NASA Heliophysics System Observatory (HSO)

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The goal of NASA's Heliophysics Division is to develop an understanding of the Sun and its interactions with the Earth and the solar system, including space weather. Heliophysics encompasses science that improves our understanding of fundamental physical processes throughout the solar system, and enables us to understand how the

Sun, as the major driver of the energy throughout the solar system, impacts our technological society. Heliophysics incorporates studies of the interconnected elements in a single system that produces dynamic space weather and that evolves in response to solar, planetary, and interstellar conditions. The recent launches of Van Allen Probes and the Small Explorer, IRIS, along with the and upcoming launch of the major strategic mission–MMS – and the distributed systems observatory they create in combination, are significant assets allowing our scientific community to achieve major advances in understanding and predicting the space environment.

The heliophysics NRC decadal survey, Solar and Space Physics: A Science for a Technological Society (NRC, 2013), articulates the scientific challenges for this field of study and recommends advances culminating in the achievement of a predictive capability to aid human endeavors on Earth and in space.

The programs, initiatives, and investments in the field outlined in the Survey and codified in the Heliophysics community roadmap are designed to make fundamental advances in current scientific knowledge of the governing processes of the space environment—from the interior of the Sun, to the atmosphere of Earth, to the local interstellar medium. To meet national and societal space weather needs, NASA coordinates its space weather activities with several interagency and international partners.