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TALK: Nuclear Reactors as the Gateway to Potential Discoveries

Tuesday, July 16, 2024 9:00 AM (45 minutes)

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I will discuss a recently proposed novel experimental setup for axion-like particle (ALP) searches. Nuclear reactors produce a copious number of photons, a fraction of which could convert into ALPs via the Primakoff process in the reactor core. The generated flux of ALPs leaves the nuclear power plant, and its passage through a region with a strong magnetic field results in efficient conversion to photons, which can be detected. Such a magnetic field is the key component of axion haloscope experiments. I will discuss existing setups featuring an adjacent nuclear reactor and axion haloscope and I will demonstrate that the obtained sensitivity projections complement constraints from existing laboratory experiments, e.g., light-shining-through-walls.

Presenter: BRDAR, Vedran (Oklahoma State University)