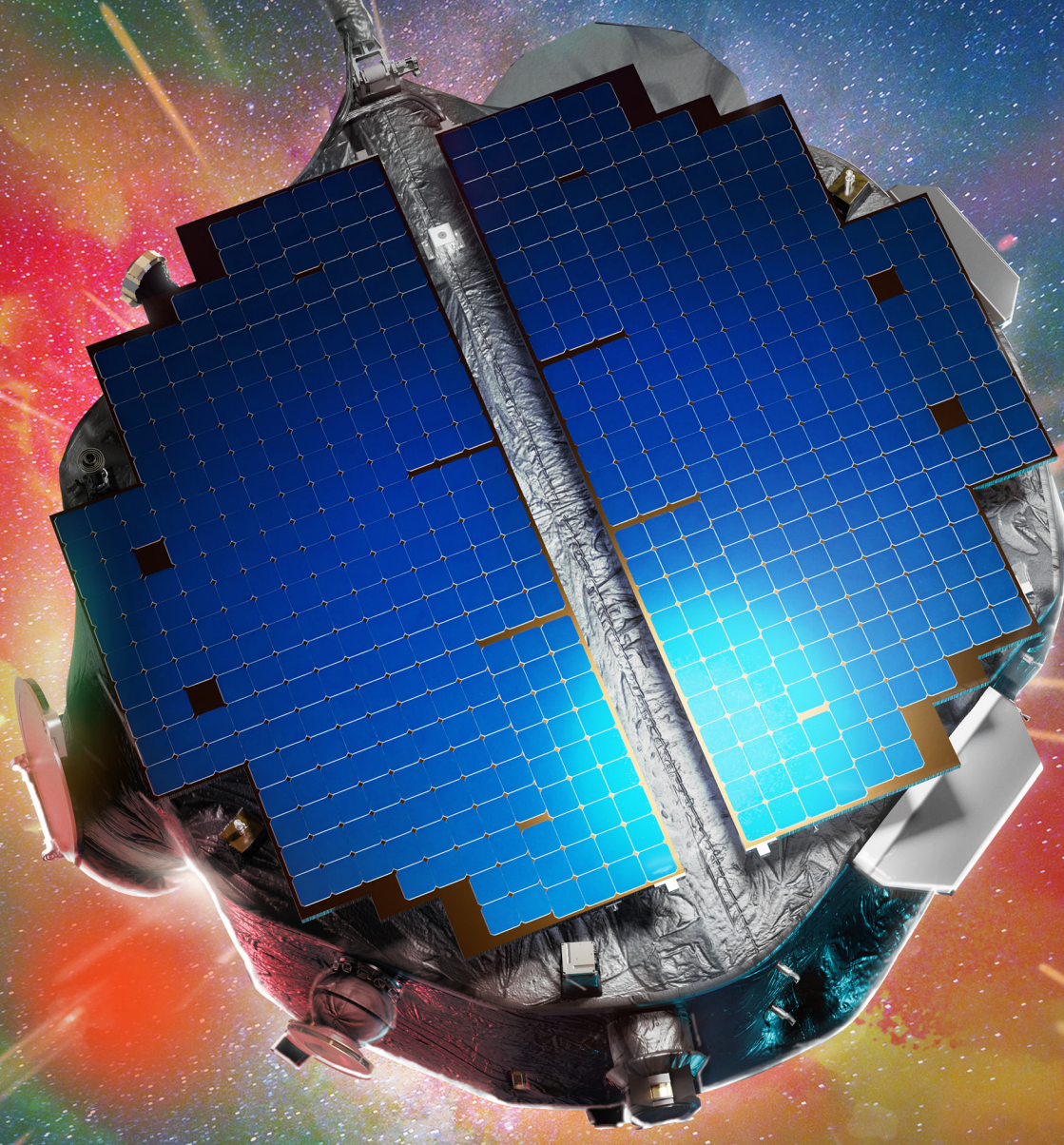
National Aeronautics and Space Administration

Exploring Our Solar Neighborhood and Its Space Weather



IMAP

INTERSTELLAR MAPPING AND ACCELERATION PROBE

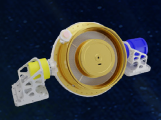
Learn more at nasa.gov/imap and imap.princeton.edu/

How IMAP Decodes the Messages in Particles

FROM THE SUN AND BEYOND OUR COSMIC SHIELD

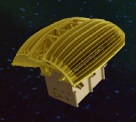
INSTRUMENTS

IMAP's ten instruments work together in teams to measure and map different components of the inner and outer heliosphere.



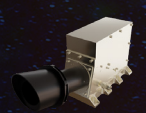
IMAP-Lo: Imager measuring and mapping low-energy energetic neutral atoms (ENAs), particles created where the solar wind and interstellar medium meet, as well as interstellar neutral particles from beyond the solar system

IMAP-Hi: Imager measuring and mapping medium-range ENAs from the edge of the heliosphere

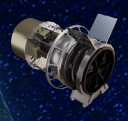


IMAP-Ultra: Imager measuring and mapping ENAs at their highest range from the edge of the heliosphere

IDEX: Instrument measuring the composition of interstellar and interplanetary dust particles

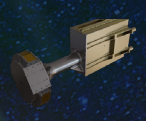


GLOWS: Photometer investigating the ultraviolet glow created by the solar wind to understand how it evolves over time

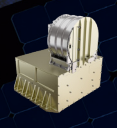


SWAPI: Instrument designed to measure ions from the solar wind and particles from beyond the solar system

CoDICE: Instrument designed to measure the mass and electric charge of ions originating from both interstellar space and the solar wind



HIT: Particle telescope studying high-energy ions that come from the solar wind and deep space



SWE: Instrument used to measure electrons found in the solar wind

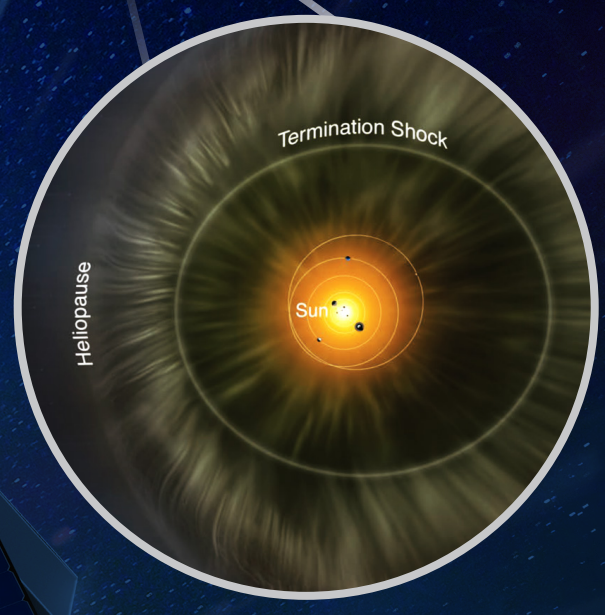
MAG: Magnetometer that will measure the interplanetary magnetic field that originates from the Sun

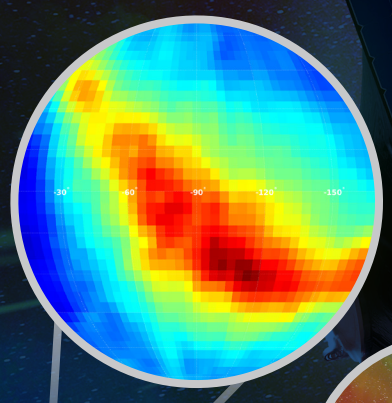
Space Weather IMAP Active Link for Real Time (I-ALiRT)

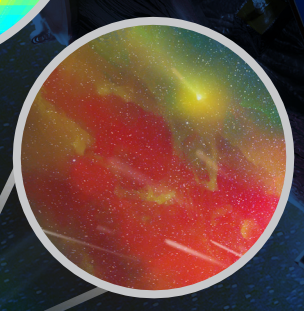
HELIOSPHERE

The Sun releases streams of charged particles that blow a magnetic bubble around our solar system. This bubble, called the heliosphere, dramatically reduces the amount of dangerous radiation able to enter our solar system—radiation that can endanger both astronauts and important infrastructure in space. **IMAP maps the heliosphere's boundary by collecting solar particles that have traveled from the Sun out to the heliosphere's edge, where they become neutral, allowing them to travel back in toward IMAP.**

Image of the heliosphere with termination shock, heliopause, Sun, and planet orbits





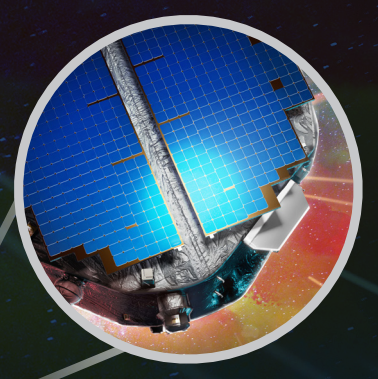


RIBBON MAP AND ENAS

IMAP collects energetic neutral atoms (ENAs) that come from the boundary regions of our heliosphere. An earlier NASA mission, the Interstellar Boundary Explorer (IBEX), found a high concentration of these ENAs coming from a "ribbon" shaped region at the heliosphere's edge. IMAP's instruments will collect ENAs over a larger energy range and more frequently than IBEX, helping scientists better map the ribbon.

DUST AND INTERSTELLAR NEUTRALS

IMAP collects dust and interstellar neutral atoms originating from outside our solar system to help us understand other stars, and the local neighborhood beyond our cosmic shield.



SOLAR PARTICLES AND SPACE WEATHER

IMAP instruments monitor and measure charged particles coming from the Sun, as well as other energetic charged particles created throughout the heliosphere. These data, along with magnetic field information, provide a way to continually monitor space weather to protect astronauts, spacecraft, and critical satellite infrastructure.

WHAT IS HELIOPHYSICS?

Heliophysics is the study of the Sun—reflected in IMAP's solar panels—and how it influences planets, the very nature of space, and our technology.