



Credit: NASA/GSFC/Dana Berry

# A broad-band X-ray view of accretion disks around neutron stars

MCKINLEY BRUMBACK | *CALTECH*

Gas falling onto highly magnetized neutron stars can form complex structures known as accretion streams when ionized gas interacts with the neutron star's strong gravitational and magnetic fields. While theoretical models can predict accretion stream structure, observations are needed to constrain these models and investigate the behavior of matter in extreme environments. In this talk, I will discuss the geometry and kinematics of gas within the magnetosphere of three pulsars thought to contain warped inner accretion disks: LMC X-4, SMC X-1, and Her X-1. The geometry of these warped disk systems is such that hard pulses, directly from the pulsar beam, and soft pulses, reprocessed by the accretion disk, can be disentangled with broad-band X-ray coverage. I will describe the X-ray reverberation mapping technique used to prove the presence of a rotating inner disk and model its geometry. I will also discuss ongoing follow-up of these systems using the NICER X-ray telescope to examine how pulse profiles change on short time scales and what these changes imply about the geometry of the system.

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