a large number of such isolated black holes.

Venue: SS Dikpati Hall

Time: 8 Oct 2026 at 4:00 PM