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Observations of Interstellar Pickup Ions and their Suprathermal Tails in Interplanetary Space and in the Heliosheath GEORGE GLOECKLER, LEN FISK, University of Michigan — Since the invention of space-borne time-of-flight mass spectrometers in the late 1990s, distribution functions of singly charged interstellar pickup ions, produced primarily by charge exchange with the solar wind and by photoionization of the interstellar neutral gas, have been observed from 1 to $\sim$ 5 AU in interplanetary space. Here we summarize observed characteristics of pickup ion spectra (primarily of H^+ and He^+) as well as of the pickup ion tails that are readily produced in Local Acceleration Regions in space, both at 1 AU and in the heliosheath, and briefly discuss the most likely mechanisms for producing interstellar pickup ions as well as their tails that in the heliosheath extend to high ($\sim$ 10 MeV/nuc) energies.

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