

# From Interstellar Ices to PAHs

A symposium to honor Lou Allamandola's Contributions to the Molecular Universe  
Annapolis, MD, USA - September 13<sup>th</sup> to September 17<sup>th</sup>, 2015

## INVITED TALK

### Laboratory Studies of Astronomical Ices at the NASA Goddard Space Flight Center: Past Successes, Present Efforts, and Future Perspectives

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NASA has supported an active laboratory research program to study the chemistry and spectroscopy of astronomical ices for over 30 years at the Goddard Space Flight Center. Our group's earliest work, and that in the recent past, helped to establish chemical and physical phenomena in ices that are still being studied and led to predictions later verified by astronomical observers and expanded upon by others. More specifically, radiation-chemical and spectroscopic methods have been used to provide insight into the expected evolution of icy materials within and beyond the Solar System, motivated by potential applications to NASA-related, and NASA-funded, projects.

This presentation will begin with a brief review of our research group's original purpose and goals, followed by several examples of current research into low-temperature irradiated ices. Both published and unpublished results will be presented. In the final part of the presentation the speaker will offer a few brief perspectives and predictions for the near future of the field.

Of particular relevance to this meeting, the speaker also will comment on a few ways in which Lou Allamandola and co-workers have influenced the Goddard group's work in a friendly rivalry extending over three decades.

#### REFERENCES

- Hudson, R. L., Gerakines, P. A., and Loeffler, M., Activation of Weak IR Fundamentals of Two Species of Astrochemical Interest in the Td Point Group - The Importance of Amorphous Ices. *Physical Chemistry Chemical Physics*, 2015
- Gerakines, P. A. and Hudson, R. L., The Infrared Spectra and Optical Constants of Elusive Amorphous Methane. *The Astrophysical Journal Letters*, 2015
- Loeffler, M. and Hudson, R. L., Descent without Modification? The Thermal Chemistry of H<sub>2</sub>O<sub>2</sub> on Europa and Other Icy Worlds. *Astrobiology*, 2015

Gerakines, P. A. and Hudson, R. L., The Radiation Stability of Glycine in Solid CO<sub>2</sub> - In situ Laboratory Measurements with Applications to Mars. *Icarus*, 2015