



Axion Searches with Laboratory-Based and Cosmic Light Sources.

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Webcast 16:00 h

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Axions and more generally axion-like particles (ALPs) are hypothetical pseudo Nambu Goldstone bosons which are predicted in numerous extensions of the standard model of particle physics. If sufficiently light, they are also particle candidates for dark matter. In the presence of electromagnetic fields, axions and ALPs could be detected through their oscillation into photons.

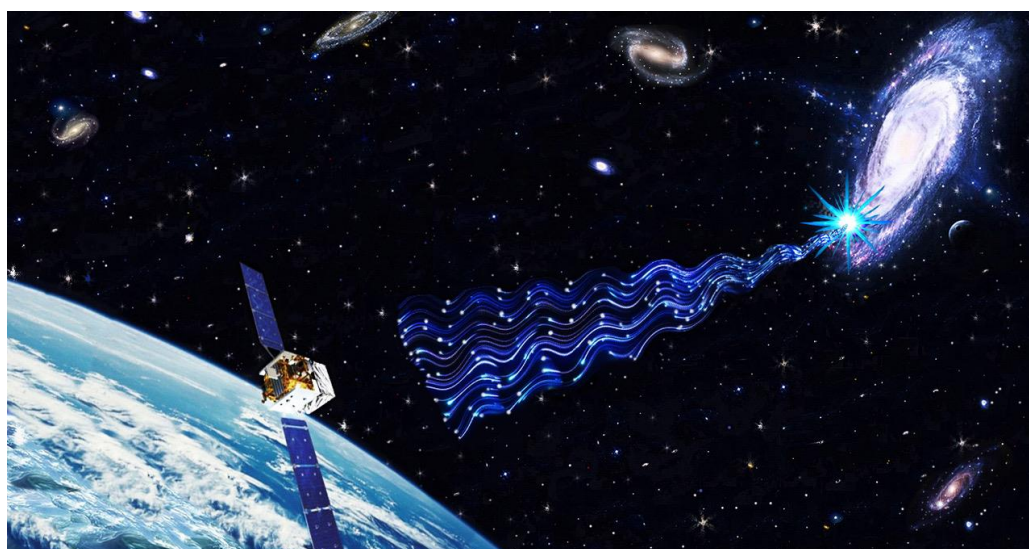
In this talk, I will lay out the planned research activities of the newly formed Axion Dark Matter Research Group at the University of Hamburg which is supported by an ERC starting grant. On the one hand, we will search for photon signals from regenerated axions and ALPs in the laboratory. In particular, we will contribute to the commissioning and data analysis of the transition-edge-sensor detector ALPS II, a light-shining-through-a-wall experiment realized at DESY. Additionally, we plan to contribute to the characterization of cryogenic detectors for the IAXO experiment. On the other hand, we will search for signatures of these particles in astrophysical observations at high-energy gamma-ray energies. For these searches, active galactic nuclei are especially promising observation targets, as they can be bright gamma-ray emitters and strong magnetic fields can be present along the line of sight. Another interesting target are core-collapse supernovae in which short bursts of ALPs could be produced at gamma-ray energies. I will discuss these observational signatures in light of planned or upcoming observatories.

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