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Accretion in Ultracompact X-ray Binaries: A Unified Picture of 4U 1626-67

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Ultracompact X-ray binaries (UCXBs) are binaries with a neutron star accretor and an orbital period less than 80 minutes. Here, I focus on our comprehensive review of *Chandra* observations of the unique UCXB 4U 1626-67, the only known UCXB to host a strongly-magnetized accreting pulsar. Our sophisticated modeling of the X-ray gratings spectra finds intriguing results: we observe strong, double-peaked emission lines of neon and oxygen, consistent with an accretion disk made up of a collisionally-ionized, two-temperature, pure Ne/O plasma. This is an unexpected result in several respects: the X-ray pulsar was expected to produce a photoionized plasma, not collisional; the two-temperature structure is difficult to reconcile with the measured distance scales of the accretion disk; and the composition of the donor is out of line with any standard white dwarf model. However, we believe we have come up with a coherent picture of this source that reconciles most of these conflicts, which I will present.

Topic

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