The Beginnings and Ends of Double White Dwarfs

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The evolutionary history of AM CVn binaries

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AM CVn stars are ultracompact, accreting binaries in which both stars are either degenerate or semi-degenerate. Several formation channels have been suggested for AM CVn binaries, including a favoured model in which they descend directly from double white dwarf binaries. The double white dwarf channel has uncertainties around the fraction of double degenerate binaries which will reach a state of stable accretion versus those that will merge. Historic observations of the composition of the accreted material have favoured the double white dwarf channel as a prominent source of AM CVn binaries. On the other hand, recent observations seem to challenge current models of the double white dwarf channel. These observations include donor mass measurements (especially from eclipsing systems) and absolute magnitude measurements from Gaia. Both sets of observations suggest that the donors in AM CVn binaries are more inflated than is predicted by current models of the double degenerate channel. I will present an overview of these results and discuss future work that might help to unveil these mysteries.

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