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# Chemical characterization of the Tucana II, Tucana III, and Sagittarius II dwarf galaxies using SkyMapper photometry

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Ultra-faint dwarf galaxies are some of the oldest systems ($\sim$13Gyr) in the Milky Way halo. Studying the metallicities of their stars can place strong constraints on models of early chemical enrichment. Spectroscopy only permits the detailed chemical characterization of a handful of stars per system. This under-sampling has led to open questions such as whether the most metal-poor stars ($[\text{Fe/H}] < -4.0$) also exist in these systems.

I will present the first metallicity analysis of the Tucana II, Sagittarius II, and Tucana III ultra-faint dwarf galaxies based on deep narrow-band SkyMapper photometry. This new technique uses a narrow 'v' imaging filter that can yield simultaneous metallicity measurements down to g~22, sampling the full red giant branch of these systems. We have found new members in all three systems and evidence of tidal features in one system. We further obtained high-resolution spectra for two newly identified members of Tucana II, confirming it to be another typical ancient dwarf galaxy.

Implications are that we can produce spatially complete, magnitude-limited metallicity distributions of the most metal-poor members ($[\text{Fe/H}] < -2.0$) of these systems. A complete sampling of their most metal-poor stars is crucial for modeling element formation, metal mixing, and improving our understanding of the building blocks of Milky Way-sized galaxies.

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## Talk/Poster

Talk

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