

## Radio Search of Dark Matter

*Saturday, 13 December 2025 11:30 (30 minutes)*

Dark matter is the dominant matter in the Universe while its particle nature is still unknown. In this talk, I will introduce two major scenarios of dark matter: Axion dark matter and WIMP (Weakly Interactive Massive Particle) and show how radio telescopes can search and put constraints on their parameters. The first one is Axion, which is a compelling dark matter candidate of increasing scientific interests in recent years, and was originally postulated to solve the strong CP problem in particle physics. Axions can be converted into monochromatic radiation in the neutron star's magnetosphere, constituting a unique window to probe its existence with a radio telescope. We used MeerKAT telescope to constrain the Axion DM decay rate from an isolated neutron stars. In addition, we used the recent Pulsar Polarization Array data to constrain the Ultra Light Dark Matter (ULDM) dark matter candidate. For WIMP, we used China FAST telescope to observe the synchrotron emission of WIMP dark matter decay in COMA Berenices dwarf galaxy and obtained strong constraints on WIMP decay channels. I will analyze these current results and give future prospects on using radio telescope to constrain dark matter.

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**Session Classification:** Plenary session