

Title:

Dark matter and pulsars at the Galactic centre: innate similarities disentangled through a multiwavelength approach

Abstract:

The Galactic Centre harbours a dense and dynamic environment where dark matter and astrophysical processes can produce overlapping signals that challenge our ability to disentangle their origins. Chief among these is the *Fermi*-LAT gamma-ray excess, whose spectral and spatial features appear strikingly compatible with both annihilating dark matter and a population of unresolved millisecond pulsars in the Galactic bulge. This innate similarity has sparked intense debate over the past decade. In this talk, I will explore how a coordinated multiwavelength approach—combining gamma-ray data with X-ray and radio observations—is helping to resolve this degeneracy. I will highlight recent progress in deep radio searches for pulsars, the constraints they impose on source populations, and the implications for dark matter interpretations. I will also discuss how data-driven techniques and upcoming survey facilities are poised to sharpen our view of the Galactic centre and bring us closer to unveiling the true nature of the gamma-ray excess.