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Implications of IXPE's Polarization Results of BH X-Ray Binaries

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X-ray polarimetry offers a unique insight into black hole X-ray binary systems that are found predominantly in the high soft (HSS) and low hard (LHS) states. The Imaging X-ray Polarimetry Explorer (IXPE) recently observed Cygnus X-1 and Cygnus X-3 in the LHS where black hole coronal emission tends to dominate. The polarization signature of this coronal Comptonized emission can be used to constrain the geometry of the corona, its viewing angle, and the origin of soft X-ray seed photons. IXPE also observed 4U1630-47 and LMC X-1 in the HSS where the polarization of thermal emission from the optically thick accretion disk can be used to rectify the degeneracies between black hole mass, spin, and inclination. We report on the physical consequences of these first IXPE observations and the science driven by this new chapter in X-ray polarimetry.