

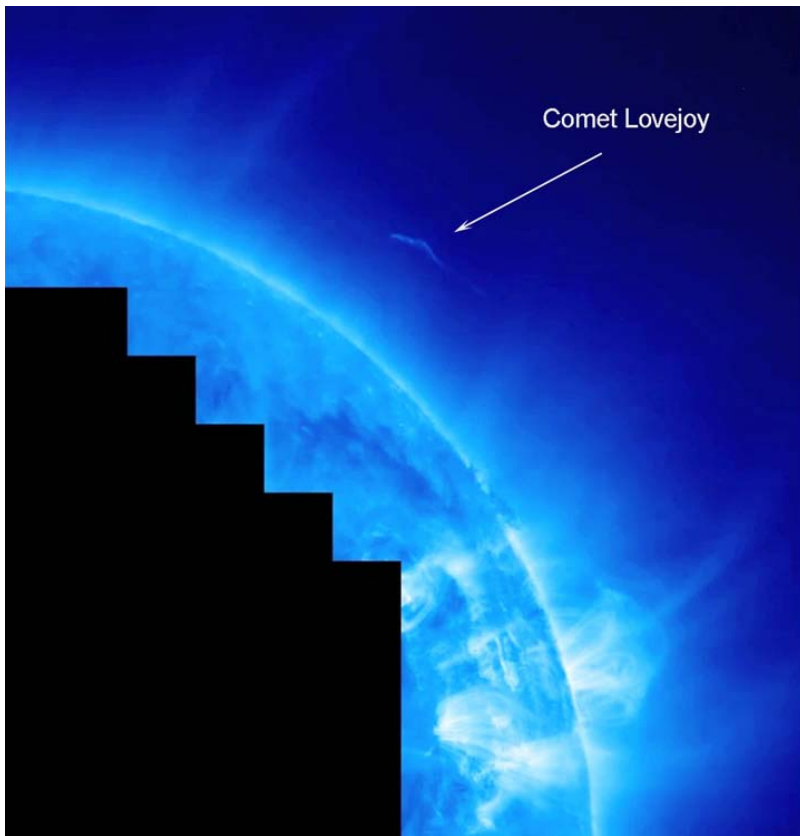
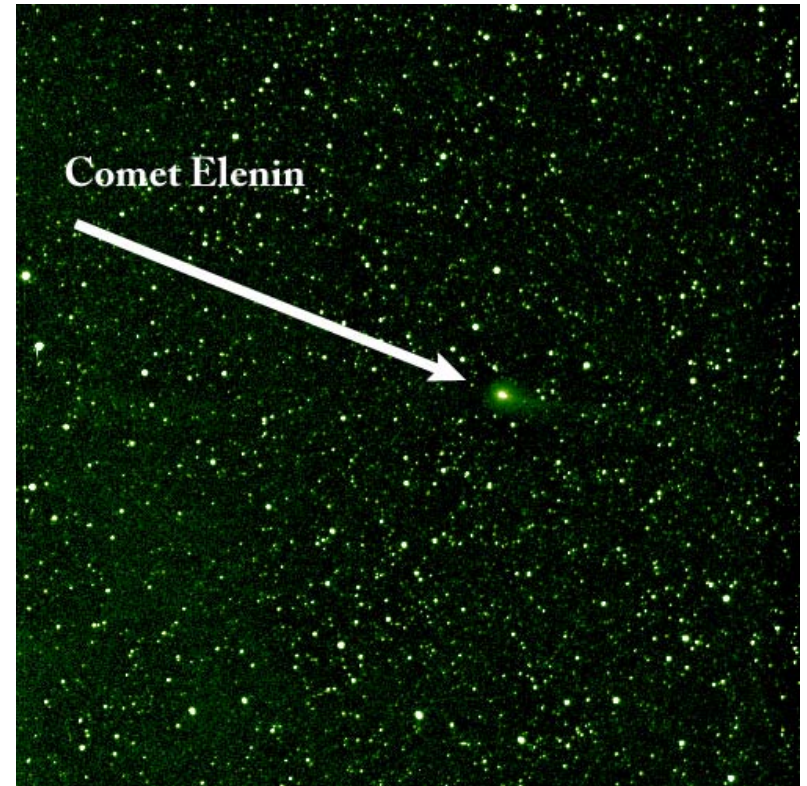
STEREO Science Center Status Report

William Thompson
NASA Goddard Space Flight Center

STEREO SWG #23
29 March 2012
(via telecon)

Recent Science Events

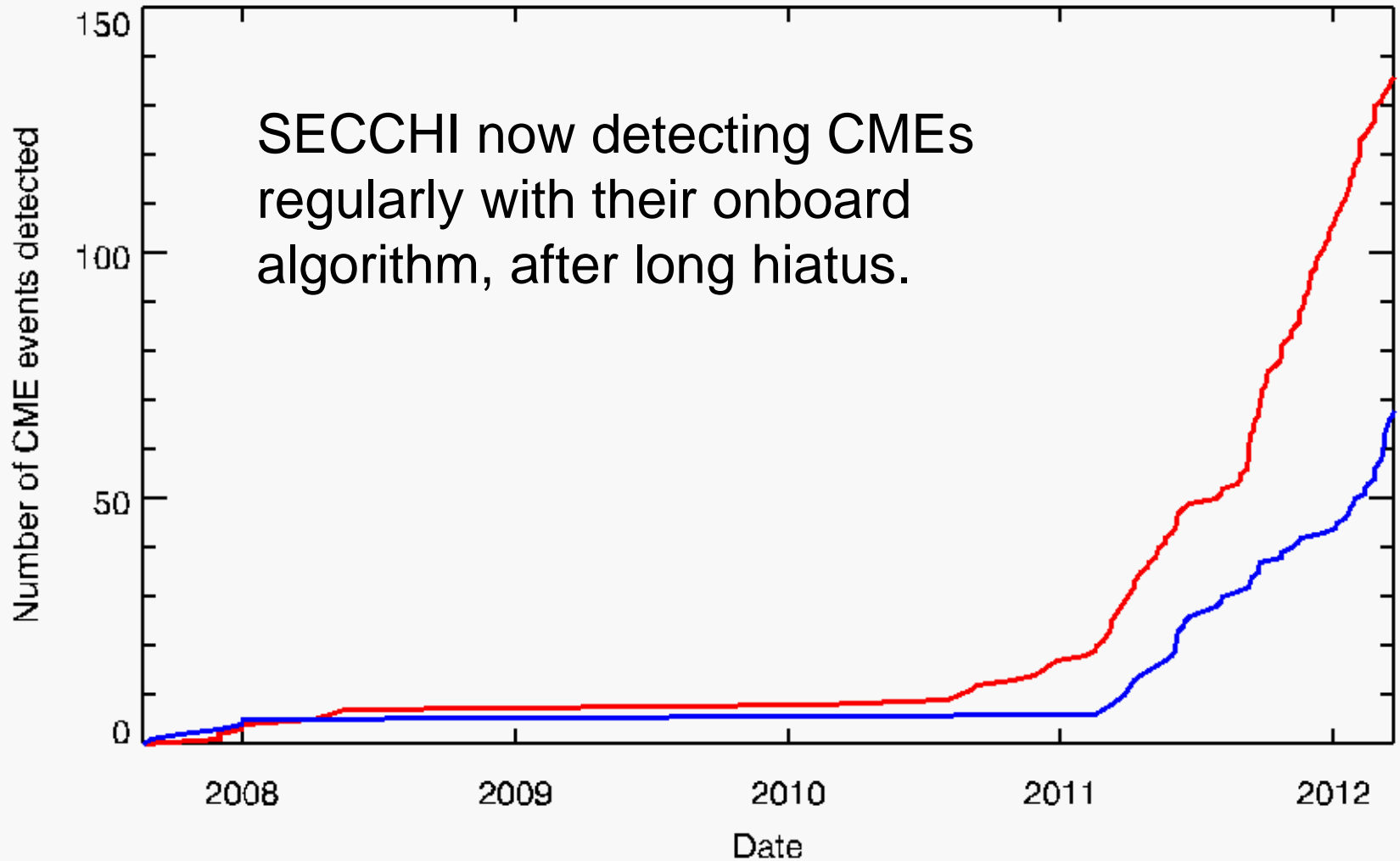
Comet Elenin passed about 0.05 AU from the Behind spacecraft on Aug 1, 2011. Special 135° rolls were made Aug 1-12 to observe the comet.



Comet Lovejoy passed by the Sun on Dec 15-16, 2011, and was observed in the EUV by STEREO, SDO, and other missions. It was the first sungrazing comet seen to survive perihelion in the space age.

SECCHI CME Event Detection

SECCHI CME Event Detection



Upcoming Science Opportunities

- 2012
 - DAWN currently at Vesta, leaves July
 - **Total solar eclipse, November 13, Australia**
- 2013
 - **Ahead: Mercury transit, Dec 12**
- 2014
 - **Behind: Mercury transit, Apr 29**
 - MAVEN arrives at Mars, September
- 2015
 - DAWN arrives at Ceres
 - **STEREO goes behind Sun**
 - Ahead, Mar 17–Jul 14
 - Behind, Jan 20–Mar 28, Aug 25–Oct 19
- 2018
 - **Ahead: Mercury transit, Mar 5**

Telemetry Rates

- Both spacecraft are currently operating at **160 kbps** on 34 m stations, and **480 kbps** on 70 m stations.
- Rates are **240 kbps** and **720 kbps** respectively if elevation above 25° for entire pass.
- Switch to **120 kbps** on Behind: **Nov 4, 2012**, Ahead: **May 2013**
- Lower telemetry rates are no longer anticipated.
- After 2015 the telemetry rates start increasing again

Science Plan for 120 kbps

- The following changes are in the STEREO Science Plan for the switch to 120 kbps:
 - IMPACT daily data volume drops from 239 Mbits to 203 Mbits:
 - Reduce burst data to one 20-minute burst/day
 - Eliminate “burst criteria” product from telemetry
 - PLASTIC daily data volume drops from 213 Mbits to 180 Mbits:
 - Reduce “matrix” time resolution to 20 minutes
 - SWAVES daily data volume drops from 163 Mbits to 145 Mbits:
 - Reduce time resolution to one full spectrum per minute
 - SECCHI daily data volume drops from 2763 Mbits to 1970 Mbits

Beacon Status

- Receiving telemetry regularly from the following stations:
 - Koganei, Japan
 - Toulouse, France
 - Kiel-Ronne, Germany
 - Bochum, Germany
- Still no station in U.S.—gap in coverage.
- Large gaps also seen when Koganei unavailable—no other stations in Asia.
- Station in Beijing, China attempting to capture beacon telemetry, but not yet successful for unknown reason.
- Successful test of Turbo mode for beacon telemetry at Bochum on 13 October 2011. NOAA gathering information needed to deploy software to all stations. Plan to implement when convolutional encoding no longer effective.

Archive Status – IMPACT

- Level-1
 - CDF-format: LET, MAG, SEPT, SIT, STE, SWEA
 - HET data only available as ASCII (Level-2)
 - SWEA MOM and PAD files in (gzipped) ASCII format.
- Level-2
 - No change in Level-2 status
 - CDF product not yet defined
 - Some ASCII products available on instrument web sites
- Level-3
 - Event lists (ICME, SIR, Shocks) in XLS and PDF

Archive Status – PLASTIC

- Level-1
 - Available as CDF
- Level-2
 - Alpha particles: CDF and ASCII
 - 10 min: through A: **2010**, B: CDF: **2007**, ASCII: **June 2010**
 - 1 hour: through A: 2010, **B: 2009**
 - Iron abundances and charge states: CDF, ASCII, PNG
 - **No abundances for Behind**
 - Protons: CDF and ASCII
- Level-3
 - He⁺ and Suprathermals available as ASCII

Archive Status – SECCHI/SWAVES

- **SECCHI**

- Primary data product archived as Level-1
 - Higher level products generated via *SolarSoft*
- Instrumental background data also archived for coronagraphs and HIs
- Level-2 files archived for HI-1 and HI-2 with UK-derived backgrounds subtracted

- **SWAVES**

- Level-1 data archived as IDL save files, ASCII
- Plots in PDF, PNG, PS formats
- Level-3 event lists available on instrument website

EPO Status

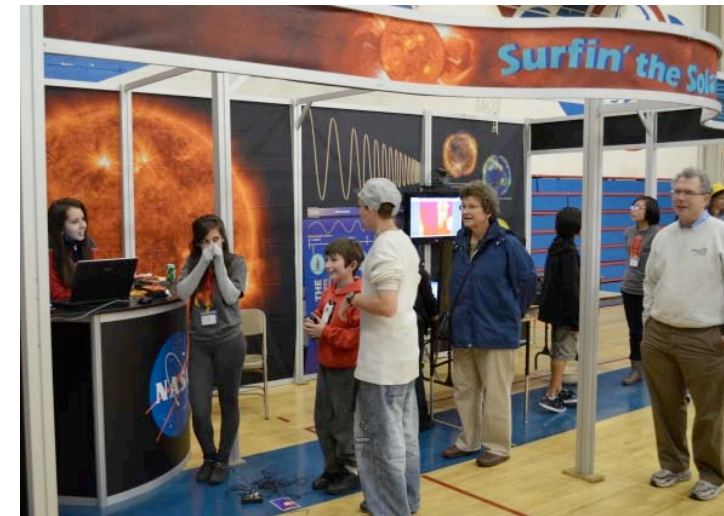
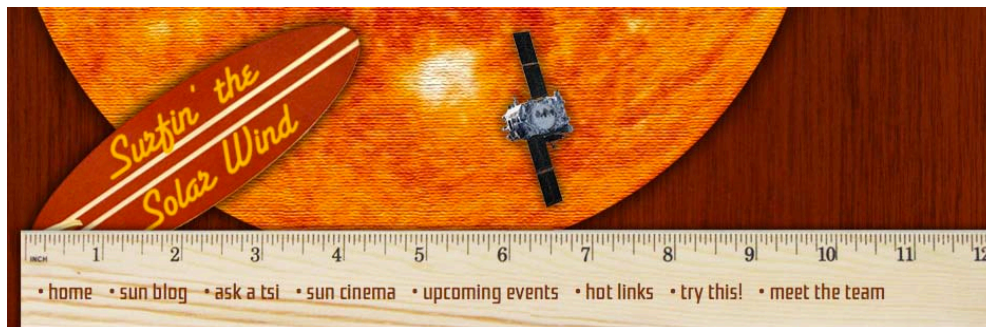
STEREO E/PO continues via the work of the SSC and STEREO instrument team members
STEREO one of several participants, contributors to E/PO efforts

Surfin' the Solar Wind

Surfin' the Solar Wind - Teen Outreach (IMPACT, UC Berkeley)

<http://www.teensolarinvestigators.org/>

- After school program for Teen Solar Investigators in SF Bay area
- Web site
- Public Outreach
- Kyle Fricke new IMPACT E/PO Lead



Star Party @ San Leandro High
Igor Ruderman, Surfin' the Solar Wind (UCB/SSL)

Museums and Science Centers

•Partnerships Continue

- McAuliffe-Shepard Discovery Center, including the yearly *AeroSpaceFest* (PLASTIC UNH)
- STEREO featured in Hamburg Planetarium Shows (SECCHI), including a new show about the aurora

•Providing Video Materials for Science Centers

- Museum Alliance –high quality movies, including multi instrument movies of events (SECCHI NRL, JPL)
- Pick of the Week (SSC, GSFC)
 - American Museum of Natural History Network (35 museums)
 - STScI's View Space (>350 kiosks)
- Science on a Sphere STEREO+SDO product & now JPL group has Magic Planet product.

Hard Copy Products

STEREO Sees the Entire Sun litho, STEREO 3D posters, 2D/3D lithos, 3D glasses, and 3D and new motion lenticular cards -- *still available.*

Supporting Astro. Soc. of the Pacific's Night Sky Network (>100 boxes of materials sent out in 2011)



Web

Many videos made available at the STEREO SSC's outreach site and YouTube Sites:

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

<http://www.youtube.com/user/stereomission01>

The Sun Today

<http://www.thesuntoday.org>

- Website, Blog
- Narrated YouTube Videos (viewership sometimes high as 10K, 100K, even 800K)
- Facebook (10K fans), Twitter

Uses data from STEREO and other Heliophysics spacecraft, including video made by public with Helioviewer: <http://helioviewer.org>

Audience includes general public, students & teachers, mass media

Special feature for STEREO 5th anniversary
Alex Young (SSC)

The screenshot displays the homepage of 'The Sun Today' website. The header features the site's name 'The Sun Today' with the subtitle 'Solar Facts & Space Weather' and the author 'C. Alex Young, Ph.D.'. A search bar is located in the top right corner. Below the header is a navigation menu with links for Home, Glossary, Mission Hub, About, Team Bios, Ask a Solar Physicist, and The Sun Now. A secondary menu includes Current Observations, Historical Sun, and Sun 101. The main content area features a 'Happy 5th STEREO!' announcement dated October 26, 2011, by calaxyoung, with a 'Leave a Comment' link. Below the announcement are social media sharing options for Twitter (6), Facebook (350), and LinkedIn (1). A video player is embedded, showing a solar filament eruption with a play button overlay. The video caption reads: 'A spectacular filament eruption from June 7, 2011 captured by the STEREO Ahead spacecraft with EUVI 304, Cor1 and Cor2.' Below the video is a paragraph celebrating the 5th anniversary of the STEREO mission. On the right side, there is a social media widget with icons for Twitter, Facebook, YouTube, LinkedIn, and RSS. Below that is a 'The Sun Today News & Special Alerts' sign-up form with fields for Name and Email, and a 'Sign Up »' button. A 'Recent Posts' section lists several articles with star icons. At the bottom right, there is a promotion for 'FREE Solar Wallpapers for our Facebook Fans!' with a link to 'www.facebook.com/thesuntoday' and a row of wallpaper thumbnails.

Other Outreach activities

- **Women in Science and Technology (WIST) Forum** for middle and high school girls in New Hampshire (PLASTIC)
- New Hampshire Space Grant **Middle School Teacher Workshop** (PLASTIC)
- **Endeavor Program:** Teams of selected Pennsylvania middle school students focus on a solar mission, develop an outreach product, and present their idea via DLN. (*SSC Now in its 12th year*)
- Public presentations in the US, France, Germany,...



Kaufpark Exhibit, Sept. 14-26, 2009



NH Space Grant Middle School Teacher Workshop