

UNLOCKING THE POTENTIAL OF THE MOST DEFINITIVE MOLECULAR TRACER OF UV-ENHANCEMENT:
1-C₃H⁺

ANDY LIPNICKY, North American ALMA Science Center, National Radio Astronomy Observatory, Charlottesville, VA, USA; RYAN A LOOMIS, CRYSTAL L. BROGAN, NAASC, National Radio Astronomy Observatory, Charlottesville, VA, USA; BRETT A. McGUIRE, Department of Chemistry, Massachusetts Institute of Technology, Cambridge, MA, USA.

The interstellar molecule 1-C₃H⁺ appears to be the most sensitive and definitive molecular tracer of enhanced UV-flux ever observed in the ISM. Extensive, deep searches for this species in dozens of sources show its presence nearly exclusively in UV-enhanced regions. Yet, our understanding of the spatial distribution of the molecule within these sources, and the excitation conditions (and abundances) in previously-observed regions, is sorely lacking. I will discuss recent ALMA observations of 1-C₃H⁺ in the Horsehead PDR region that have revealed an unexpected large-scale distribution of 1-C₃H⁺. With these data we wish to better understand the spatial distribution, abundance, and excitation of this potentially transformational molecule in our ability to probe the extent of UV-enhanced flux in these and other key regions. The results will be used to refine state-of-the-art PDR chemical modeling codes.