Probing ALP dark matter through polarisation measurements towards a gravitational lensing galaxy.

Presence of dark matter in our Universe has been well established by astrophysical measurements. However, little is known of their nature. Of late, axion-like particles (ALPs) are emerging as one of the favoured candidate of dark matter. Because interaction of photons with ALPs induces birefringence amongst many other effects, propagation of linearly polarised electromagnetic signals through axion field imprint measurable signatures. In this seminar, I will discuss, from an observer’s perspective, some of the astrophysical probes that have been used recently to constrain the mass of ALPs and their coupling with photons. I will present a novel technique to probe ALP dark matter which we are currently developing – using spectro-polarimetric measurements at centimetre-wavelengths towards gravitationally lensed polarised quasars. This technique is then applied to a lensed system where we obtain stringent constraints on the ALPs in a lensing galaxy far far away!

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