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Accreting white dwarfs in the era of all-sky surveys

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Abstract

Accreting white dwarfs (AWDs) are compact binary systems in which a white dwarf accretes matter from a Roche-lobe-filling companion star. I present recent results from searches for AWDs across different X-ray and optical catalogs. I review a multiwavelength approach to classifying new AWDs among stellar objects based on an "X-ray Main Sequence," a phase space defined by the X-ray-to-optical flux ratio, and Gaia optical BP-RP color. Using this method, we identified a dozen new AWD candidates through cross-matching various X-ray catalogs, Gaia proper motion data, and optical photometric data. To confirm the nature of these objects, we conducted optical spectroscopic follow-up observations with the Keck, Hale, and BTA-6 telescopes. We have discovered a dozen new magnetic and non-magnetic AWDs, including an eclipsing AM CVn system, a period-bouncer, polars, and intermediate polars. These results demonstrate that a combined X-ray and optical analysis, along with spectroscopic follow-up, can be a powerful tool for identifying AWDs in large X-ray and optical catalogs.