

Seminar

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Bielefeld

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!

Tuesday, 19.11.2019, 14:15 Uhr

Place: D6-135

Seminar

Nan LI

Northeastern University, Shenyang, China

Black hole thermodynamics in the extended phase space

In this talk, we first review the so-called black hole thermodynamics in the "extended phase space", in which the cosmological constant is interpreted as a varying thermodynamic pressure, and the black hole mass is identified with its enthalpy rather than internal energy. Moreover, a thermodynamic volume can be introduced for a black hole space-time. In this framework, the equation of state of a black hole resembles that of the non-ideal fluid (e.g., the van der Waals equation), and a black hole can show abundant phase transition behaviors accordingly. Some applications, such as the Hawking-Page phase transition and the throttling process (Joule-Thomson effect), will be discussed in more detail.

Thursday, 05.12.2019, 14:15 Uhr

Place: D6-135