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CSO SPECIAL SCIENCE SEMINAR

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TIME: 11:00AM, Friday 12th October 2007

PLACE: CSO Conference Room

TITLE: Hydrogenated/Deuterated Species; Observations and Models

SPEAKER: Dr. Evelyne Roueff
Observatoire de Paris

ABSTRACT:

Thirty interstellar and circumstellar molecules containing deuterium have been detected to date, with several doubly- and triply-deuterated isotopologues. The fractionation ratio, defined as the ratio of the column density of a deuterated molecule to its hydrogen counterpart, is often found to be orders of magnitude higher than the elemental abundance ratio, which is typically from 1.5×10^{-5} to 2.3×10^{-5} . This deuterium enhancement results from chemical processes, which may involve both gas-phase [1,2] and surface reactions [3]. Observational data and detailed gas-phase models will be reviewed. Particular emphasis will be put on ortho/ para chemistry and on the role of deuterated hydrocarbons as vectors for deuteration. We also discuss the consequences of local elemental deuterium enhancements on molecular fractionation ratios [4].

[1] Roberts, H., Herbst, E., Millar, T.J., 2003, ApJ 591, L41,

Roberts, H., Herbst, E., Millar, T.J., 2004, A&A 424, 905

[2] Roueff, E. Lis, D., van der Tak, F.F.S., Gerin, M., Goldsmith, P., 2005, A&A 438, 585

[3] Lishat, A., Biham, O., Herbst, E., 2004, MNRAS 348, 1055

[4] Roueff, E., Herbst, E., Lis, D., Phillips, T., 2007, ApJL in press.

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