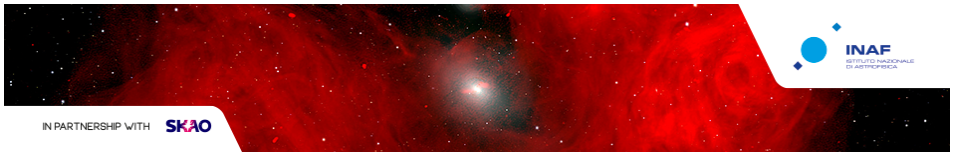

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Isolated black holes and neutron stars in the Galaxy

Thursday, 30 November 2023 14:30 (25 minutes)

It is believed that about $10^8 - 10^9$ old neutron stars and a comparable number of stellar mass black holes are present in the Milky Way. While isolated neutron stars can be detected as rotation-powered pulsars if young and energetic enough, or, less frequently, as thermal X-ray emitters, isolated black holes have up to now escaped firm detection. Our knowledge of stellar mass black holes is mostly based on those found in X-ray binary systems, where accretion from a companion star makes them visible. Recently, astrometric gravitational microlensing techniques have led to the discovery of a few isolated black hole candidates (one of which confirmed by different groups), and many more are expected in the coming years with the advent of new facilities, such as the Roman Space Telescope.
Isolated black holes and neutron stars are expected to accrete at low rates from the interstellar medium. Theoretical models, as well as the evidence based on radio observations of X-ray binaries, indicate that the radio band offers the best detection prospects for compact objects with small accretion rates.
The high sensitivity, spatial resolution and wide sky coverage provided by SKA will be crucial to confirm and study isolated black holes and neutron stars found with microlensing, as well as to independently discover new members of these classes.
I will review the current status and discuss how SKA, in synergy with multi-wavelength data from other facilities, can contribute to this field.

Reasearch area

Pulsars

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