

Progress on the ARIADNE axion experiment

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ARIADNE is a collaborative effort to search for the QCD axion using techniques based on nuclear magnetic resonance. In the experiment, axions or axion-like particles would mediate short-range spin-dependent interactions between a laser-polarized ^3He gas and a rotating (unpolarized) tungsten attractor, acting as a tiny, fictitious “magnetic field”. The experiment has the potential to probe deep within the theoretically interesting regime for the QCD axion in the mass range of 0.1-10 meV, while being independent of cosmological assumptions. The experiment relies on a stable rotary mechanism and superconducting magnetic shielding, required to screen the ^3He sample from ordinary magnetic noise. Progress on testing the stability of the rotary mechanism will be reported, and the design for the superconducting shielding in the experiment will be discussed.

Primary author: Prof. GERACI, Andrew (University of Nevada Reno)

Presenter: Prof. GERACI, Andrew (University of Nevada Reno)