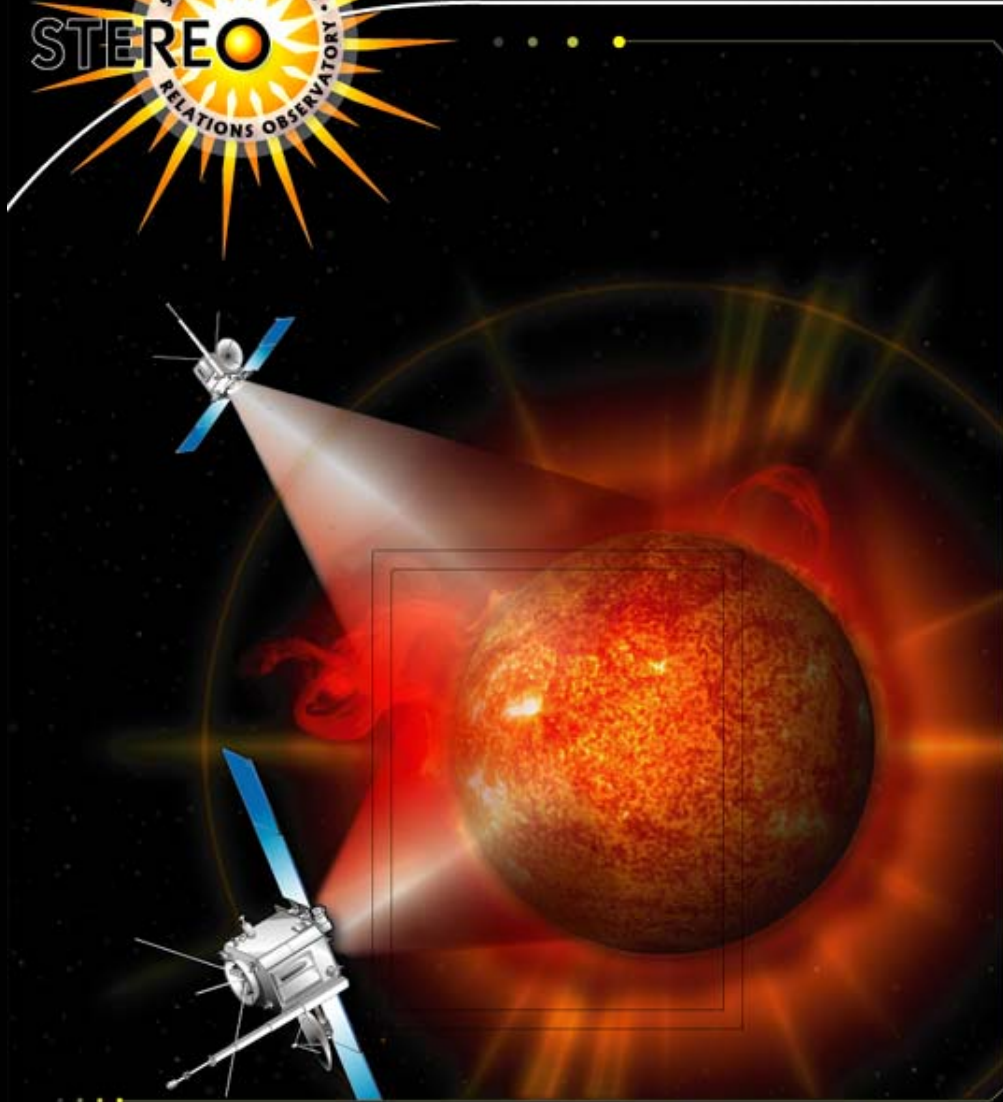


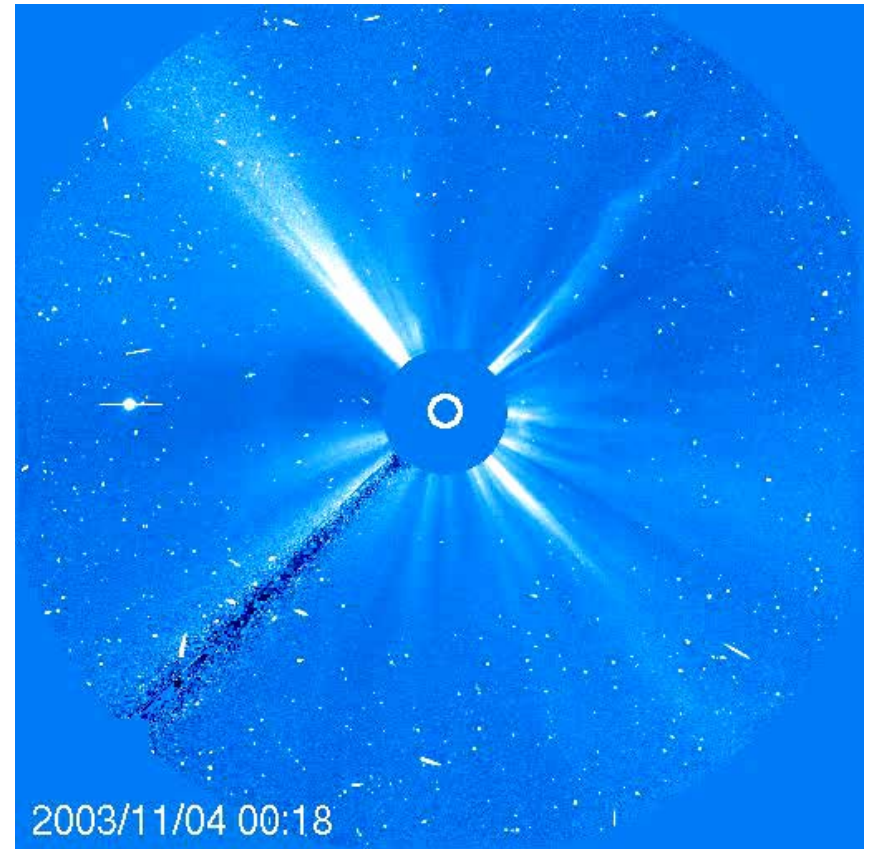
THE SUN LIKE IT'S NEVER
BEEN SEEN BEFORE!
..IN 3D..



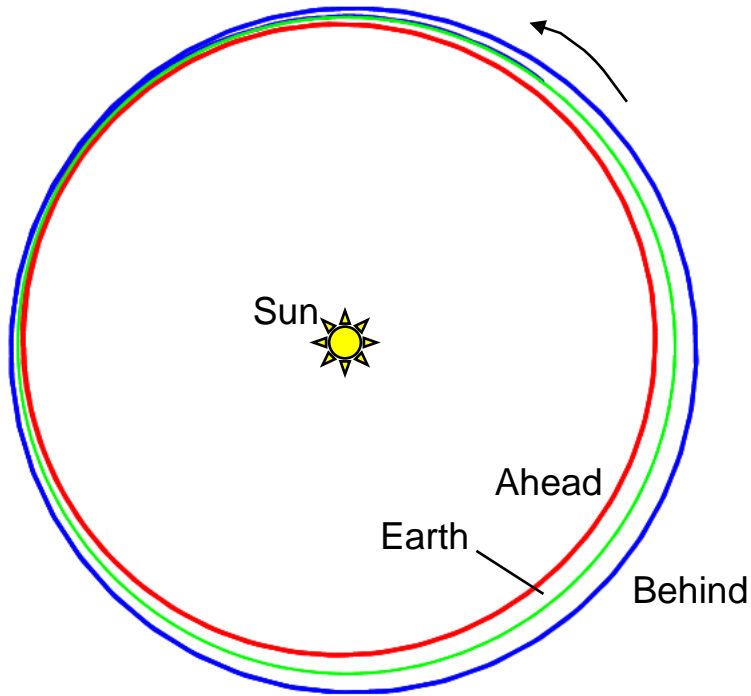
Michael L. Kaiser
STEREO Project Scientist
NASA/Goddard Space Flight Center

Science Objectives

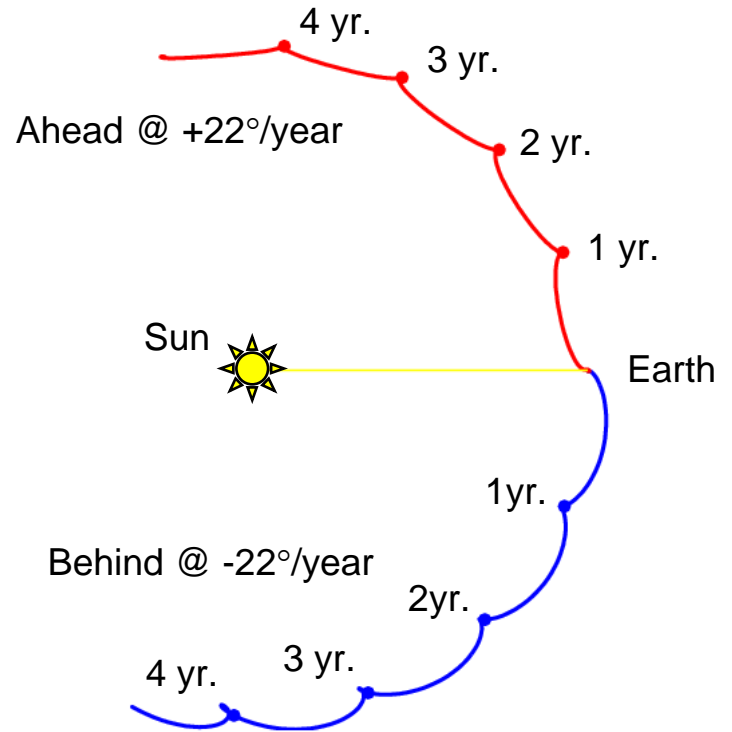
1. Understand the causes and mechanisms of Coronal Mass Ejection (CME) initiation
2. Characterize the propagation of CMEs through the heliosphere
3. Discover the mechanisms and sites of energetic particle acceleration in the low corona and the interplanetary medium
4. Develop a 3D time-dependent model of the magnetic topology, temperature, density, and velocity structure of the ambient solar wind



Mission Orbit



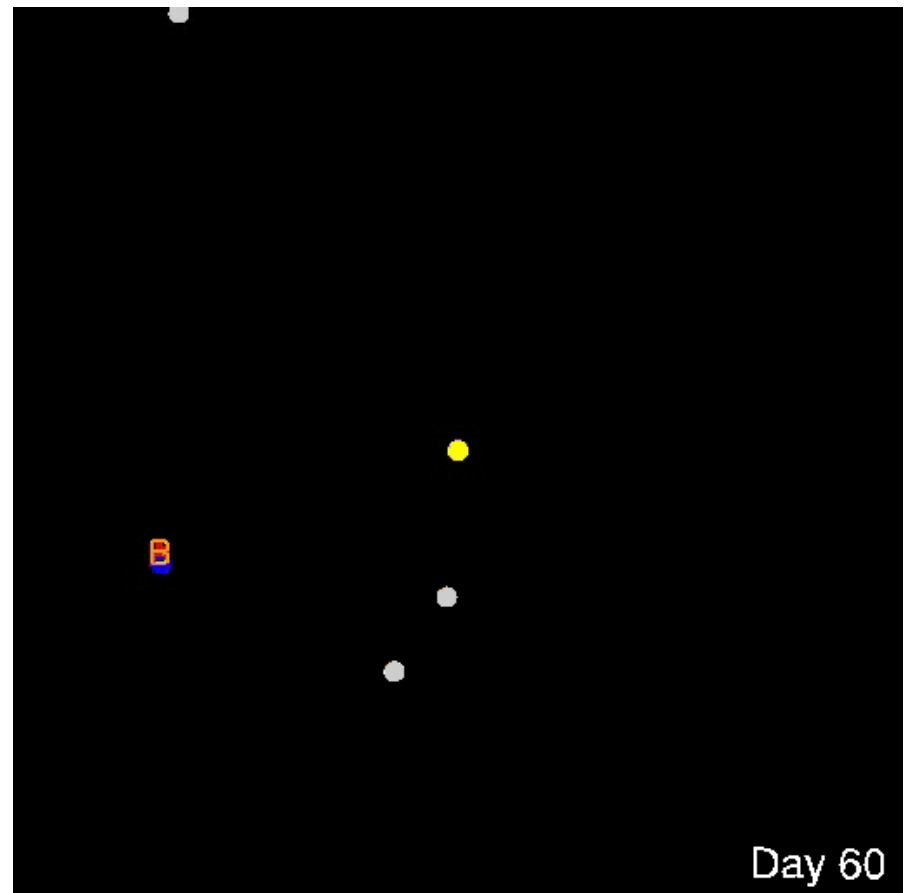
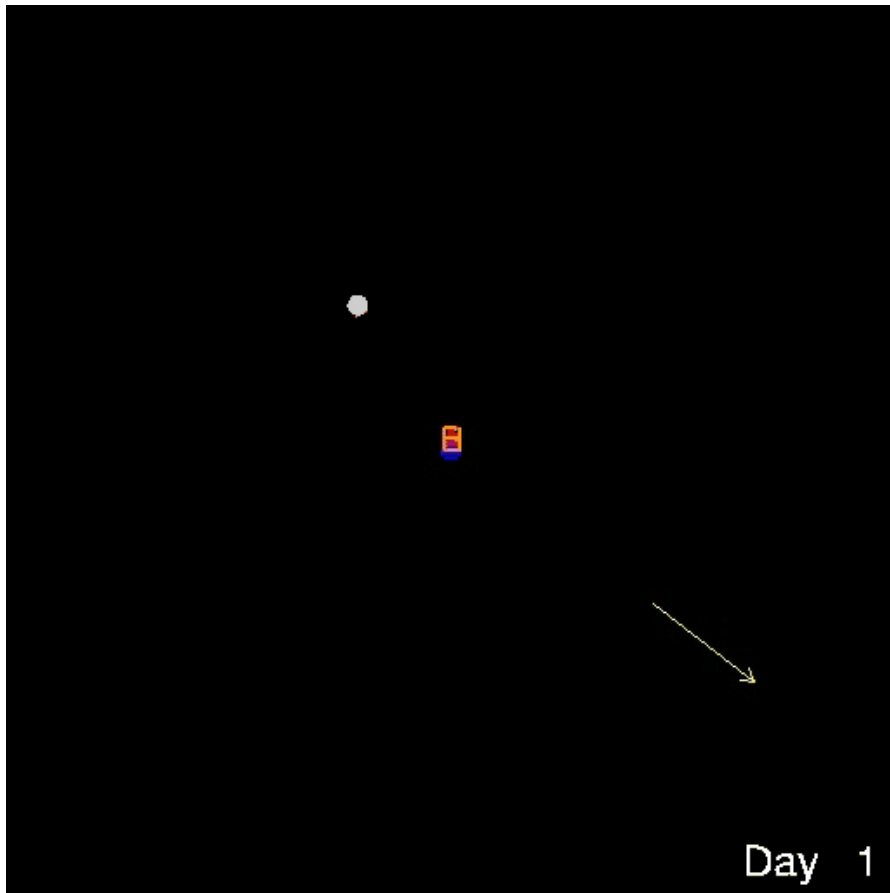
Heliocentric Inertial Coordinates
(Ecliptic Plane Projection)



Geocentric Solar Ecliptic Coordinates
Fixed Earth-Sun Line
(Ecliptic Plane Projection)

STEREO

Getting there is half the fun



STEREO INSTRUMENTS

SECCHI- Track Coronal Mass Ejections (CMEs) Sun to Earth.

PI – Russ Howard, NRL

- Two White Light Coronagraphs (**COR1,COR2**)- 1.4 – 15 R_{sun}
- Extreme Ultra Violet Imager (**EUVI**)- Chromosphere and inner corona
- Heliospheric Imager (**HI1, HI2**)- 12 – 300 R_{sun}

IMPACT- 3-D distribution of solar wind electrons, energetic particle ions and electrons, and magnetic field.

PI – Janet Luhmann, UC Berkeley

- Solar Wind Experiment (**SWEA**)-Electrons ~0-3 keV with wide angle coverage
- Suprathermal Electron Telescope (**STE**)-Electrons 2-100 keV with wide angle coverage
- Magnetometer Experiment (**MAG**)-Vector magnetic field at 65,536 nT and 500 nT ranges
- Solar Energetic Particle Experiment (**SEP**) Suite
 - Electrons 0.02-6 MeV
 - Protons 0.02 – 100 MeV
 - Helium ions 0.03 – 100 MeV/nucleon
 - Heavier ions 0.03 – 40 MeV/nucleon

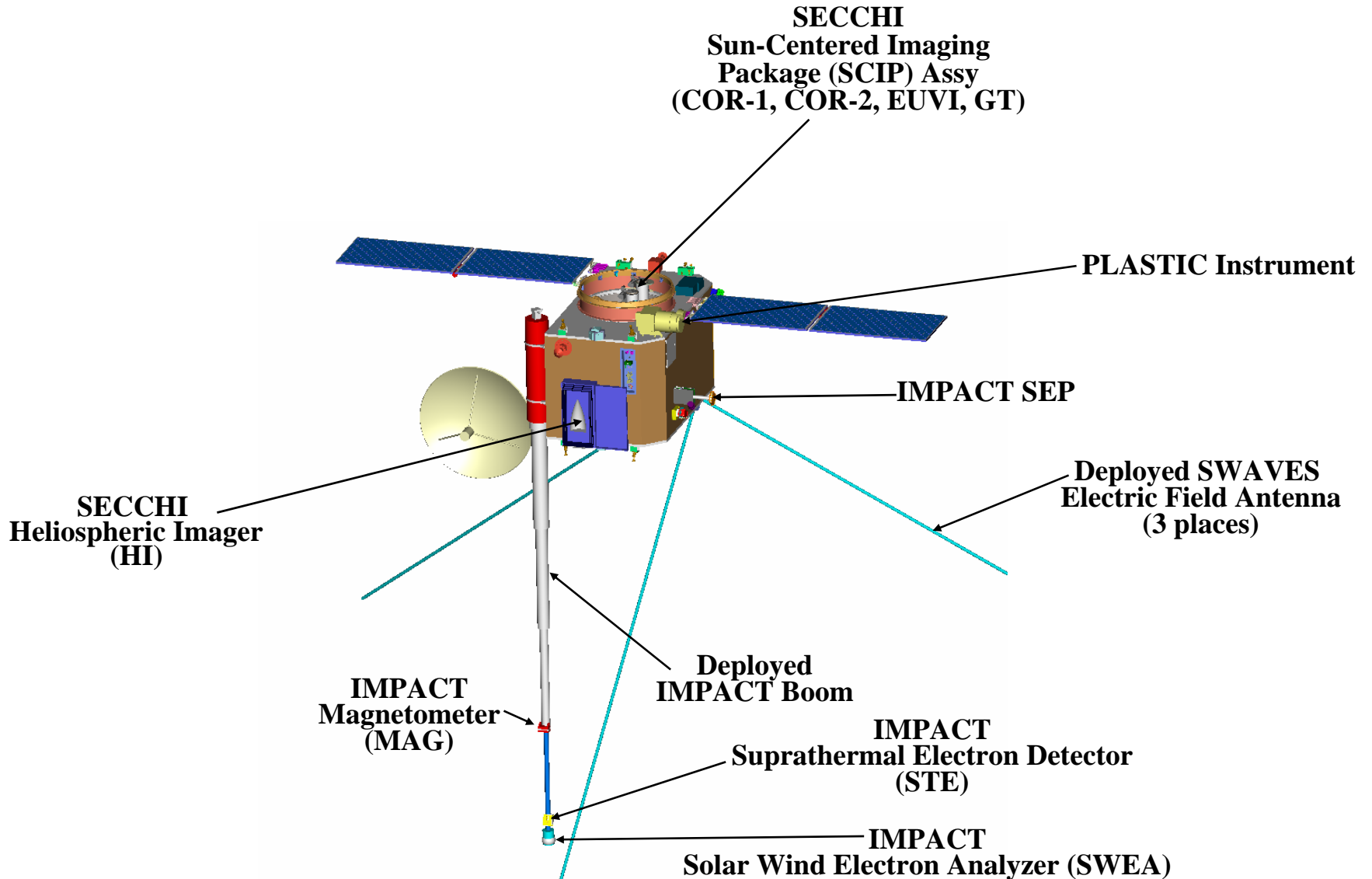
PLASTIC- Protons, alpha particles, and heavy ion and composition measurements of heavy ions

PI – Toni Galvin, UNH

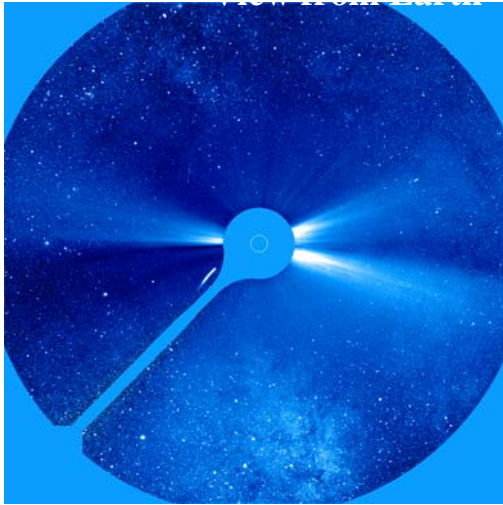
SWAVES- in-situ as well as remote sensing instrument. Tracks CME Driven Shocks from the Corona to the Earth.

PI – J-L Bougeret, Paris Observatory

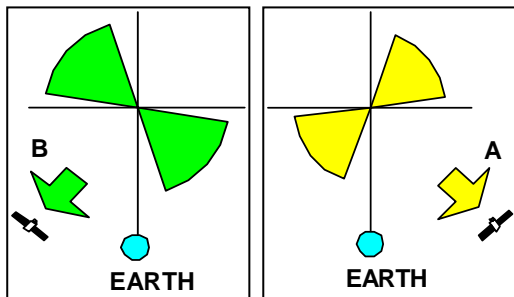
STEREO-B (BEHIND) OBSERVATORY

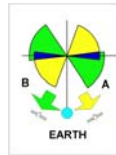
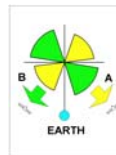
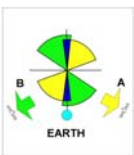


Mission Phases



The surrounding coronal structure is brightest when within ± 30 degrees of the plane of the sky as seen from the spacecraft



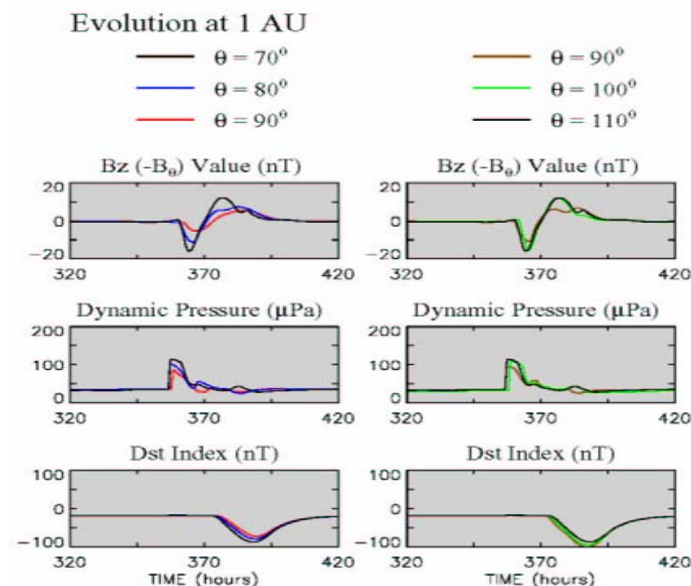
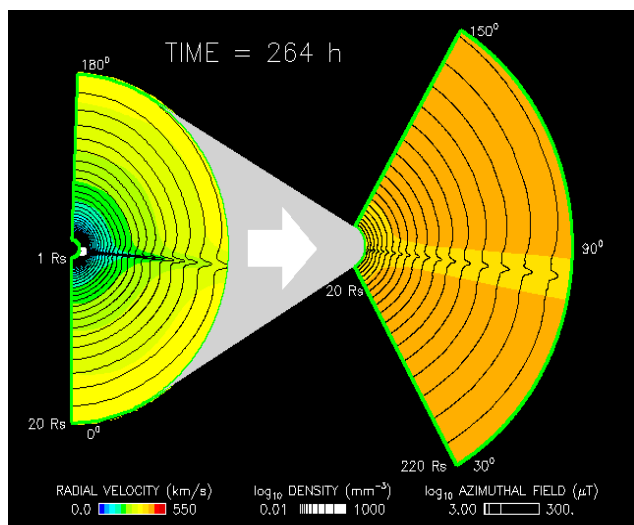
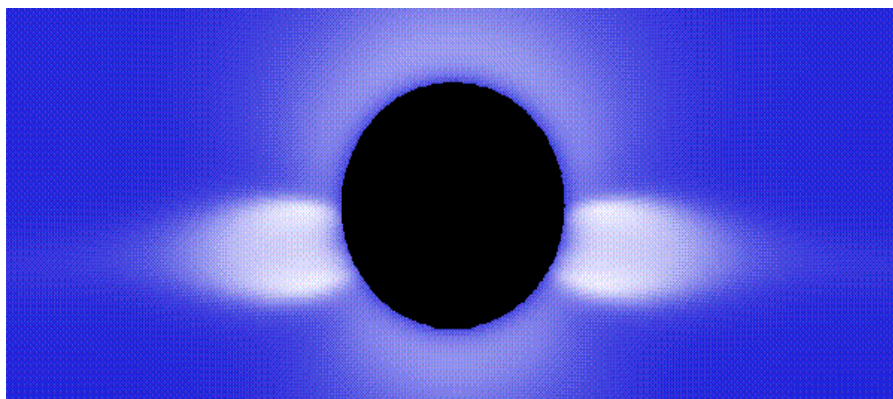
Mission Phase	Remote Sensing	In-Situ
Prime Stereo Science	 <ul style="list-style-type: none"> •Stereo view of plane of sky CMEs and their propagation 	<ul style="list-style-type: none"> •Multipoint observation of Earth directed CMEs
Multipoint Science	 <ul style="list-style-type: none"> •Halo and limb CMEs and their propagation •SWAVES triangulation at its best 	<ul style="list-style-type: none"> •Multipoint observation of Earth directed CMEs
LWS Precursor Science	 <ul style="list-style-type: none"> •Earth directed CMEs 	<ul style="list-style-type: none"> •STEREO-A at quadrature with STEREO-B

Modeling And Theory Efforts

- **Global** – connecting observations of phenomena near the sun (SECCHI/SWAVES) to in situ observations (IMPACT/PLASTIC/SWAVES)
- **Experiment specific**
 - SECCHI
 - 3D reconstruction
 - Evolution/propagation
 - SWAVES
 - Triangulation
 - Evolution/propagation
 - IMPACT/PLASTIC
 - Magnetic cloud structure
 - SEP propagation

STEREO modeling will physically connect in situ observations to images

(shown: SAIC CME model, Linker/ Odstrcil merged CME/Solar Wind model)



Simulated time series

Both the STEREO and SSC websites are up and running

STEREO - Home Page - Netscape

File Edit View Go Bookmarks Tools Window Help

http://stereo.gsfc.nasa.gov/

STEREO - Home Page

3-D VIEW OF THE SUN AND HELIOSPHERE

STEREO

HOME CONTACT SITE

Welcome to the STEREO website!

MISSION
mission
spacecraft
launch
instruments
where is STEREO?

IN THE NEWS
what's new?
current status
newsroom

SCIENCE
space weather
science center

RESOURCES
latest images
gallery
learning center
links

STEREO will use stereoscopic (3-D) vision to construct a global picture of the Sun and its influences.

Its objective is to obtain the necessary measurements and observations to develop a understanding of the fundamental nature and origin of coronal mass ejections - the most energetic eruptions on the Sun and primary cause of major geomagnetic storm

Last Revised: Friday, 27-Aug-2004 15:05:26 EDT
Responsible NASA Official: [Michael L. Kaiser](#)
[NASA IT Security Banner & Privacy Statement](#)
Feedback and comments: [webmaster](#)

STEREO - Meetings - Netscape

File Edit View Go Bookmarks Tools Window Help

http://stereo-ssc.nascom.nasa.gov/meetings.shtml

STEREO - Meetings

STEREO SCIENCE CENTER

SSC

HOME CONTACT SITE MAP

Upcoming meetings

- Science Working Group meetings
 - Dec 18, 2004, Berkeley/SSL (changed date/location)
 - May 2-4, 2005, Hamburg Planetarium, Germany
- STEREO Conferences and Workshops
 - [SH08: Preparing for the Solar STEREO Mission: The 3D, Time-dependent Heliosphere from Models and Observations](#), special session at the [2004 AGU Fall Meeting](#)
- SOHO list of solar [Conferences and Workshops](#)

Past meetings

- [First STEREO Workshop](#)
 - [Presentations](#) from First STEREO Workshop
- Science Working Group meetings (requires password)
 - [December 2003](#)
 - [March 2004](#)

Last Revised: Tuesday, 07-Sep-2004 10:59:46 EDT
Responsible NASA Official: [Michael L. Kaiser](#)
[NASA IT Security Banner & Privacy Statement](#)
Feedback and comments: [webmaster](#)

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ssc
stereo

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meetings
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links

[Intranet](#)

Available Data Products

Beacon (space weather) data – available ‘immediately’

- SECCHI: 7 256 X 256 images every hour
- IMPACT: 1 min averages of **B**, 1 min averages solar wind moments and selected SEP fluxes
- PLASTIC: 1 minute resolution selected moments and fluxes
- SWAVES: 1 minute summaries of selected frequencies

Highest resolution data – available 24-48 hrs

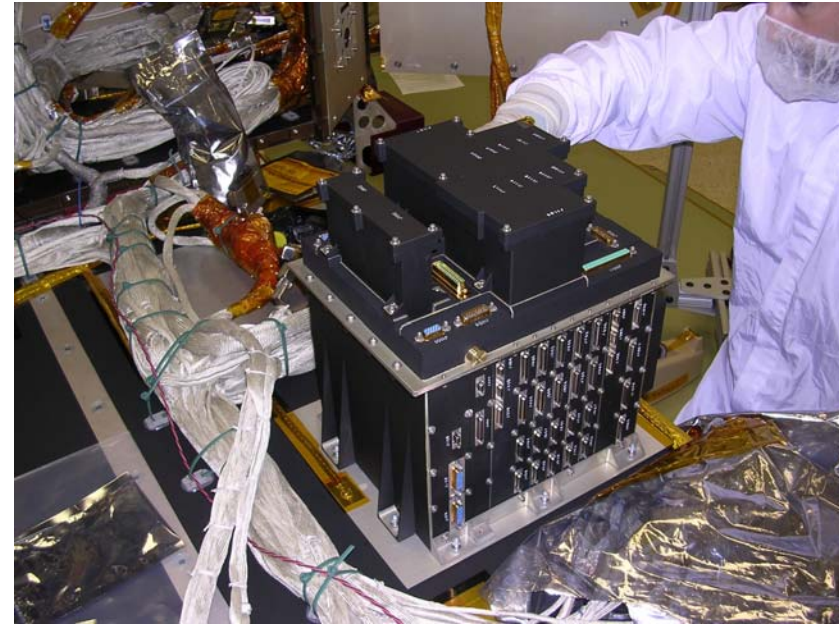
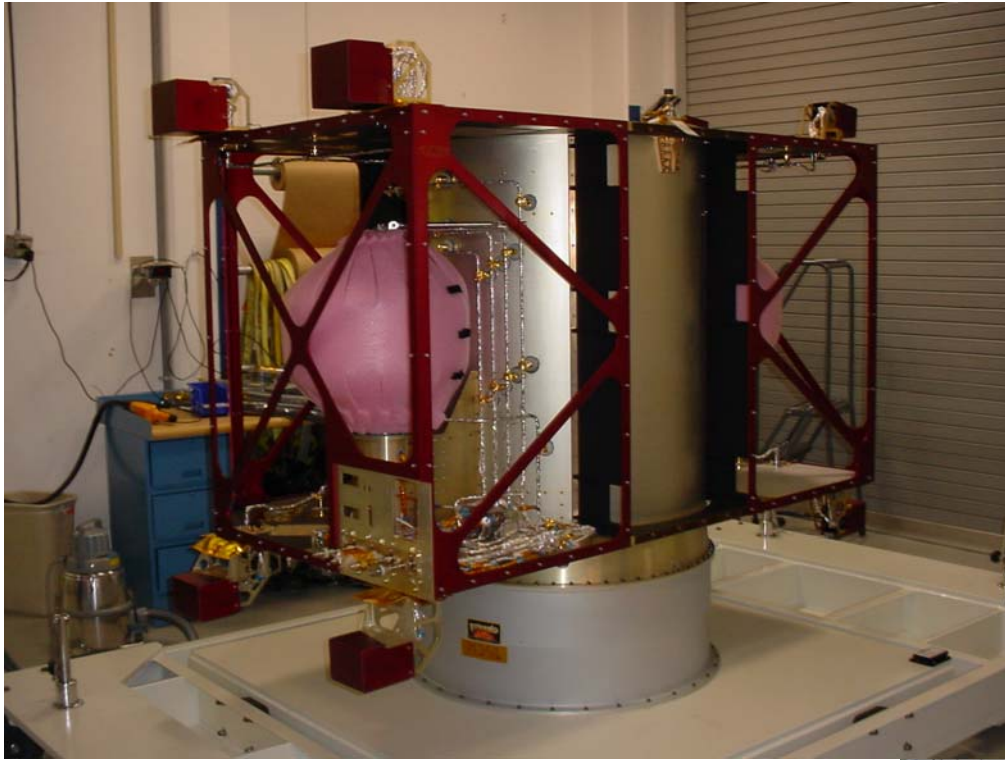
- SECCHI: 2048 X 2048 images
- IMPACT: fluxes (10s sec), moments (few sec) and B (<1 sec)
- PLASTIC: fluxes and moments 1 min resolution
- SWAVES: intensities from all frequencies (~320) every 15 sec

Other data products – available TBD

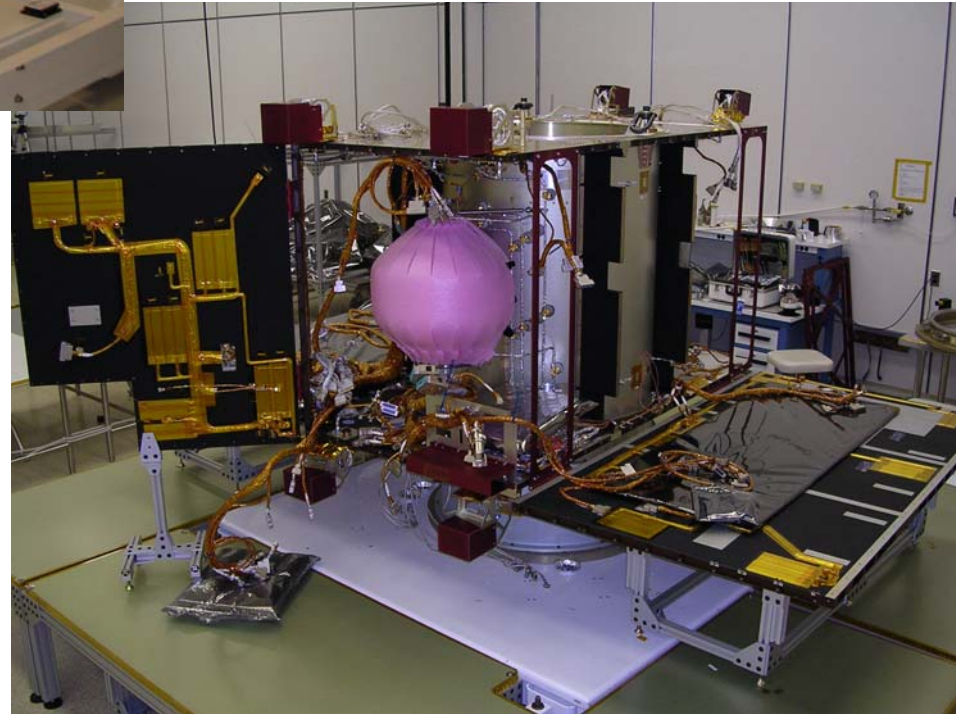
- Key parameters
- Catalogs and event tables
- Movies

STEREO Current Status

- Spacecraft sub-system integration in progress
- Instrument integration begins Jan-Feb 2005
- Launch window opens Feb 11, 2006
~2 week window each month
- Full operation at about launch + 90 days



The spacecrafts come alive!

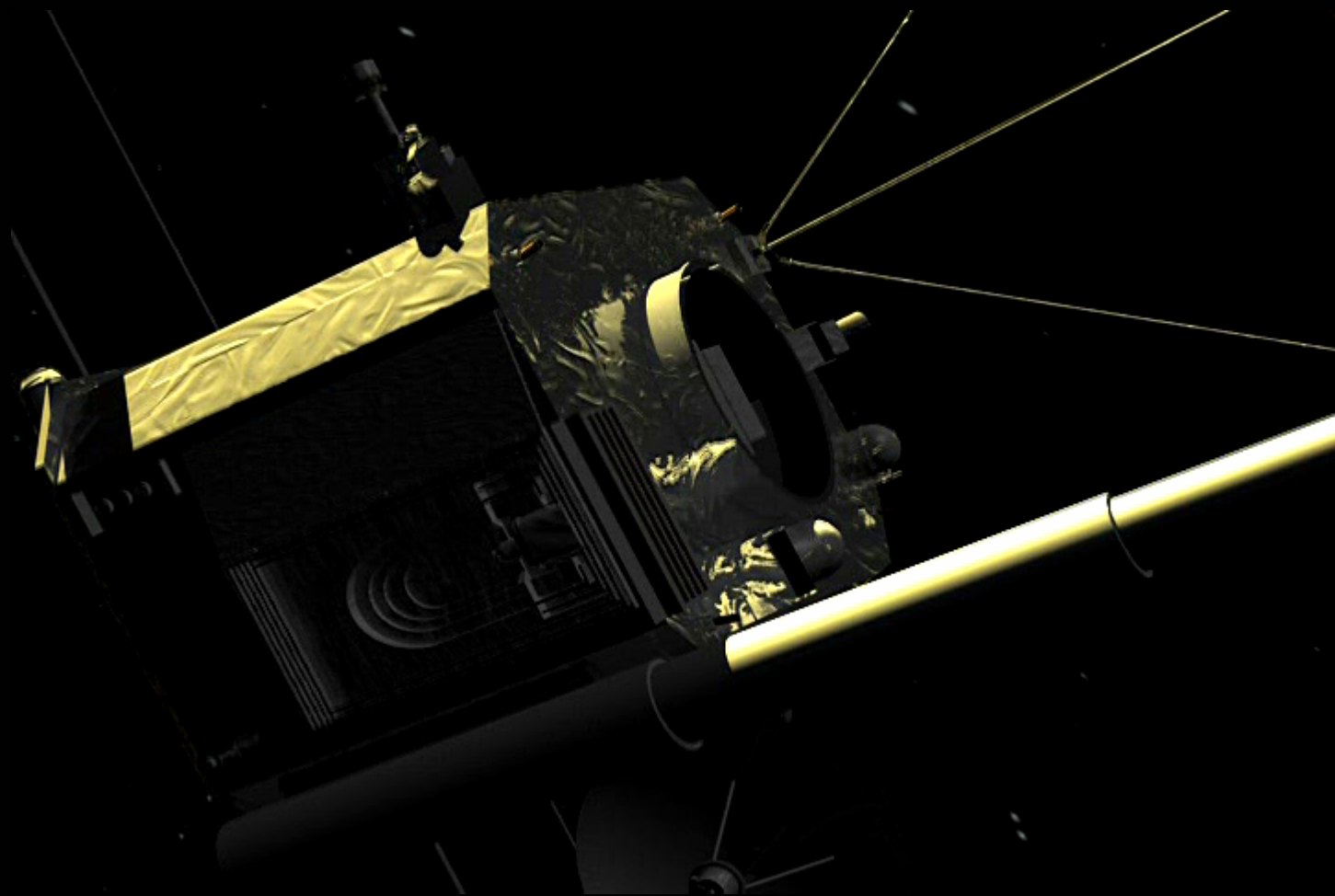


February 11, 2006



Produced by Johns-Hopkins Applied Physics Laboratory

Feb 11, 2006 + ~90 days



Produced by NASA/Goddard Space Flight Center

