

## Detection of $D_2H^+$ in the Dense Interstellar Medium

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The 692 GHz para ground-state line of  $D_2H^+$  has been detected at the Caltech Submillimeter Observatory towards the pre-stellar core 16293E. The derived  $D_2H^+$  abundance is comparable to that of  $H_2D^+$ , as determined by observations of the 372 GHz line of ortho- $H_2D^+$ . This is an observational verification of recent theoretical predictions (*Roberts, Herbst & Millar, 2003*), developed to explain the large deuteration ratios observed in cold, high-density regions of the interstellar medium associated with low mass pre-stellar cores and protostars. This detection confirms expectations that the multiply deuterated forms of  $H_3^+$  were missing factors of earlier models. The inclusion of  $D_2H^+$  and  $D_3^+$  in the models leads to predictions of higher values of the D/H ratio in the gas phase.

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- [a] Roberts, Helen, Herbst, Eric, and Millar, T.J., Enhanced Deuterium Fractionation in Dense Interstellar Cores Resulting from Multiply Deuterated  $H_3^+$ , *ApJ Lett.*, **591**, L41–L44, 2003.