3rd URSI AT-AP-RASC, Gran Canaria, 29 May – 3 June 2022

Recent Discoveries in Late-Time Radio Emission from Tidal Disruption Events (TDEs)

Yvette N. Cendes[(1)]
(1) Center for Astrophysics | Harvard & Smithsonian, Cambridge, MA 02138, USA, e-mail: yvette.cendes@cfa.harvard.edu

A tidal disruption event (TDE) occurs when a star wanders sufficiently close to a supermassive black hole (SMBH) to be torn apart by tidal forces. TDE observations in radio offer a unique laboratory to measure SMBH masses, to study super-Eddington accretion and associated outflows related to the stellar disruption, and to probe the environment around previously dormant SMBHs. To date, radio TDEs indicate surprisingly diverse properties, with different rise times and evolution between different events. However, when emission is not detected in TDEs at early times, there has been a lack of sensitive systematic follow-up of TDEs at later epochs.

Recently, however, it has become apparent that some TDEs can exhibit a delayed onset of radio emission, which may be due to long-elusive off-axis relativistic jets, or to a previously unknown delayed phase of TDE accretion and outflows. In this talk, I will discuss results from a radio survey of ~25 TDEs over 2 years post-disruption using the Very Large Array (VLA) in the USA, MeerKAT in South Africa, and the Giant Metrewave Radio Telescope (GMRT) in India. Al of these TDEs were discovered at optical wavelengths, and did not exhibit radio emission at early times. I will discuss the rate of radio-bright TDEs at late times, their associated energies, and the implications for the density profile surrounding SMBHs. I will also discuss briefly some of the multi-wavelength properties of our sample observed in optical and X-ray wavelengths, their host galaxies and what this can tell us about late-time radio TDE emission.