Stellar X-ray Polarimetry

Most of the stellar end-state black holes, pulsars, and white dwarfs that are X-ray sources should have polarized X-ray fluxes. The degree will depend on the relative contributions of the unresolved structures. Fluxes from accretion disks and accretion disk corona may be polarized by scattering. Beams and jets may have contributions of polarized emission in strong magnetic fields. The Gravity and Extreme Magnetism Small Explorer (GEMS) will study the effects on polarization of strong gravity of black holes and strong magnetism of neutron stars. Some part of the flux from compact stars accreting from companion stars has been reflected from the companion, its wind, or accretion streams. Polarization of this component is a potential tool for studying the structure of the gas in these binary systems. Polarization due to scattering can also be present in X-ray emission from white dwarf binaries and binary normal stars such as RS CVn stars and colliding wind sources like Eta Car. Normal late type stars may have polarized flux from coronal flares. But X-ray polarization sensitivity is not at the level needed for single early type stars.