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Merged-Beams studies for Astrophysics and Astrobiology

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Using merged beams techniques we have developed experimental apparatuses to study neutral-ion chemical reactions. Such reactions are important for large structure formation in the early universe as well as developing the molecules necessary for life. One apparatus has been used to measure the associative detachment reaction of hydrogen which aids the formation of early stars. A separate apparatus has been used to study neutral carbon reactions with H_3^+ which are believed to be key gas-phase pathways to initiating organic chemistry in molecular clouds.

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