

Local Interstellar Environment: open questions

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Abstract

Studies of the Galactic interstellar medium by means of its multi-wavelength emission, or its imprinted absorption in spectra of background objects, has made it possible to build sophisticated models of its composition and cyclic evolution, from star formation to dispersion of stellar ejecta in 3D space. In-situ measurements of interstellar gas and dust directly surrounding the Sun have provided important information, but have been limited to a few species that have survived filtration by the heliosphere or to their derivatives. A major step forward has been made recently during the successive crossings of the heliopause of Voyager 1 and 2. Nevertheless, questions remain unanswered about the impact of the boundary between the solar wind and the interstellar medium on the pristine circumsolar interstellar medium and many aspects of its unaltered composition and physical state have not yet been covered. I will address some of these aspects, focusing on issues concerning the interstellar medium that have not been resolved by remote astronomical observation programs and would benefit from an Interstellar Probe.