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Galactic Archaeology with Globular Clusters - Europium is a Chemical Tag Between Globular and their Hosts Across All Metallicities

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Globular clusters (GCs) are among the most ancient objects in the local Universe, acting as tracers of galaxy formation across both space and time. With the recent JWST discovery of nitrogen-rich star formation in a redshift 11 galaxy, and the discovery that over 50% of the in-situ stars in the Milky Way (MW) likely formed in clusters, understanding the role of GCs in the context of galaxy evolution is becoming ever more important. The MW hosts a large (~150) and diverse population of GCs. Among these clusters, a fraction are thought to have formed in-situ, alongside the MW, while others were likely accreted alongside disrupted dwarf galaxies. Finding a chemical tag linking accreted GCs to their host galaxies is key to further unscrambling the MW halo. I will present results showing that the ratio of [Eu/Si] separates dwarf galaxy and MW stars at the same metallicities and that this difference extends to the populations of accreted and in-situ GCs. While this difference has been seen before at high-metallicities, I will show that it extends to metallicities of [Fe/H] < -2 and that the difference cannot be explained by star formation efficiency alone. I will also show that this unique signature not only extends to Local Group dwarf galaxies and their globular clusters, but also to the halo of M31 - offering the opportunity to do Galactic Archaeology in an external galaxy.

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