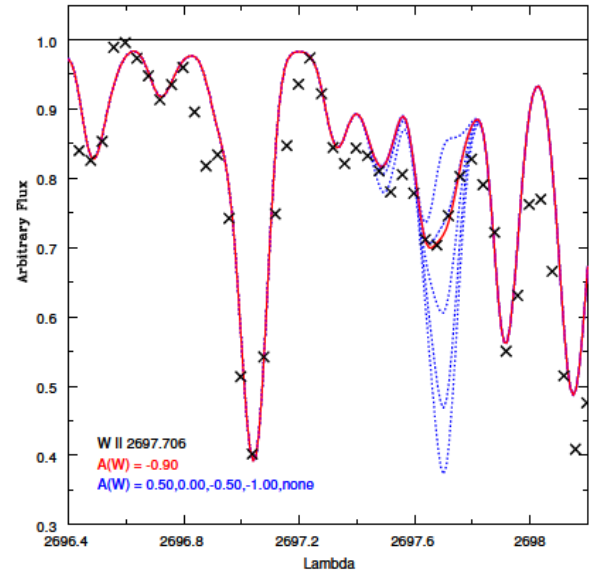


HST Abundances of Heavy Elements in the U-rich EMP Star CS 31082-001

The origin and site(s) of the r-process nucleosynthesis is(are) still not known with certainty, but complete, detailed r-element abundances offer our best clues. The few extremely metal-poor (EMP) stars with large r-element excesses allow us to study the r-process signatures in great detail, with minimal interference from later stages of Galactic evolution. CS 31082-001 is an outstanding example of the information that can be gathered from these exceptional stars.

JINA researchers have recently carried out new and improved analyses for elements of the first and second r-process peaks from near-UV HST/STIS and optical UVES spectra. New abundances for 23 neutron-capture elements have been measured, 6 of which – Ge, Mo, Lu, Ta, W, and Re – have not been reported previously for this star. **This makes CS 31082-001 the most completely studied r-II star, with abundances for a total of 37 neutron-capture elements.** This work also presents the first NLTE+3D abundance of lead in this star, further constraining the nature of the r-process.

Predicted abundance patterns for a theoretical model of the r-process by Wanajo (2007), compared with the newly observed abundances in CS 31082-001.



Fit of the W II 2697.706 Å line in CS 31082-001

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