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Review of the Local ISM

The local interstellar medium (LISM), consisting of neutral and ionized gas, dust, and magnetic fields, is the environment for the heliosphere and stellar astrospheres. LISM gas and magnetic fields penetrate deeply into these environments. The LISM consists of the partially ionized gas clouds extending to about 10 pc from the Sun, the surrounding Local Bubble with its fully ionized hydrogen gas extending to several hundred parsecs from the Sun, and interactions with the external Galaxy. Absorption in resonance lines, primarily in the ultraviolet, observed by the Hubble Space Telescope and in situ measurements by the Voyager, New Horizons, Ulysses, and IBEX spacecraft are providing important data concerning the composition and properties of the LISM. This talk will review what we have been learning about the LISM - its structures, thermal and non-thermal properties, turbulence, ionization, inhomogeneity, and pressure balance among its components. As the Sun speeds through the LISM at 25 km/s, large changes in the size and properties of the heliosphere occur when it passes through cold dense clouds, partially ionized gas, or fully ionized gas. Cosmic rays traverse the different structures in the LISM and are modified by these environments.

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