Solar Dynamics Observatory

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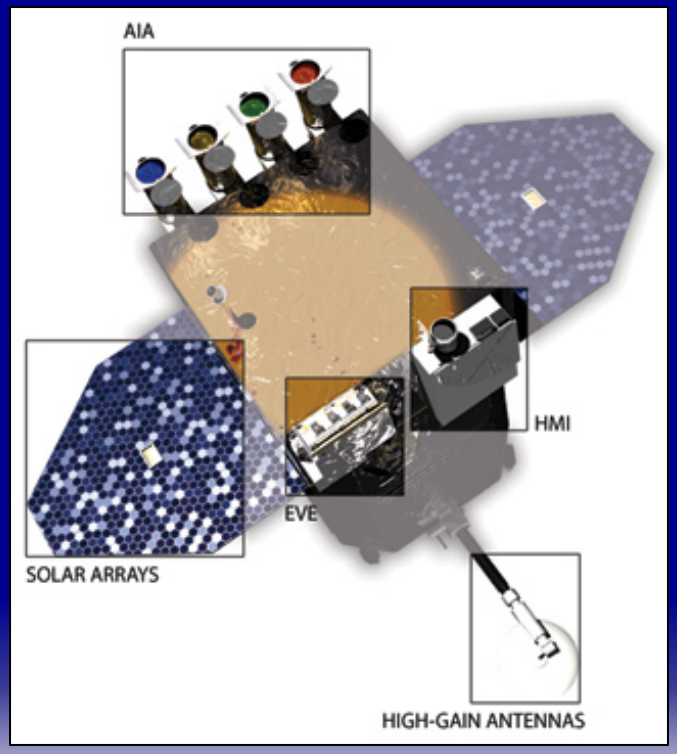
- The newest mission in the Living with a Star solar study program.



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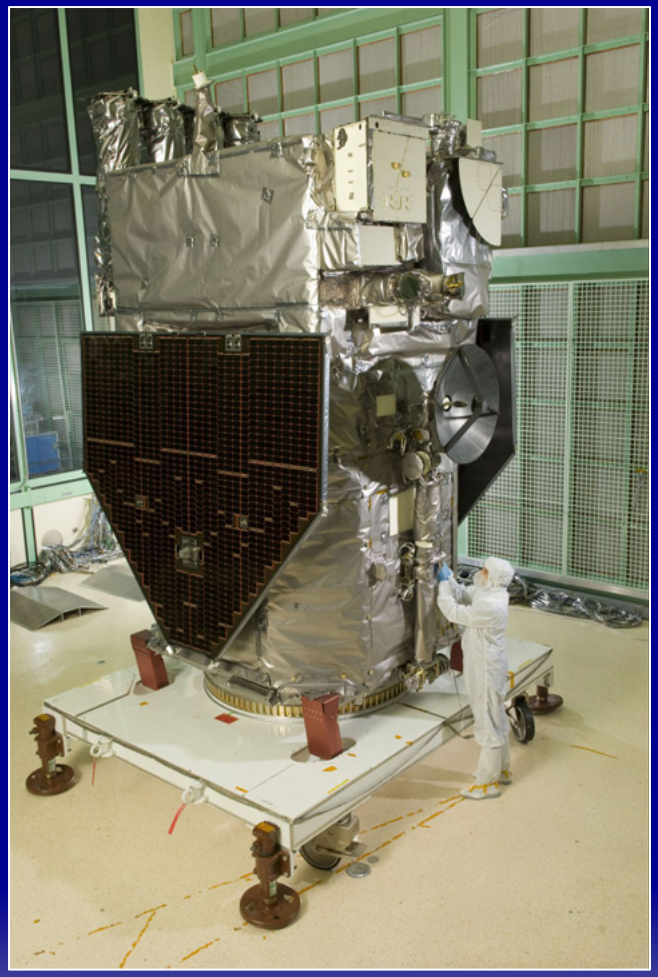


SDO under construction

SDO launch

- SDO was launched Feb. 11, 2010 from Cape Canaveral by an Ares rocket.

Click on image to play movie

Where is SDO?

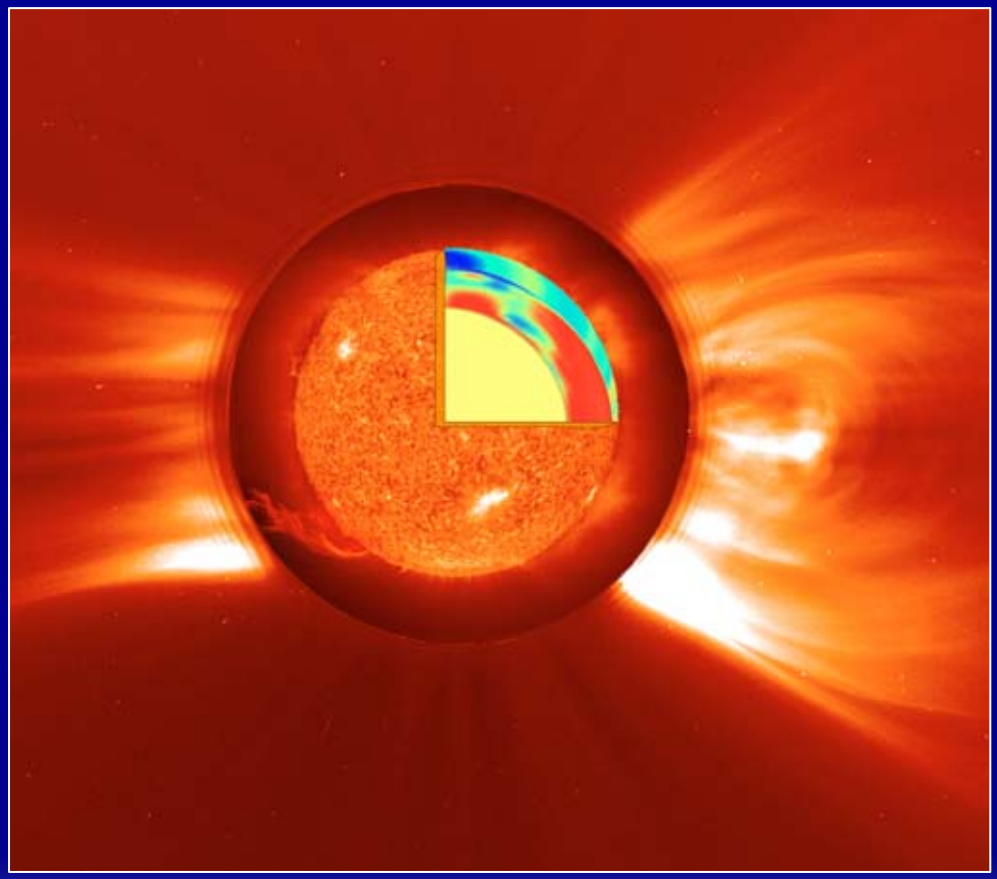
SDO is orbiting around Earth in an elliptical figure-8 orbit about 22,000 miles high.

It sends its data down to its own ground station in White Sands, NM – so that we get images on the web in about 90 minutes.

What will SDO study?

SDO will study how solar activity is created and how “space weather” comes from that activity.

SDO will simultaneously measure the interior of the Sun, the Sun's magnetic field, the hot plasma of the solar corona, and solar irradiance.



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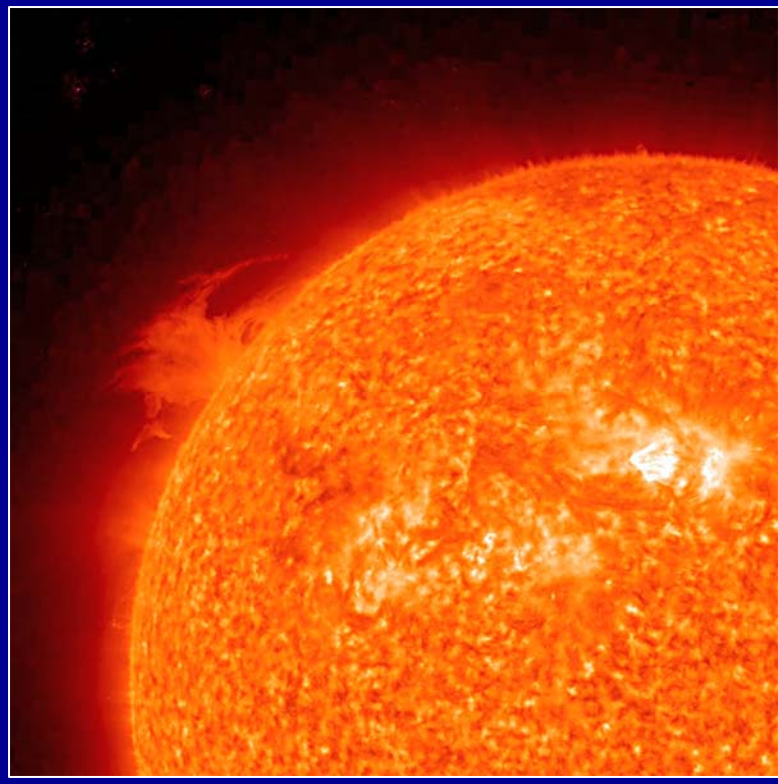
- On April 21, 2010, the world saw the most detailed images of the full Sun ever taken.

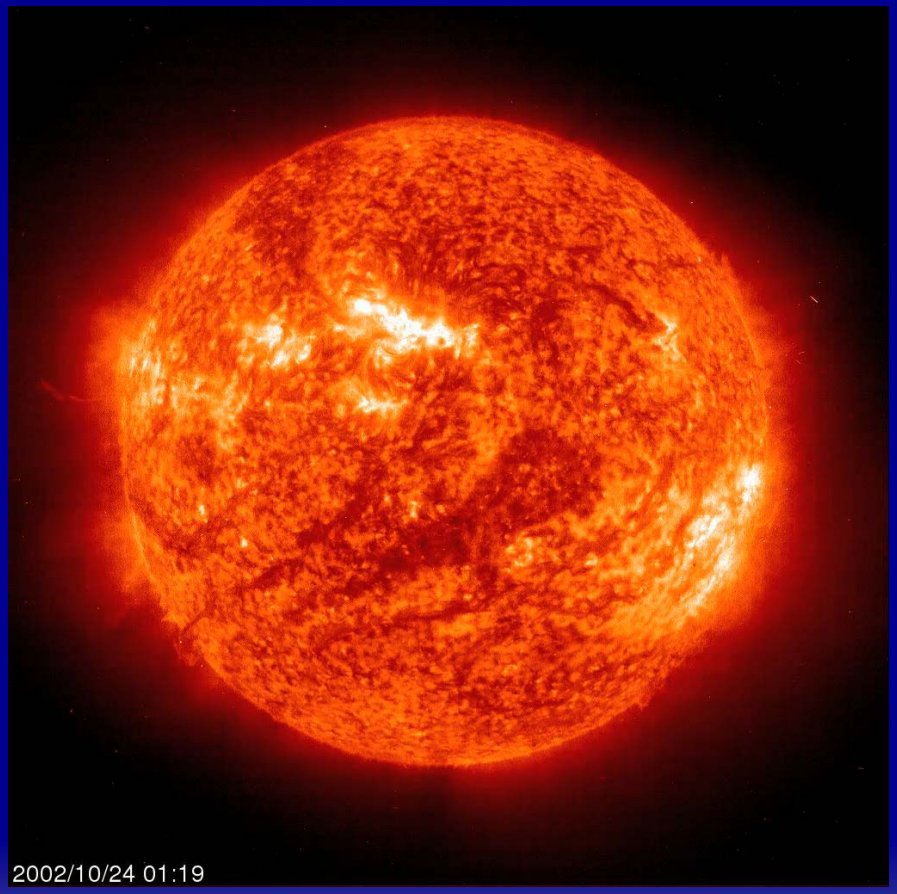
- SDO's images are 4096 x 4096 pixels, more detailed than Super HD, twice as much as this STEREO mission image.



Credit: STEREO/NASA

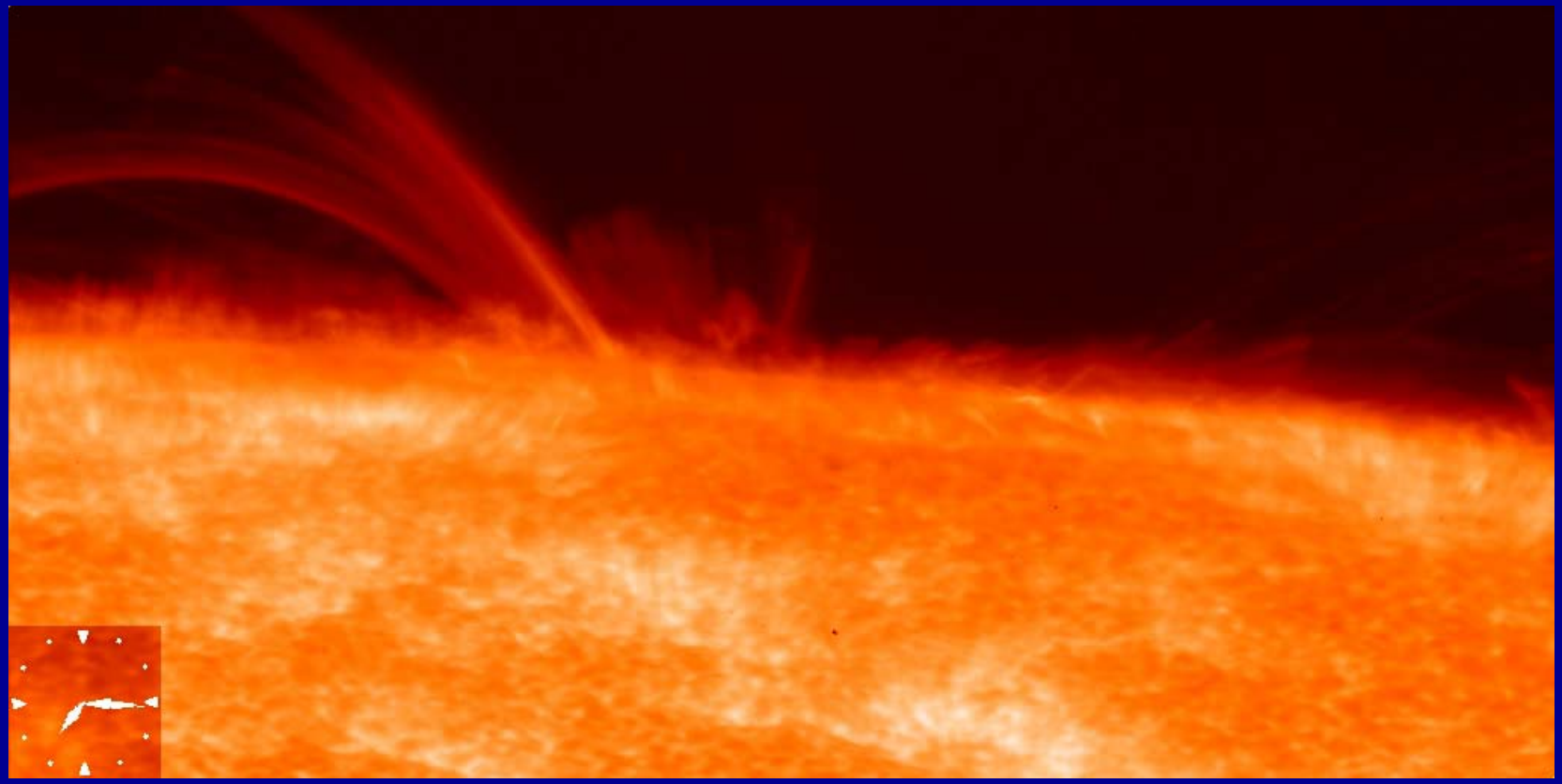
The Sun is Changing All the Time

- On all scales, the Sun is in constant change. This movie (from the SOHO mission) shows a busy Sun over three days in extreme UV light.



Click on image to play movie

Credit: SOHO/NASA



Click on image to play movie

Sample close-up video from the Hinode mission – high resolution but only for a very small area.

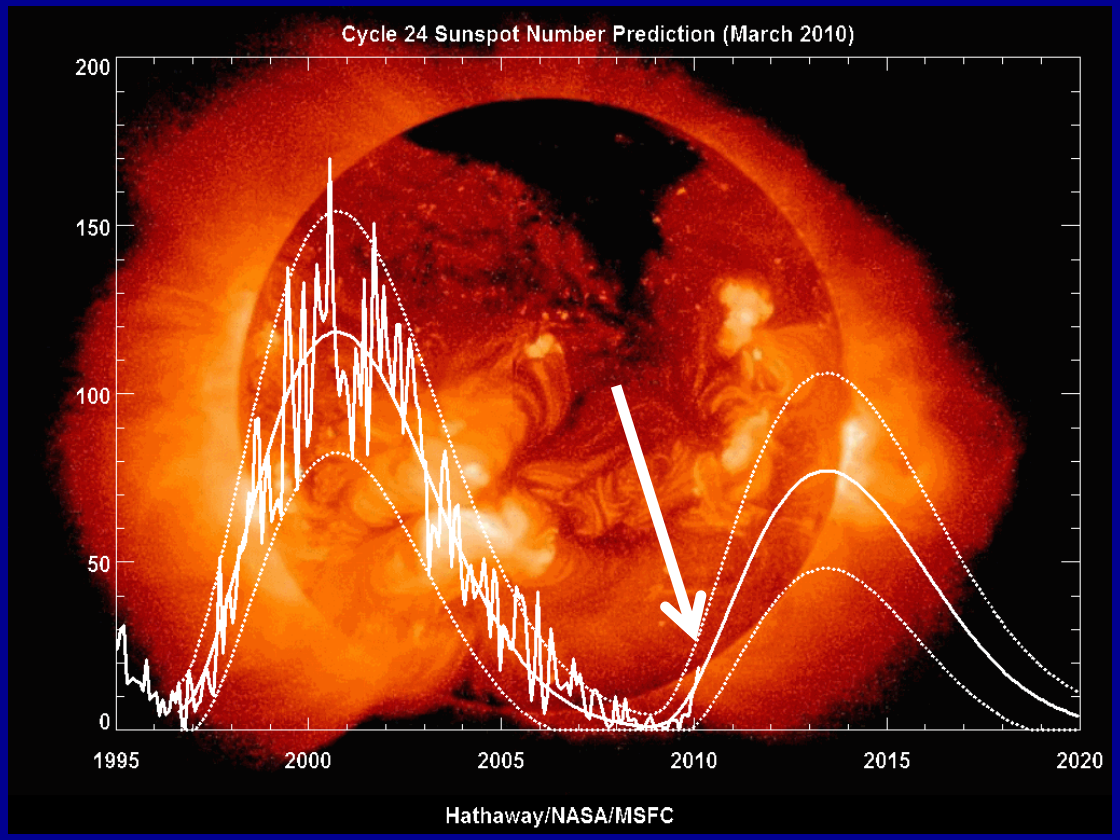
What else makes SDO special?

SDO has more sensitive instruments that will give us more frequent and more detailed images and data we have never had before.

SDO takes an image almost every second: that's 1.5 terabytes per day!

How much does the Sun change?

The Sun is changing all the time. It goes through an 11-year cycle of sunspot activity. And its surface is a dynamic region where magnetic forces often pull at each other and sometimes blast solar storms into space. Its energy output can vary as well.



Sunspot numbers and predictions

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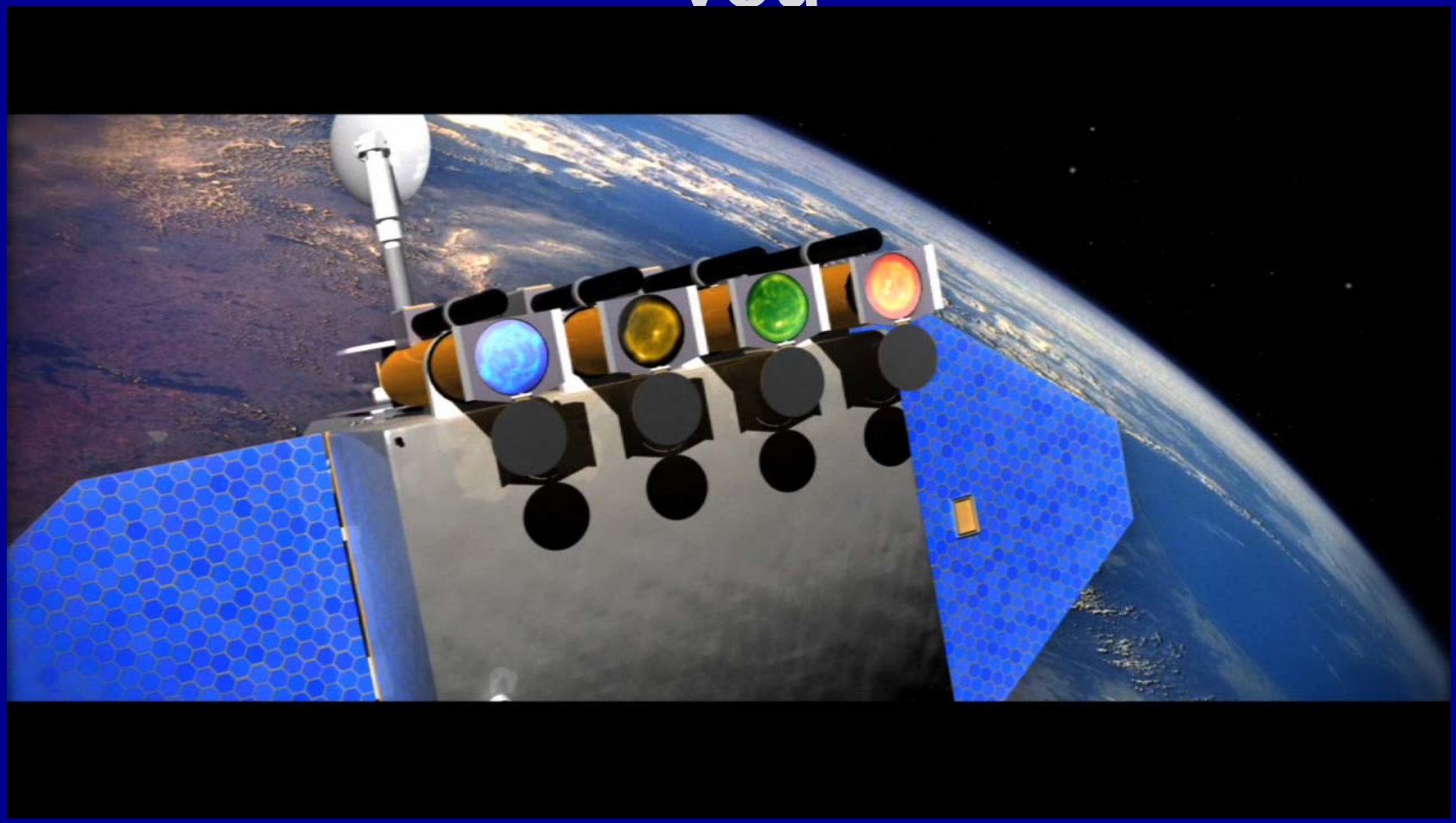
Watch how we get the data to vou



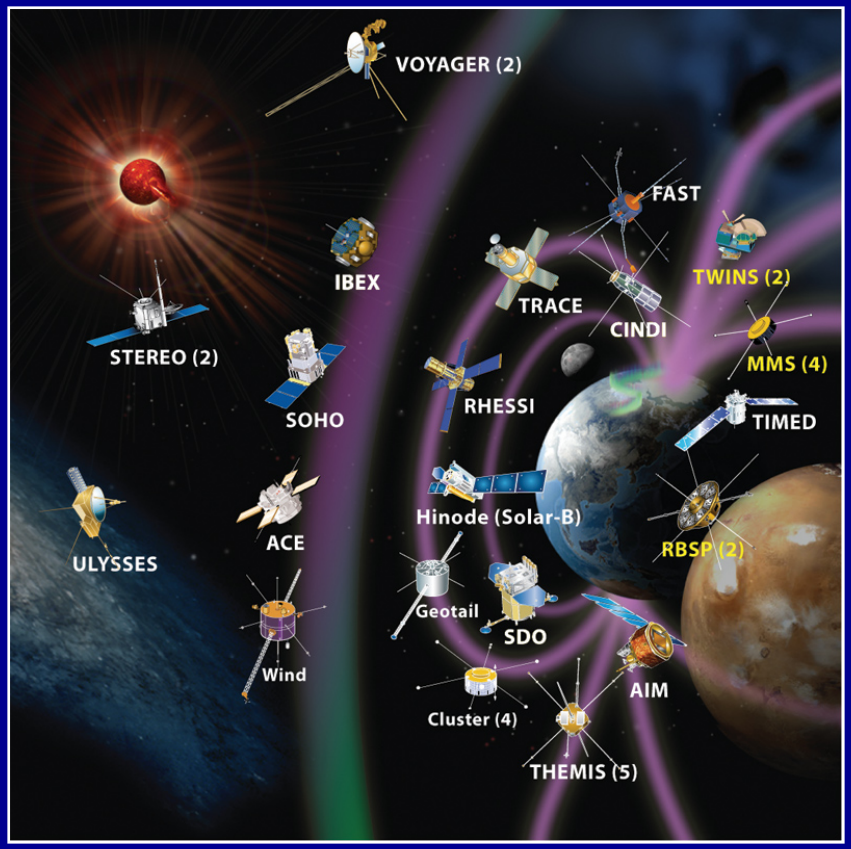
Click on image to play movie

Why does NASA study the Sun?

- The Sun is a dynamic magnetically active star

- Its storms influence life on Earth and our technology.
  - Solar flares and coronal mass ejections can disable satellites, cause power grid failures, and disrupt GPS communications.

- We want to understand its processes and be able to predict these storms



Part of NASA's fleet of solar study spacecraft