Sacramento State Department of Physics and Astronomy

Thursday, February 4, 2020 | 4:00pm – 5:20pm

Please, visit csus.edu/physics for more information on how to access the colloquium virtually.
Open and free to all students, faculty and public.

The Renaissance of Astrophysics: a landscape of opportunities in the era of Time Domain Multi-Messenger investigations

Raffaella Margutti
Associate Professor
Northwestern University

Astronomical transients are signposts of catastrophic events in space, including the most extreme stellar deaths, stellar tidal disruptions by supermassive black holes, and mergers of compact objects. Thanks to new and improved observational facilities we can now sample the night sky with unprecedented temporal cadence and sensitivity across the electromagnetic spectrum and beyond. This effort has led to the discovery of new types of astronomical transients, revolutionized our understanding of phenomena that we thought we already knew, and enabled the first insights into the physics of neutron star mergers with gravitational waves and light. In this talk I will review some very recent developments that resulted from our capability to acquire a truly panchromatic view of transient astrophysical phenomena. I will focus on two key areas of ignorance in the field: (i) What are the progenitors of stellar explosions and what happens in the last centuries before death? (ii) What is the nature of the compact objects produced by these explosions and what happens when compact objects merge? The unique combination of Discovery Power (guaranteed by planned transient surveys like LSST, combined with efforts in the realm of artificial intelligence) and Understanding (enabled by multi-messenger observations) is what positions time-domain astrophysics for major advances in the near future.

Event supported by the National Science Foundation.

NSF

SACRAMENTO STATE