

# Progress on the Axion Resonant InterAction Detection Experiment (ARIADNE) - REMOTE

*Thursday 11 August 2022 09:40 (20 minutes)*

The Axion Resonant InterAction Detection Experiment (ARIADNE) is a “fifth-force” experiment that can search for the QCD axion in the mass range of 10 micro-eV to 10 meV via its coupling to nucleons. In the setup, the QCD axion mediates a novel short-range spin-dependent interaction between an unpolarized tungsten source mass and laser-polarized  $^3\text{He}$  nuclei, that can be detected via nuclear magnetic resonance. By sourcing virtual axions locally, the approach is independent of cosmological assumptions, and unlike axion haloscopes, does not involve scanning over axion frequencies. The experiment requires a low-vibration non-magnetic liquid helium cryostat, superconducting shielding to limit ordinary magnetic noise, and a stable rotary system to modulate the axion-signal from the source mass. In this talk I will discuss the testing, characterization, and commissioning of several key components of the experimental apparatus and describe the next steps for bringing the experiment into its early data taking phase. When taken together with other existing and planned axion efforts, ARIADNE and other searches have the potential to discover the QCD axion over its entire allowed mass range.

**Primary authors:** GERACI, Andrew (Northwestern University); FOR THE ARIADNE COLLABORATION

**Presenter:** GERACI, Andrew (Northwestern University)

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