

# Latest Updates on the International AXion Observatory (IAXO)

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“Axion helioscopes are searching for solar axions, which could be produced in the core of the Sun via Primakoff effect. Not only would these hypothetical particles solve the long-standing strong CP problem, but they are also one of the favored candidates for dark matter.

The International Axion Observatory (IAXO) is a next generation axion helioscope aiming at a sensitivity to the axion-photon coupling of a few  $10^{(-12)} \text{ GeV}^{(-1)}$ , i.e. 1 - 1.5 orders of magnitude beyond the one achieved by the currently most sensitive axion helioscope, the CERN Axion Solar Telescope (CAST).

Crucial factors in improving the sensitivity for IAXO are the increase of the magnetic field volume together with the extensive use of x-ray focusing optics and low background detectors, innovations already successfully tested at CAST.

In case of non-hadronic axion models, the Sun produces a larger flux as expected for hadronic models at the same value of the Peccei-Quinn scale, since here axions also couple directly to electrons. This allows for probing a broader range of models. IAXO will be the most sensitive axion search over a broad range of axion masses, reaching or surpassing the stringent bounds from SN1987A. The experiment will possibly be testing the axion interpretation of anomalous white-dwarf cooling for which an axion mass of a few meV is predicted. Beyond standard axions, this new experiment will be able to search for a large variety of axion-like particles (ALPs) and other novel excitations at the low-energy frontier of elementary particle physics in entirely unexplored ranges of parameters.”

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