Hubble Space Telescope

Cycle 15 AR Proposal

Germanium Abundances for Stars with Near-Solar Metallicities

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Abstract

Which nucleosynthesis process or processes produce the element germanium remains obscure. The element falls in the periodic table just beyond the iron peak, where several production mechanisms are possible that vary in timescale. We propose to determine the abundance of germanium and related elements in stars of near-solar metallicity, to constrain the mechanism and perhaps the timescale of Ge formation at these metallicities. We will use our updated line list to synthesize line blends, yielding abundances for two dozen dwarfs and subgiants of metallicities ranging from 1/200 solar to greater-than-solar that have high-quality archival STIS echelle spectra. This will clarify the synthesis of germanium and its relationship to other elements; show if the germanium abundance ratio tracks parameters such as stellar age, and assist the interpretation of the abundance patterns of high-redshift damped Lyman alpha absorption-line systems and planetary nebulae.

Investigators:

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