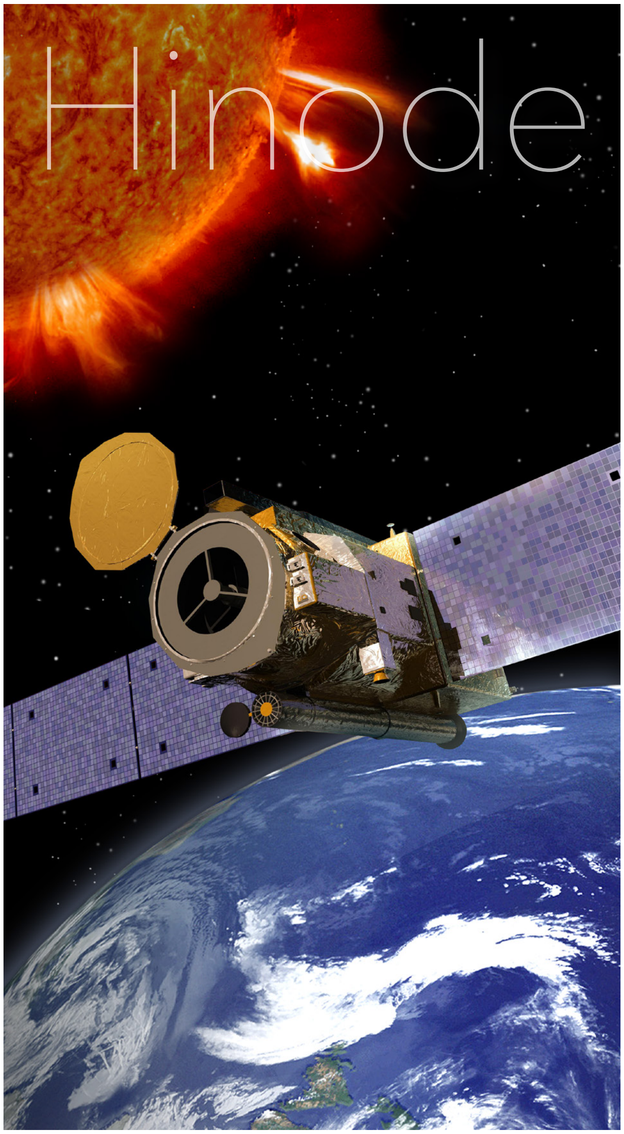
National Aeronautics and Space Administration

HINODE



Hinode During the Eclipse

While the United States experiences a solar eclipse, the JAXA/NASA Hinode mission will observe a partial lunar transit near the same time as the observers on the ground. Hinode will watch the transit through its X-ray Telescope, called XRT, which can view the entire Sun at once.

Watching a solar eclipse—using appropriate instruments to protect the eyes since you should never look at the Sun directly—is a crucial way of seeing the dim structures around the edges of the Sun normally obscured by the brightness of the Sun itself. Indeed it was during eclipses that scientists first observed the Sun's atmosphere, the corona, which extends beyond the more easily seen surface, known as the photosphere.

The XRT instrument is optimal for viewing the hot corona, and these images can provide context images for ground-based eclipse observations. Eclipse scientists correlate the two sets of observations to determine where the emissions seen from the ground originate from the Sun itself. One study will look at X-ray jets—explosions that erupt from the Sun's surface, expelling hot gas into the corona—on the limb to determine where they occur more commonly. This research is best accomplished with the view of the lower corona that can be seen only during a total solar eclipse.

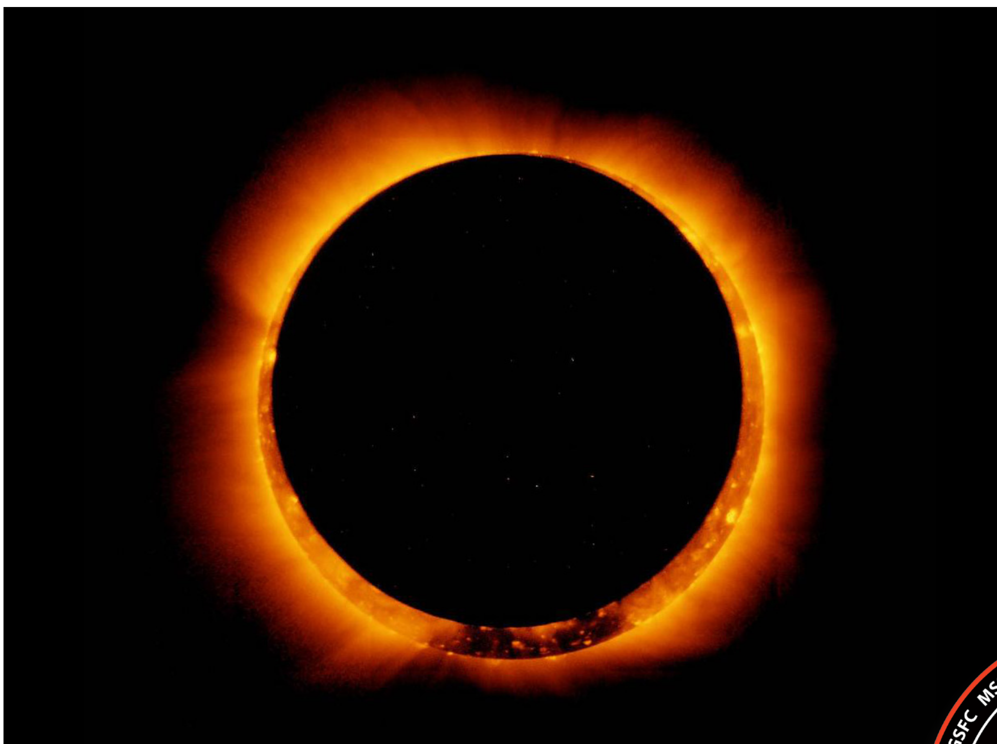
Eclipse imagery from Hinode will be available on Aug. 22, 2017.

Focusing on a Magnetic Sun

Hinode explores the magnetic fields of the Sun in order to improve understanding of what powers the solar atmosphere and drives solar eruptions. Hinode's Solar Optical Telescope is the first space-borne instrument to measure the strength and direction of the Sun's magnetic field on the Sun's surface, the photosphere. Combined with two other Hinode instruments, the EUV imaging spectrometer, or EIS, and the X-ray/EUV telescope, or XRT, the mission is designed to understand the causes of eruptions in the solar atmosphere and relate those eruptions to the intense heating of the corona and the mechanisms that drive the constant out ow of solar radiation, the solar wind.

Hinode lies in a Sun-synchronous orbit around Earth at an altitude of nearly 400 miles (a little under 650 km). Its orbit allows Hinode to observe the Sun continuously for nine months at a time. During the summer (in the northern hemisphere) Hinode experiences an "eclipse season" during which the Sun is eclipsed by Earth—as opposed to the Moon as will happen on Aug. 21—for a maximum of ten minutes in each 98-minute orbit.

Led by the Japan Aerospace Exploration Agency, or JAXA, the Hinode mission is a collaboration between the space agencies of Japan, the United States, the United Kingdom and Europe.



On Jan. 4, 2016, the Hinode satellite captured this breath-taking image of an annular solar eclipse. An annular eclipse occurs when the Moon, slightly more distant from Earth than on average, moves directly between Earth and the Sun, thus appearing slightly smaller to observers' eyes.
Credit: Hinode/XRT

ADDITIONAL RESOURCES:

Mission Project Home Page: *https://hinode.msfc.nasa.gov/*

Hinode News: *http://nasa.gov/hinode*

Hinode Data: *https://hinode.msfc.nasa.gov/data_archive.html*

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