Revealing The Hidden Universe With Black Hole Mergers

Prof. Manuela Campanelli- Rochester Institute of Technology

Distinguished Lecture on Astronomy

Open to the public, free admission

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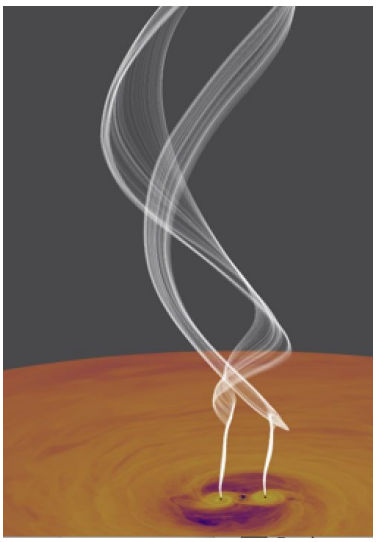
Arecibo Observatory - Visitor Center



Abstract:

The recent discoveries of gravitational waves from several binary black hole mergers **(including the 2017 Nobel prize-winning discovery)** and a neutron star merger by the advanced LIGO and Virgo detectors are giving us the first glimpses of the hidden side of the universe. In the next decade, the detection of low frequency gravitational waves by the PTA and LISA projects will unveil the mystery of merging supermassive black holes at the center of galaxies. I will present here new sophisticated simulations indicating that supermassive binary black hole sources might indeed be detectable in the electromagnetic spectrum in the not too distant future. By so doing, we will give observers strong clues about how to find such systems, potentially identifying examples well before their gravitational wave emission can be detected.

About the speaker:

Manuela Campanelli is a professor of Mathematics and Astrophysics at the Rochester Institute of Technology. She is the director of the Center for Computational Relativity and Gravitation. Campanelli was the recipient of the Marie Curie Fellowship (1998), the American Physical Society Fellowship (2009) and the RIT Trustee Award (2014). She was also the Chair of the APS Topical Group in Gravitation in 2013. She is a member of the LIGO scientific collaboration. Dr. Campanelli has an extensive research experience on Einstein's theory of General Relativity, astrophysics of black holes and gravitational waves. She is known for groundbreaking work on numerical simulations of binary black hole space times and for explorations of physical effects such as "super kicks" and spin-driven orbital dynamics. Her most recent research focuses on supermassive binary black hole mergers, and on magnetohydrodynamics simulations of their accretion disk and jet dynamics, in connection with both gravitational-wave and electromagnetic observations.