National Aeronautics and Space Administration

IRIS

Above: Photo of the chromosphere taken by Luc Viatour during the total eclipse of 1999

1 IRIS advances our understanding of how the enigmatic interface region on the sun powers its dynamic million-degree atmosphere called the corona.

2 IRIS contributes to our understanding of the energy flow that is deposited in the interface region, with only a fraction leaking through to drive solar wind that fills the heliosphere.

3 IRIS improves our understanding of the interface region where most of the sun's ultraviolet emission is generated that impacts the near-Earth space environment and Earth's climate.

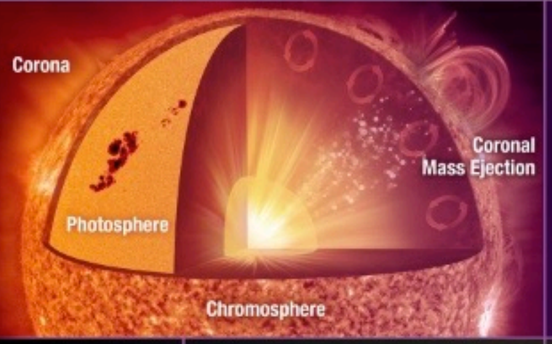
Our Sun

Only the Sun's outer layers, or the solar atmosphere, can be observed directly. There are three distinct regions to the solar atmosphere: the photosphere, the chromosphere, and the corona.

Interface Region Imaging Spectrograph

IRIS will strive to understand how the solar atmosphere is energized.

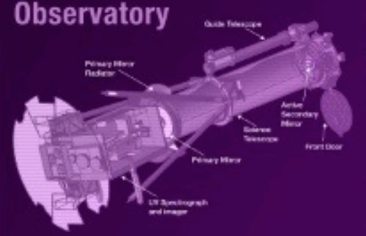
The Interface Region Imaging Spectrograph (IRIS) is a NASA Small Explorer Mission to observe a region that lies between the sun's ten thousand degree, white-hot, visible surface, the photosphere, and the much hotter multi million-degree outer atmosphere of the sun, the corona. Known as the solar interface region, this is one of the most complex areas in the sun's atmosphere: all the energy that drives solar activity travels through it. IRIS will observe how solar gases move, gather energy, and heat up through the interface region, information that is key to understanding what heats the sun's corona.



The Interface Region

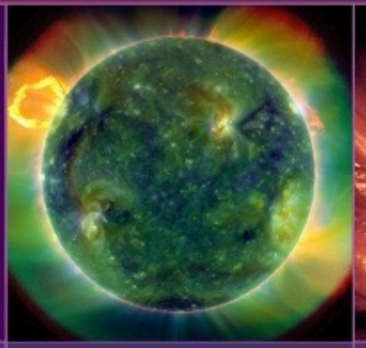
The sun's dynamically changing chromosphere and transition region make up the key "interface region" that IRIS will study that lies between the photosphere and corona.

IRIS Observatory



The Spacecraft

This cutaway diagram shows the IRIS spacecraft components, without solar panels for clarity. The IRIS spacecraft will orbit Earth and use its ultraviolet telescope to obtain high resolution images and spectra of the interface region.



UV Spectra

This ultraviolet image of the sun was taken by the Solar Dynamics Observatory (SDO). False colors trace different gas temperatures. Reds being cooler and blues hotter. IRIS will use a similar process to image the chromosphere.

Solar Plasma

The reason for the high temperature of the bright glowing gas flowing around the sunspots (bright area near the horizon) is unknown, but thought to be related to the rapidly changing magnetic field loops that channel solar plasma through the chromosphere.

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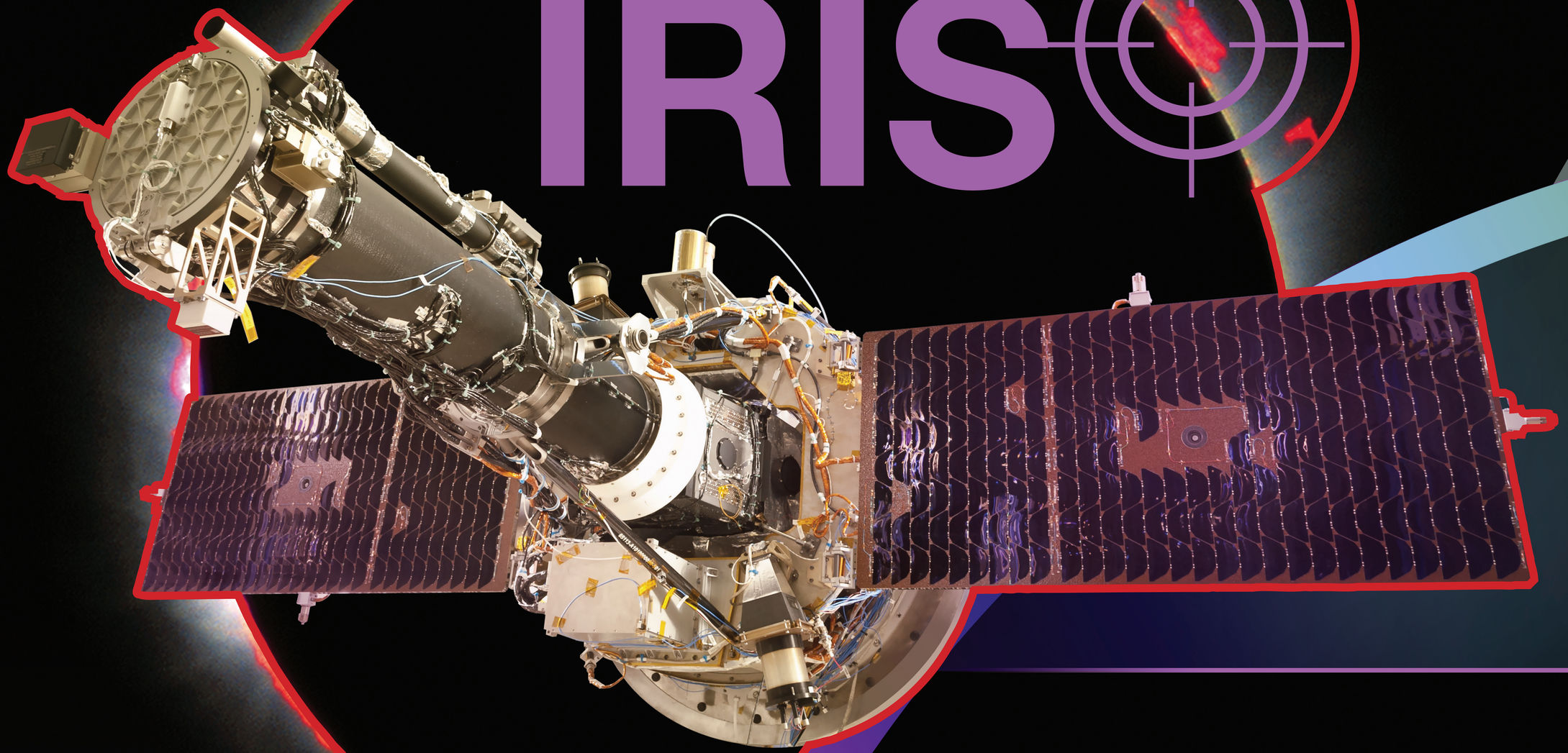
IRIS



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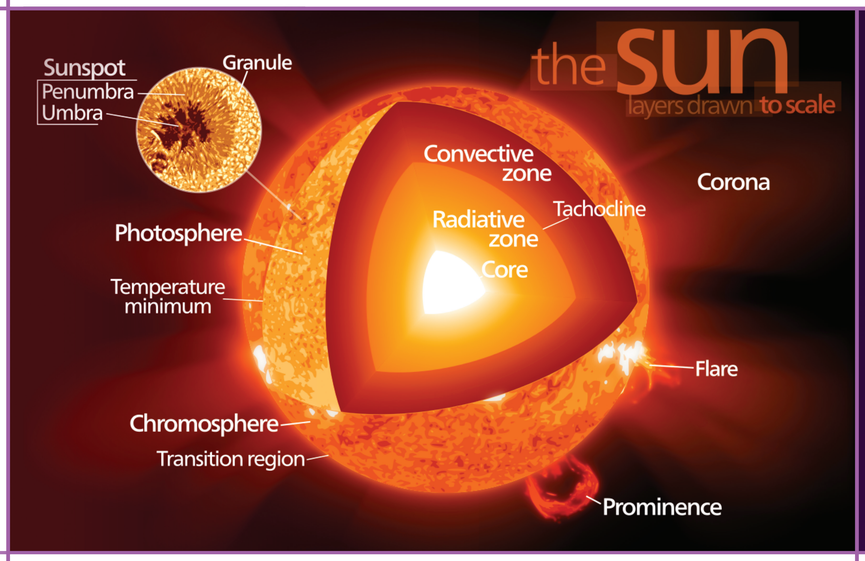
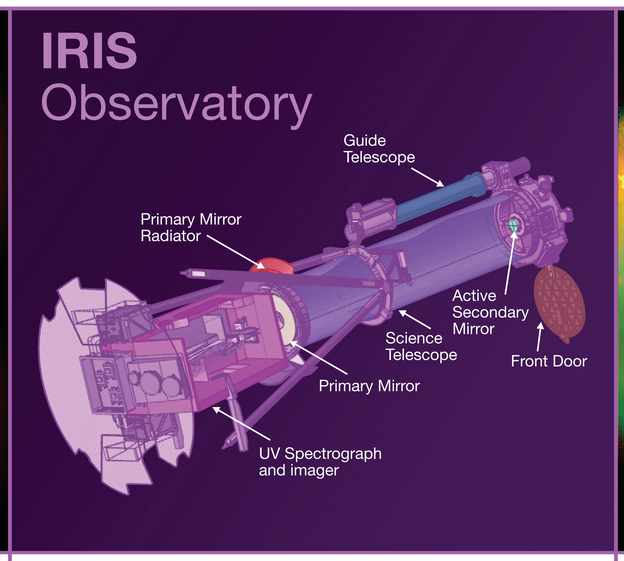
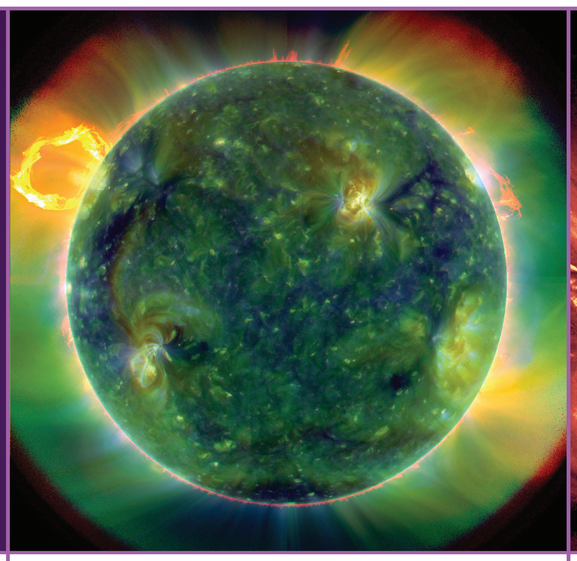
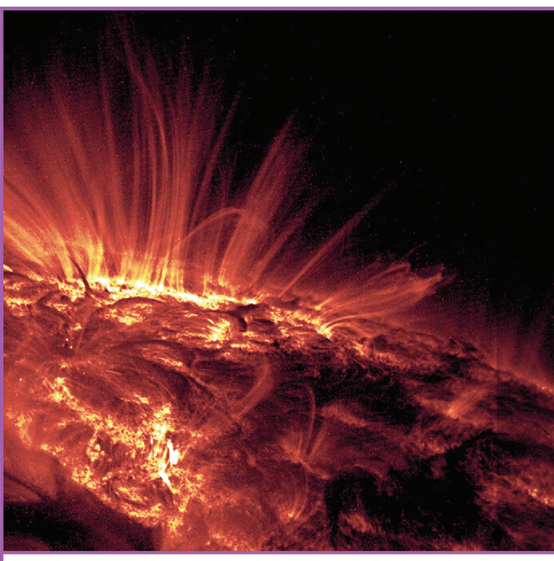

the sun
layers drawn to scale
Sunspot
Penumbra
Umbra
Granule
Convective zone
Radiative zone
Tachocline
Core
Corona
Photosphere
Temperature minimum
Flare
Chromosphere
Transition region
Prominence


IRIS
Observatory
Guide Telescope
Primary Mirror Radiator
Active Secondary Mirror
Science Telescope
Front Door
Primary Mirror
UV Spectrograph and imager





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