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IXPE observations of supernova remnants

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Supernova remnants (SNRs) are among the most important sources of non-thermal X-rays in the sky and likely contributors to Galactic cosmic rays and represent ideal targets to showcase the capabilities of the Imaging X-ray Polarimetry Explorer (IXPE) in performing spatially-resolved X-ray polarimetry.

For the first time, we can determine the turbulence level (through the measurement of polarization degree) and the orientation (through polarization direction) of the magnetic field near the shocks, where particle acceleration occurs.

IXPE reported so far the results of the observations of four SNRs: Cas A, Tycho, SN 1006 and RX J1713.7-3946. These objects exhibit a wide range of characteristics, including dynamical age, spectral composition of emission, and progenitor type.

Aptly, they revealed significantly different results among them in terms of magnetic field properties and morphology, providing unexpected insights and shedding light on the particle acceleration mechanisms in astrophysical shocks.

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Session Classification: IXPE observations and multiwavelength opportunities

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