

Institute Colloquium

Kailash C. Sahu (Space Telescope Science Institute, Baltimore, USA)

About the Speaker: *Dr. Sahu is an astronomer at the Space Telescope Science Institute, and an instrument scientist for HST. His research efforts have focused on applying microlensing, transit, and relativistic deflection techniques to detect and study exoplanets, nearby stars and black holes. He currently leads two HST projects to detect isolated, stellar-mass black holes and determine their masses through gravitational lensing.*



28th October 2024

05:00 PM

Venue: LH3

Discovering Isolated Stellar-Mass Black Holes through Relativistic Deflection

There are about 100 million black holes in our Galaxy, a large fraction of which are freely floating in interstellar space without any stellar companion. Yet, not a single isolated black hole had ever been detected to date. Relativistic deflection offers a powerful, and the only technique capable of detecting isolated black holes. However, the expected deflection is extremely small and can be measured only through large space-based telescopes. We used Hubble Space Telescope to precisely measure the relativistic deflection caused by a black hole as it lensed and deflected the light of a background star. The superb astrometric capability of Hubble Space Telescope allowed us for the first time to measure the deflection caused by a black hole, and thereby measure its mass. Our measured mass of 7 solar mass, coupled with the fact that it emits no light confirmed its black hole nature. The implications of this discovery and the status of our ongoing program will be discussed. Future space telescopes should detect a large number of such isolated black holes.
