Cosmochemical-style insights for exoplanetary systems

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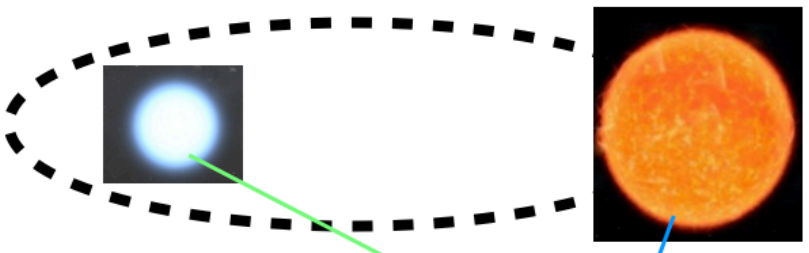
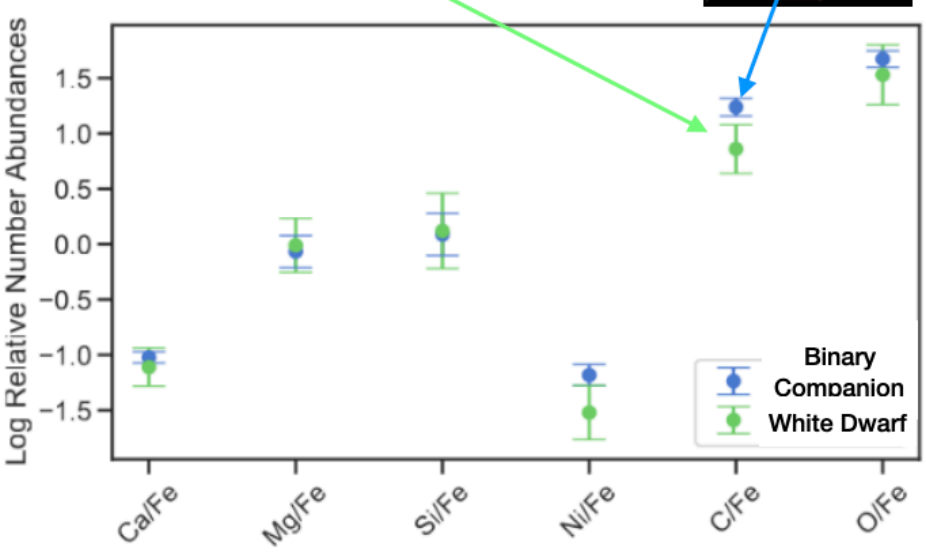
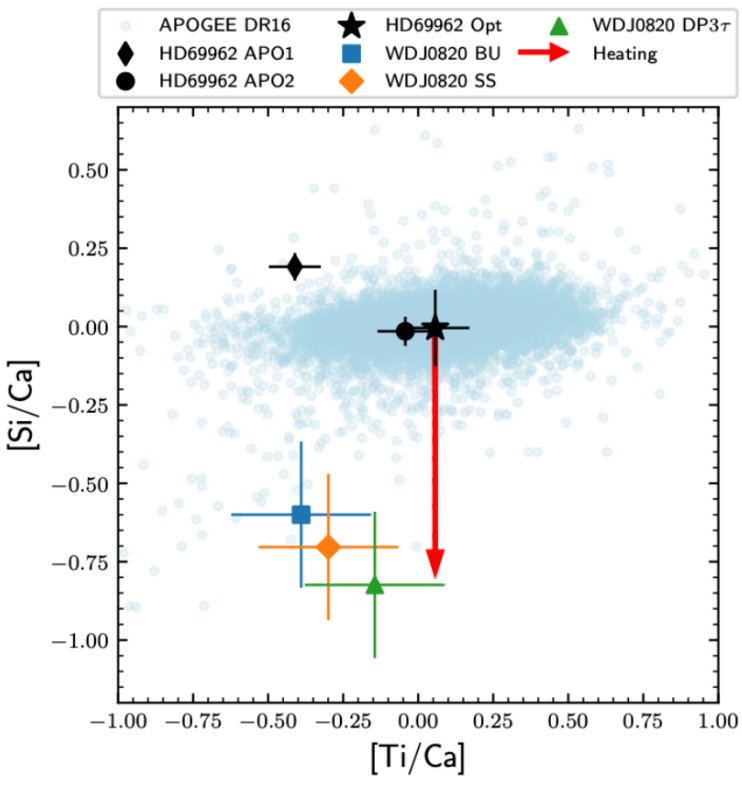
We live in an epoch of rocky exoplanet discovery. Yet characterising the interior of these planets remains hard. If we are to truly know what it is like on the surface of these planets or understand their habitability, we need to know what they are made from. The composition of host-stars provides crucial insights - but how does planet formation alter the compositions of exoplanets? By characterising the abundances of planetary material in the atmosphere of a white dwarf with a main-sequence companion, this work provides observations of both planet and host-star compositions. Cosmochemical-style insights are possible for exoplanetary systems. These observations tell us how planet formation altered planetary abundances, in particular quantifying the loss of volatiles. Insights from white dwarf - main-sequence wide binary systems will aid future characterisation of rocky planet interiors based on host-star compositions.



There is a match in the refractory composition of WD 1425 accreted a Kuiper-belt like object and its K-dwarf companion Bonsor, A, Jofré, P, Shorttle, O., Rogers, L. K., Xu, S., Melis, C., 2021, MNRAS, 503,187

Aguilera-Gomez et al, 2024, A&A, submitted





Evidence that the planetary material accreted by the white dwarf WD J0820 is depleted in Ca, Ti relative to Mg,, but the abundances are otherwise consistent with those of its main-sequence companion in the scenario portrayed in the cartoon. Aguilera-Gomez et al, 2024, A&A, submitted