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The Imaging X-Ray Polarimetry Explorer

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Almost half a century will have passed since the first satellite experiment to attempt to measure the polarization of non-solar X-ray sources, the Bragg crystal polarimeter aboard the Orbiting Solar Observatory number 8, was performed. NASA's Small Explorer Mission, the Imaging X-ray Polarimetry Explorer (IXPE), which I have the privilege to be the Principal Investigator of, is scheduled for launch in early 2021. IXPE will be much more powerful than the instrument aboard OSO-8 and is based on a very different technology. Using revolutionary and advanced technology developed in Italy, the IXPE detector's exploit the capability to track the photoelectron produced in the initial interaction of the incident X-ray with the gas in an imaging proportional counter. Coupling the detectors with X-ray optics to render the background essentially negligible results in a polarimeter that can produce time and/or energy resolved images of the brighter and most interesting X-rays sources, namely neutron stars and black holes. We present an overview of the design of IXPE and its capabilities including highlights of several astrophysically important and unique experiments that will be performed.

Topic

Future missions

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