

Radio galaxies and supermassive black holes in XXL-North

Projektet kan utföras på svenska.

Bild: [Se separat fil](#)

Bakgrund

We are involved in XXL, an international collaboration centered on an extensive X-ray program with the XMM-Newton satellite. Two areas of the sky (of 25 square degrees each) have been surveyed across the entire electromagnetic spectrum using ground-based and space-borne telescopes. So far, the 365 brightest clusters of galaxies and the 26 000 brightest Active Galactic Nuclei (AGN) have been identified. AGN are powered by material accreted onto black holes at the centers of galaxies. The XXL dataset, because of its completeness and multiwavelength coverage, is a goldmine for extragalactic and cosmological studies.

Problembeskrivning

The goal is to study powerful radio galaxies in the northern field of XXL, XXL-North. High-quality images obtained with the Giant Metrewave Radio Telescope in India are available. The emission is produced by relativistic electrons spiraling along magnetic field lines. The focus will be on extended sources with diffuse radio lobes. Those lobes are fed by jets emanating from the central black hole and extend to several hundreds of kpc (1 kpc is about 3 000 lightyears), well beyond the host galaxy. What happens in the galactic nuclei? How do the radio lobes interact with the hot (100 million K) X-ray emitting surrounding medium?

Arbetsätt

The work will involve a characterization of a few well-selected sources in XXL-North. The study will not be limited to the radio data but will exploit the multiwavelength nature of XXL to learn about the physical processes in AGN and radio galaxies.

Gruppstorlek

3–4 studenter

Målgrupp

E, F, GU-Fysik

Litteraturtips

The XXL survey: <http://sci.esa.int/xmm-newton/60686-tracing-the-universe-x-ray-survey-supports-standard-cosmological-model/>

Article that grew of a kandidatarbete in 2017 (the figure taken from this article):

<http://adsabs.harvard.edu/abs/2018arXiv180708653H>

Handledare

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