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The CASPEr nuclear magnetic resonance search for ultra-light axion-like dark matter

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The nature of dark matter is one of the most important open problems in modern physics. Axions and axion-like particles (ALPs) are strongly-motivated ultra-light dark matter candidates. Nuclear spins interacting with axion-like background dark matter experience a torque, oscillating at the axion Compton frequency. The Cosmic Axion Spin Precession Experiments (CASPEr) use precision magnetometry and nuclear magnetic resonance techniques to search for the effects of this interaction. I will describe how we use this approach to place new limits on interactions of axion-like dark matter in a broad mass range.

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