

Searching for Axions at Colliders

Axions are new particles linked to solutions to the strong CP problem of the Standard Model of Particle physics. Their existence is probed through a vast ongoing experimental programme sensitive to Axions and Axion-like particles (ALPs) with masses below the eV, all the way to LHC energies.

The student will first investigate the theoretical properties of Axions, and then develop new search strategies for heavy Axions at the LHC, taking advantage of the special properties of Axions and ALPs and their interactions with SM particles. Ultimately, the results from the research carried out in this Master Thesis Project would become an official search for new physics by the CMS experiment at CERN, performed with the full dataset (2015-2018) from the Run II of LHC.