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Searching for axion-like particles under strong gravitational lenses

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We establish strong gravitational lens systems as robust probes of axion-like particles (ALPs) – a candidate for dark matter. A tiny interaction of photons with ALPs induces birefringence. Multiple images of gravitationally lensed polarised objects allow differential birefringence measurement, alleviating systematics and astrophysical dependencies. We apply this novel method to the lens system CLASS B1152+199 and constrain ALP-photon coupling for ultra-light ALPs. We also discuss the forecast of future observations.

Presenter: URAKAWA, Yuko

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