

ANALYTICAL SEMINAR

Diving Into Darkness: Unveiling Deep-Sea Chemistry Through Underwater Mass Spectrometry

Samantha Schmidt

Graduate Student
Purdue University



As global climate change becomes more of a concern, and studying the origin of life occupies many researcher's minds, volatile organic compounds (VOCs) are of increasing importance. While atmospheric research of VOCs has taken off, investigating both natural and anthropogenic VOCs in the deep ocean has proven much more difficult. With recent advances in underwater mass spectrometry, scientists can now study VOCs as deep as 6000 meters below sea level, allowing for VOC depth profiles extending beyond all previous records. Underwater mass spectrometry coupled with gas chromatography can aid in piercing through the volatile compounds that dwell within our ocean, and maybe, just maybe, help determine the origins of life on Earth.



Tuesday, September 23, 2025



3:30 pm



WTHR 172



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James Tarpo Jr. and Margaret Tarpo
Department of Chemistry

ANALYTICAL SEMINAR

Exploring the Universe with Integral Field Spectrographs: From Planetary Atmospheres to Distant Galaxies

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Integral field spectrographs (IFS), or integral field units (IFUs), have revolutionized astronomy by combining imaging and spectroscopy to produce three-dimensional maps of the universe. By capturing spatially resolved spectra, IFS allows astronomers to trace the chemical composition and physical conditions of objects ranging from planetary atmospheres to distant galaxies. In this presentation, I will introduce the principles and instrumentation of IFS, and present science cases from JWST and MUSE that reveal ionospheric chemistry in Jupiter and elemental fingerprints in Type Ia supernovae. These examples show how IFS opens a powerful new window on the chemistry and evolution of the cosmos.



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