

# Properties of the Interstellar Medium Surrounding the Sun and Nearby Stars

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The Sun and nearby stars are surrounded by warm, partially ionized gas called the local interstellar medium. This material dictates the structure of the heliosphere and astrospheres. Many, perhaps all, nearby stars have exoplanets. The unique properties of a star's electromagnetic radiation, particle wind, and the size of the astrosphere can all influence a planet's thermal and chemical atmospheric structure. As our capability to discover and characterize exoplanets and their atmospheres continues to improve, the habitability of these planets will become a central and potentially radical scientific research question. At the heart of this question will be the relationship of the planet with its host star within its astrosphere, as well as an understanding of the relationship between our own solar system planets and the Sun within our heliosphere. Therefore, a thorough understanding of the physical properties of the surrounding interstellar medium (ISM) is critical. We see dramatic variations in properties (e.g., density, relative velocity, turbulence, temperature, ionization) through the ISM which argue for comparably dramatic variations in the heliosphere and astrospheres. I will review the attributes of the local ISM, present new observations that search for astrospheres around nearby stars with known exoplanetary systems, and explore the connections between the ISM and planets.