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The Voyager Journey to Interstellar Space: Overview and Update

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After a thirty-five year journey, Voyager 1 began observing the properties on the very local interstellar medium on August 25, 2012, at a radial distance of 121.6 AU. Now at 132 AU, Voyager 1 has been exploring the region where the interstellar wind and magnetic field are perturbed by the flow of interstellar ions around the heliosphere and the formation of a wall of H atoms. The plasma density is ~100 times that observed in the outer heliosphere, and the intensity of galactic cosmic rays is at the highest level observed, with transient variations caused by the arrival of Merged Interaction Regions originating at the sun. Although the interstellar magnetic field is distorted as it wraps around the heliosphere, the turbulence in the field is <1% of the average field. This very weak turbulence leads to extremely low cosmic ray scattering rates and pitch angle anisotropies that persist for months.

Now at 108 AU, Voyager 2 continues to explore the outer regions of the heliosheath where the solar wind flow has turned 75 degrees from radial as it flows toward the heliotail. Even though solar maximum conditions persist, the galactic cosmic ray intensity at Voyager 2 has been increasing and is now ~80% of that observed by Voyager 1, suggesting Voyager 2 may reach interstellar space in several years.

Collaboration

– not specified –

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