

From Interstellar Ices to Polycyclic Aromatic Hydrocarbons

A symposium to honor Lou Allamandola's Contributions to the Molecular Universe

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Probing the Composition of Primitive Solar System Materials with a Compact Laser Mass Spectrometer

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To contribute to and complement our understanding of the processes governing the formation, distribution, and evolution of primitive materials throughout the solar system, it will be critical to form connections between broad remote sensing spectroscopic surveys, laboratory measurements of analogs and samples delivered to Earth, and in situ measurements of the surface composition on future primitive body missions. Recently, a laboratory prototype employing resonance two-step laser mass spectrometry [Getty et al., 2012] has been coupled to a cryogenic sample stage [Grubisic et al. in prep.] to enable measurements of analog samples that are relevant to these fundamental questions. Analyses of mineral-aromatic mixtures, organically doped water ices, and meteorite powders will be presented. Our goals are twofold: (1) to conduct laboratory studies on solar system analog, meteoritic, and potentially returned samples to elucidate composition, and (2) to provide a compact but capable analytical instrument for discovery-driven in situ interrogation of surface chemistry on a future mission, such as to a Trojan asteroid, comet, or icy moon.

REFERENCES

Getty, S. A., Brinckerhoff, W. B., Cornish, T., Ecelberger, S., and Floyd, M. 2012. Rapid Communications in Mass Spectrometry 26, 1

Grubisic, A., Uckert, K., Getty, S. et al., in preparation.