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Solar Axion Searches with the International Axion Observatory (IAXO) and BabyIAXO

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The International Axion Observatory (IAXO) is a next-generation axion helioscope aiming at a sensitivity to the axion-photon coupling down to ~10^{-12} GeV^{-1}, ~1.5 orders of magnitude beyond current helioscopes. IAXO will probe QCD axions in the 1 meV~1 eV mass range, where they could constitute all or part of the dark matter in the Universe, as well as a large part of parameter space that includes ALP dark matter candidates and other novel excitations at the low-energy frontier of particle physics. As a preliminary step towards a full IAXO experiment, the collaboration is currently constructing BabyIAXO. BabyIAXO will not only serve as a testbed for prototype magnet, optic, and detector systems, but also probe four times lower in axion-photon coupling than the current leading helioscope limits. Both, IAXO and BabyIAXO rely on three major components: a powerful magnet, x-ray focusing optics and ultra-low background x-ray detector. In this contribution, we discuss the status of BabyIAXO and IAXO, as well as the anticipated science impact of each.

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