

STEREO Science Center

SWG – May 2005

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Both the STEREO and SSC websites are up and running

The image displays two overlapping screenshots of web browsers. The left browser window, titled "STEREO - Home Page - Netscape", shows the main STEREO website. The address bar contains "http://stereo.gsfc.nasa.gov/". The page features a large graphic of the Sun and the STEREO spacecraft, with the text "3-D VIEW OF THE SUN AND HELIOSPHERE". A navigation menu includes "HOME", "CONTACT", and "SITE". The main content area says "Welcome to the STEREO website!" and describes the mission's objective: "STEREO will use stereoscopic (3-D) vision to construct a global picture of the Sun and its influences." A sidebar on the left lists sections: MISSION, IN THE NEWS, SCIENCE, and RESOURCES. The bottom of the page includes a "Last Revised" date of Friday, 27-Aug-2004 15:05:26 EDT and contact information for Michael L. Kaiser.

The right browser window, titled "STEREO - Meetings - Netscape", shows the "STEREO SCIENCE CENTER" website. The address bar contains "http://stereo-ssc.nascom.nasa.gov/meetings.shtml". The page features a graphic of the Sun and the SSC logo. A navigation menu includes "HOME", "CONTACT", and "SITE MAP". The main content area is titled "Upcoming meetings" and lists several events, including "Science Working Group meetings" and "STEREO Conferences and Workshops". A sidebar on the left lists sections: HOME, IN THE NEWS, PLANNING, ARCHIVE, ANALYSIS, and GENERAL. The bottom of the page includes a "Last Revised" date of Tuesday, 07-Sep-2004 10:59:46 EDT and contact information for Michael L. Kaiser.

Current status of STEREO website

- Site Map
- Home page
- Contact
 - Team member list
- Mission descriptions
 - Mission
 - Concept
 - Design
 - Why STEREO?
 - Spacecraft
 - Launch
 - Instruments
 - IMPACT institutions
 - PLASTIC institutions
 - SECCHI institutions
 - SWAVES institutions
 - Where is STEREO?
 - STEREO orbit simulations

- In the News
 - What's New?
 - Current status
 - Newsroom
- Science
 - Space weather
- Resources
 - Latest images
 - Gallery
 - Image gallery
 - Learning center
 - Frequently asked questions
 - Products
 - Links
- Privacy statement
- Link to STEREO Science Center

Done
In between
Not done

Current status of SSC website

- Site Map
- Home page
- Contact
 - Team member list
- In the News
 - What's New?
 - Current Status
- Planning
 - Where is STEREO?
 - STEREO orbit simulations
 - Current plans
 - Resources
- Archive
 - Data
 - Ancillary
 - Telemetry
- Analysis
 - Software
 - Models
- General
 - Meetings
 - STEREO Workshop #1
 - Publications
 - Links
- Mockups of realtime STEREO pages
 - Beacon mockup #1
 - Beacon mockup #2
 - Latest images mockup
 - Where is STEREO? mockup
 - Heliocentric orbit movie
 - Phasing orbit movie
- Privacy statement
- Link to main STEREO website
- Intranet
 - Earlier SWG meetings
 - Notes from software telecons

Web site has been moved from Linux development site to Mac OS-X production platform.

Software & Data Handling Telecons

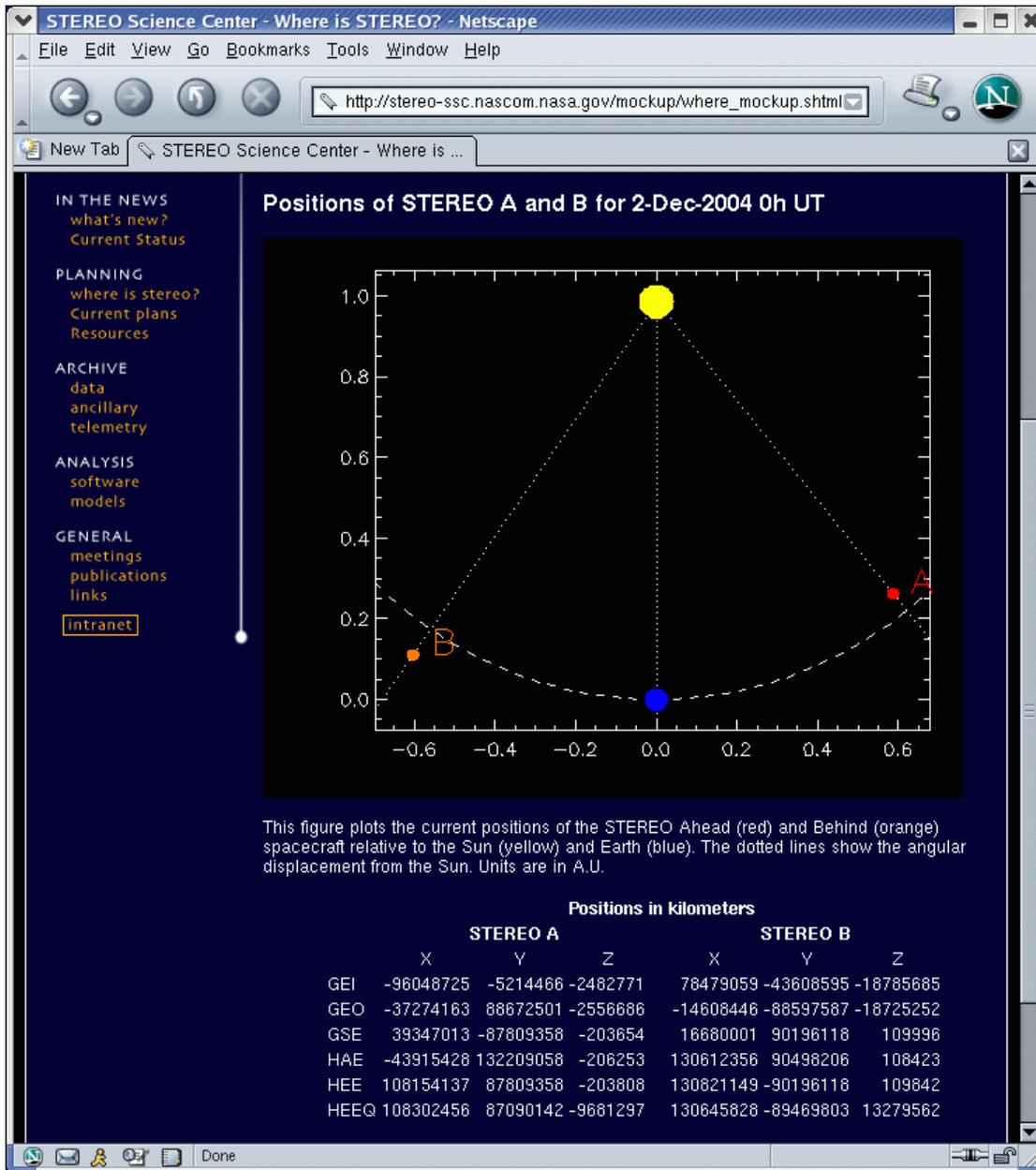
- Have started a series of monthly teleconference meetings to discuss software and data handling issues.
- So far have held four telecons:
 - **21-Jan-2005**: Mission Simulations
 - Decided to test Beacon processing in Sim #3 (October)
 - **14-Feb-2005**: Coordinates
 - **18-Mar-2005**: Beacon processing
 - **20-Apr-2005**: Catalogs
- Some results of these telecons are discussed in the following slides.

Coordinate Systems

- Software telecon on Feb 14th established coordinate standards:
 - Primary coordinate system for positioning will be *Heliocentric Inertial (HCI)*:
 - **Z**=Solar rotational axis
 - **X**=Solar ascending node on ecliptic of J2000
 - Primary coordinate system for orientation will be *Heliocentric Radial-Tangential-Normal (HGRTN)*:
 - **X**=Sun center to spacecraft
 - **Y**=Cross product of solar rotational axis and **X**
 - **Z**=**X**×**Y**, and is projection of solar rotational axis
 - Primary coordinate system for SECCHI images will be *Helioprojective-Cartesian (HPC)*:
 - Standard for imaging data (e.g. SOHO)
 - Directly related to RTN: $\mathbf{X}_{\text{HPC}}=\mathbf{Y}_{\text{RTN}}$, $\mathbf{Y}_{\text{HPC}}=\mathbf{Z}_{\text{RTN}}$, $\mathbf{Z}_{\text{HPC}}=\mathbf{X}_{\text{RTN}}$

Coordinate Systems (cont.)

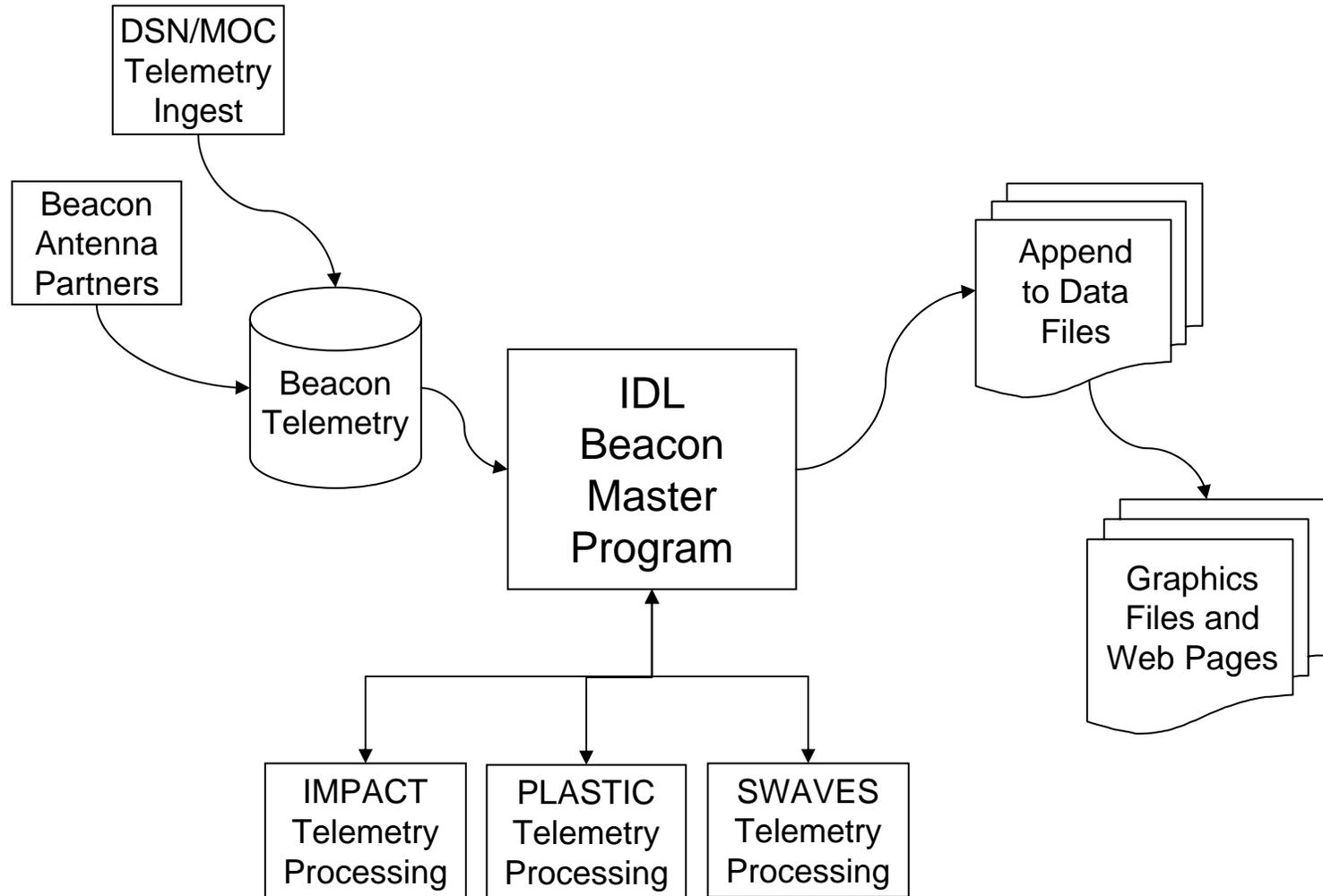
- SSC working on software to simplify coordinate transformations.
- Using new Dynamic Frames capability introduced in SPICE version N0058.
- The following coordinate systems are currently supported:
 - **GEI**: *Geocentric Equatorial Inertial*
 - **GEO**: *Geographic*
 - **GSE**: *Geocentric Solar Ecliptic*
 - **HCI**: *Heliocentric Inertial*
 - **HAE**: *Heliocentric Aries Ecliptic*
 - **HEE**: *Heliocentric Earth Ecliptic*
 - **HEEQ**: *Heliocentric Earth Equatorial (**Stonyhurst Heliographic**)*
 - **Carrington Heliographic**
 - **(HG)RTN**: *(Heliocentric) Radial-Tangential-Normal* for STEREO-A and B
- Coordinate conversions can be performed in FORTRAN, C, or IDL.
- Still need to incorporate STEREO Attitude History files.



Where is STEREO? Mockup

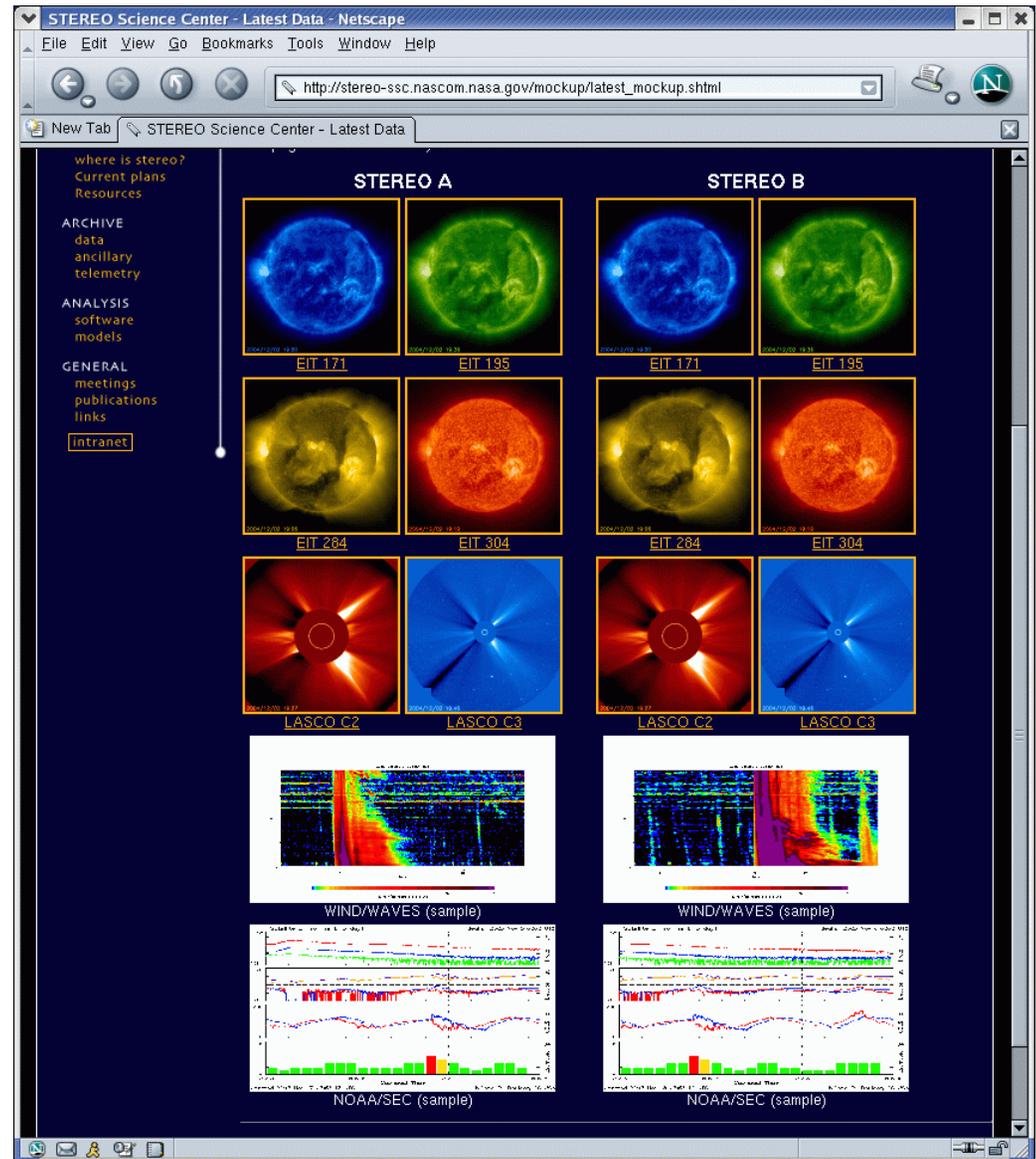
- Automatically generated using SPICE software.
- Data calculated for today's date in 2007—will reset on January 1st
- Updated daily via cron job
- Graphical display of STEREO A, B, Sun, and Earth on ecliptic plane
- Table shows x, y, z positions of STEREO A and B in several standard coordinate systems.
- *What other information should appear on this page?*

Beacon Telemetry Processing Flow (except SECCHI)



Latest Images Mockup

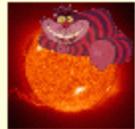
- Platform for testing ideas for how to display the latest STEREO images
- Automatically generated every hour
- Currently, the only images which are updated are EIT and LASCO images from SOHO, plus WIND/WAVES
- Uses same images which are served from the SOHO home page
- Same images used for STEREO A and B



Event lists & VSO — Search



VSO Time / Catalog Search Form Version 1.0



Start Date/Time: 2005 Jan 12 / 22 : 00

End Date/Time: 2005 Jan 13 / 01 : 59

or

Whole catalog

Start with a search menu to narrow down time range and selected properties.

Catalogs

SOHO/LASCO CME Catalog

CME Type

All

Halo

Partial Halo

Halo+Partial Halo

Non-Halo

Visibility

C2 or C3

C2 and C3

At least C2

GOES X-Ray Catalog

Class

Match Type: =

All

Active Region

Enter Active Region #

Search

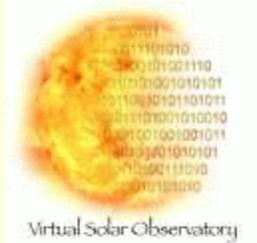
Clear

SOHO catalog shown as representative test case.

Notes

- SOHO/LASCO CME Catalog: This CME Catalog has been compiled by [Seiji Yashiro \(Homepage\)](#) and [Grzegorz Michalek](#) under the guidance of [Nat Gopalswamy](#). Comments or questions about this catalog? Please contact [the authors](#).
- GOES X-Ray Catalog: This catalog is from the [National Geophysical Data Center](#).

Event lists & VSO — Browse



VSO Catalog Search Results

SOHO/LASCO CME Catalog

Search Params not available

row Total: 4

Search VSO Help:

Go

Summary Terms [\[show\]](#)

Query Menu [\[hide\]](#)

Search Status [\[show\]](#)

Rows Returned [\[show\]](#)

Add/Remove Columns [\[show\]](#)

CheckBox Tools

Select ...?

All Above this box

All Below this box

Just this box

Select All **Clear**

<< prev - 1 - next >>

[Sort Only](#) | [Rearrange only](#) | [Sort & Rearrange](#) ?

Views: [All](#) ?

<input type="checkbox"/> First Obs. [UT]	<input type="checkbox"/> Calculated Onset [UT]	<input type="checkbox"/> Central PA [deg]	<input type="checkbox"/> Angular Width [deg]	<input type="checkbox"/> Linear Fit Speed [km/s]	<input type="checkbox"/> 2nd Order Fit Speed [km/s]	<input type="checkbox"/> Acceleration [m/s^2]	<input type="checkbox"/> Measured PA [deg]	<input type="checkbox"/> Halo CME?	<input type="checkbox"/> # of Obs.	<input type="checkbox"/> In C2?	<input type="checkbox"/> In C3?	<input type="checkbox"/> Comments
<input type="checkbox"/> 2002-01-04 09:30:05	2002-01-04 08:58:26	Halo	360	896	1066	-26.1	45	halo cme	10	true	true	
<input type="checkbox"/> 2002-01-08 17:54:05	2002-01-08 17:41:34	Halo	360	1794	1405	81.4	89	halo cme	5	true	true	
<input type="checkbox"/> 2002-01-14 05:35:07	2002-01-14 05:26:06	Halo	360	1492	1230	52.3	246	halo cme	19	true	true	
<input type="checkbox"/> 2002-01-27 12:30:05	2002-01-27 11:58:27	Halo	360	1136	1259	-19.2	312	halo cme	8	true	true	

End up with browse tool. Eventually, this will include graphics for each event.

Export to Text

Search Against Catalog

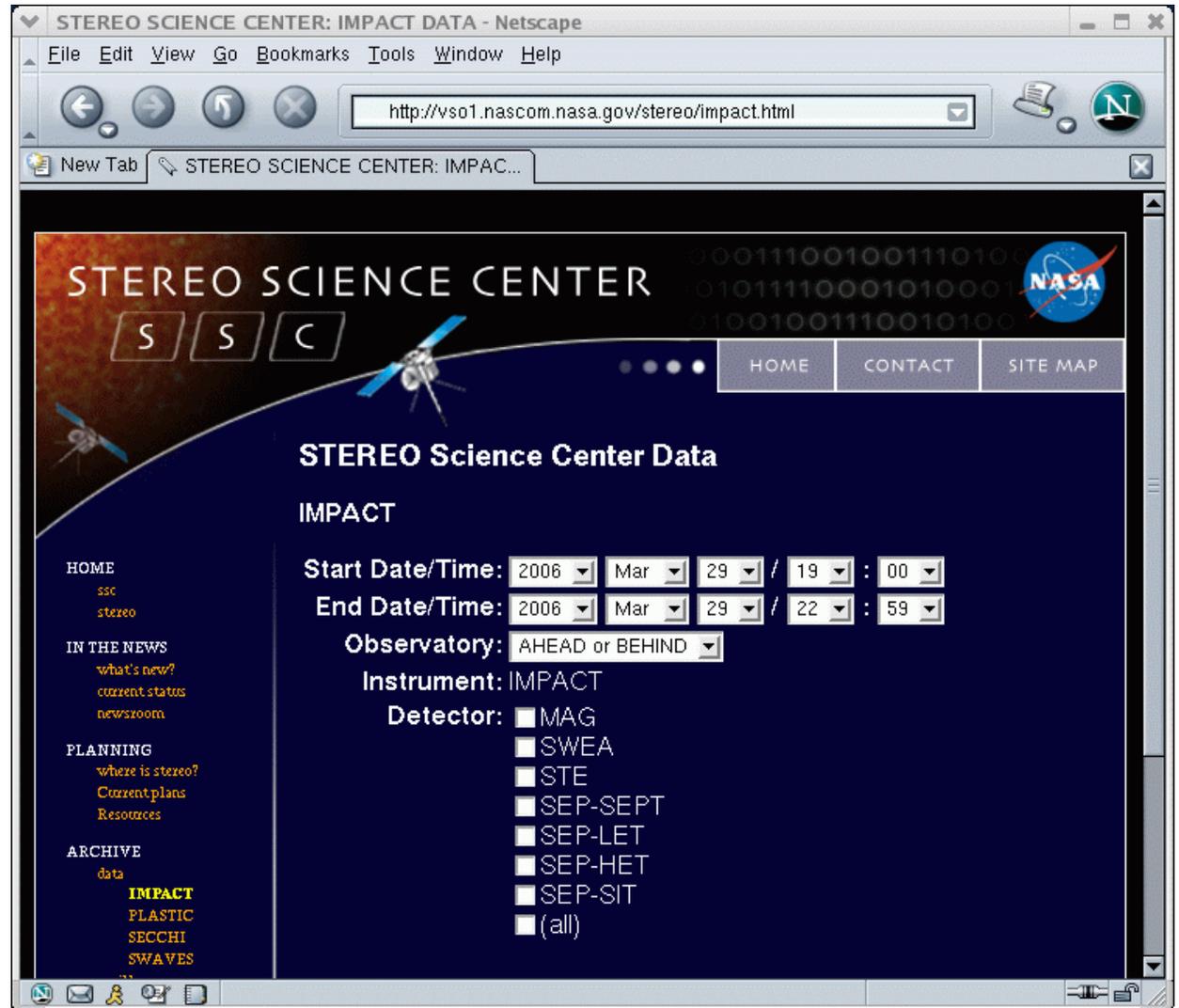
Request Data

Button goes to search tool for data associated with event.

2:41 PM MST

Data Catalog Searches

- **Have started the process of defining the search forms for the data themselves.**
- **The basic search parameters are date, observatory, sub-instrument, and a few others.**
- **More detailed searches will be added in a second phase.**



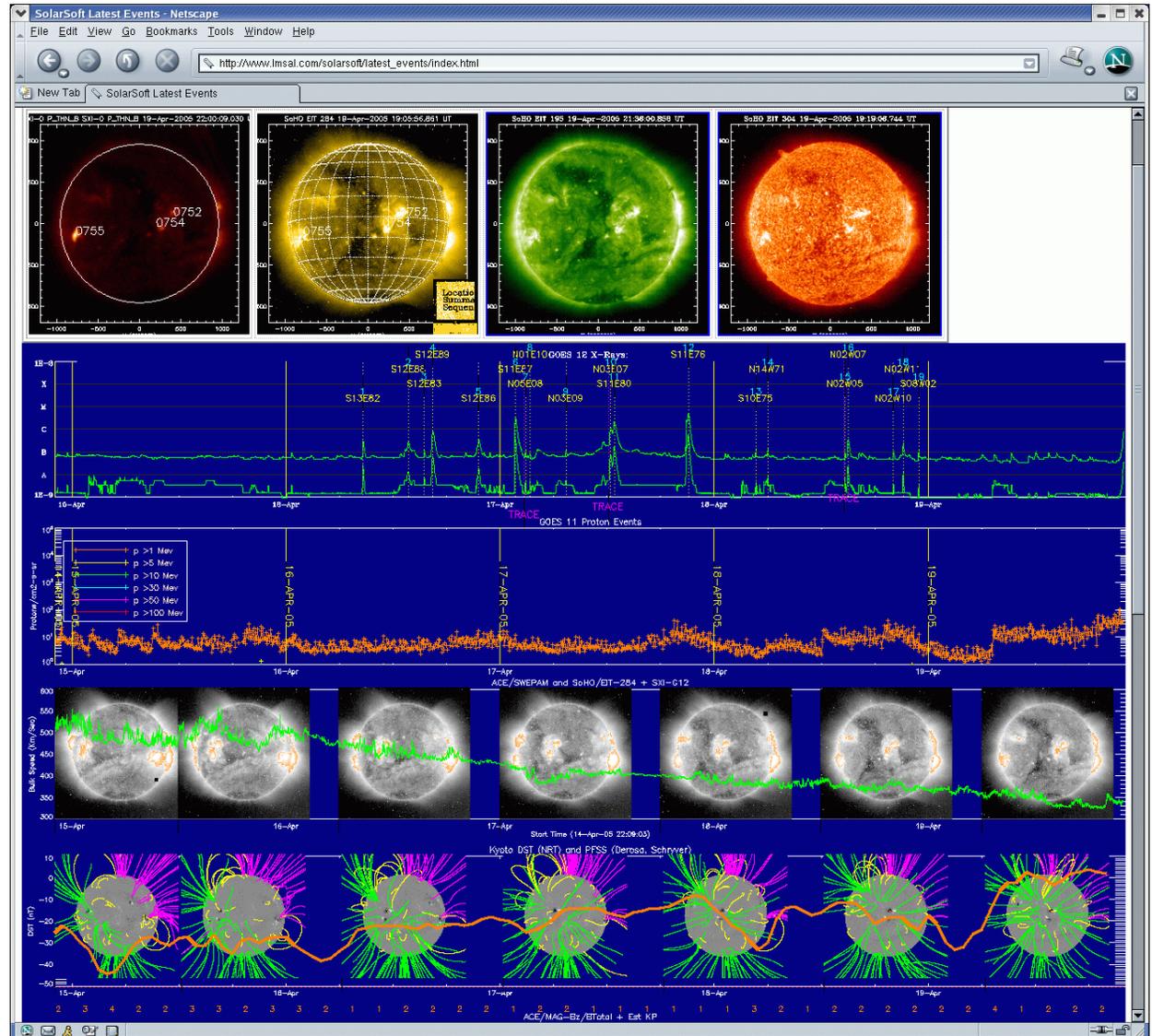
Solarsoft STEREO

```
$SSW/stereo---gen---idl
|-impact
|-plastic
|-secchi---data
|   \-idl---cor1
|       |-cor2
|       |-euvi
|       |-gen
|       |-hi
|       |-pipeline
|       \-util
|-ssc---data---spice_demo
|   |-idl---spice
|   |   \-telemetry
|   \-setup
\swaves
```

- Some software has been uploaded to the SECCHI and SSC software trees.
- These software and supporting data files are available through the website, or via the SolarSoft installation script.
- The SSC tree includes demo routines for SPICE and telemetry processing.
- *Do any of the other teams have software ready to be uploaded to SolarSoft?*

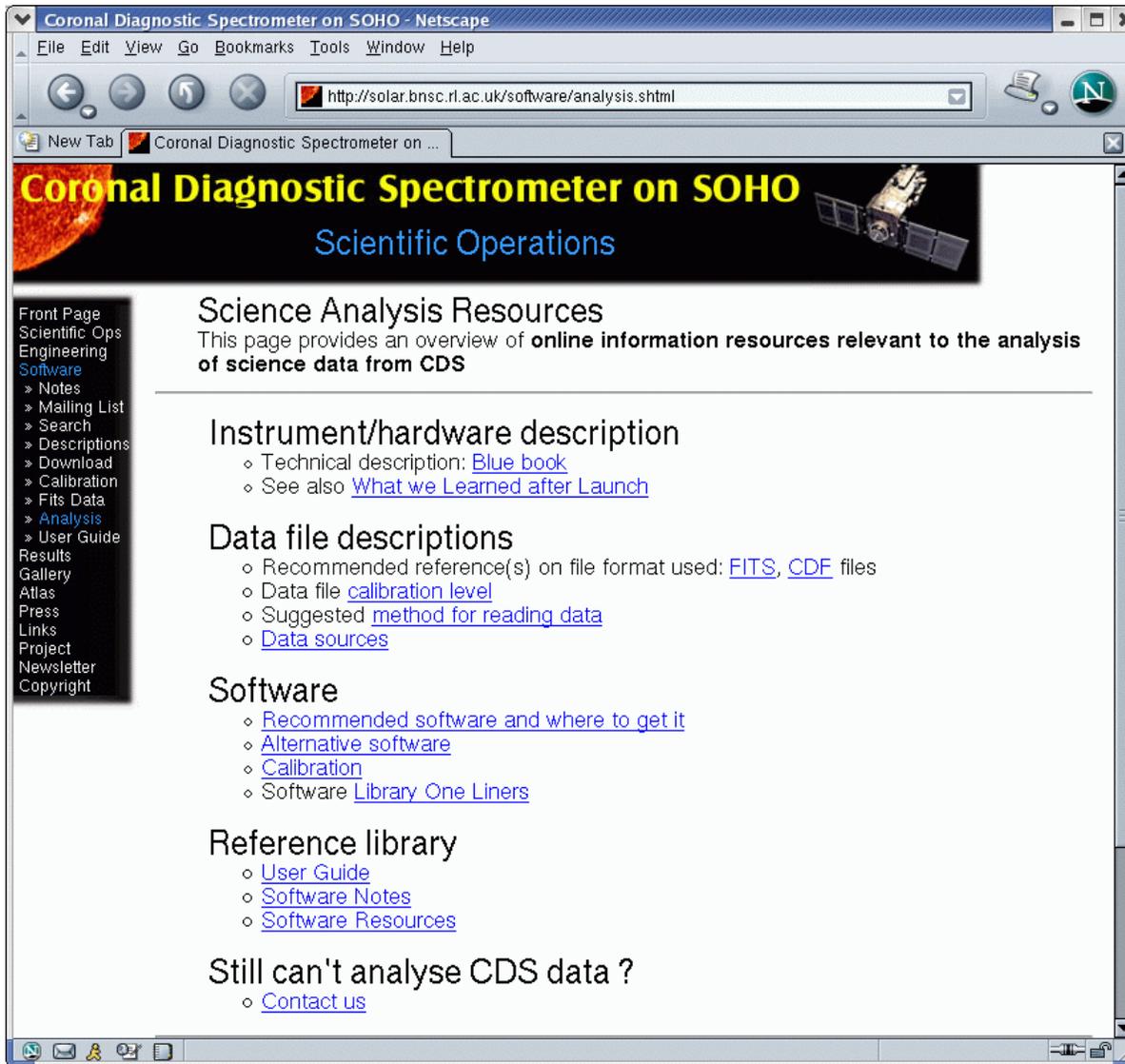
SolarSoft Example: Latest Events

- Automatically updated page shows latest solar events.
- Shows power of SolarSoft library.
- Planning on using a version of this for displaying recent STEREO data on the web.



http://www.lmsal.com/solarsoft/latest_events/

Instrument Resources Pages



- A useful concept is to have resource pages for each instrument.
- Similar format for each instrument.
- Provides information about file formats, calibration, analysis software, and contact information.
- We ask that each team provide and maintain such a page.
- See the SOHO pages at the URL below for examples.

<http://soho.nascom.nasa.gov/mission/instruments.html>

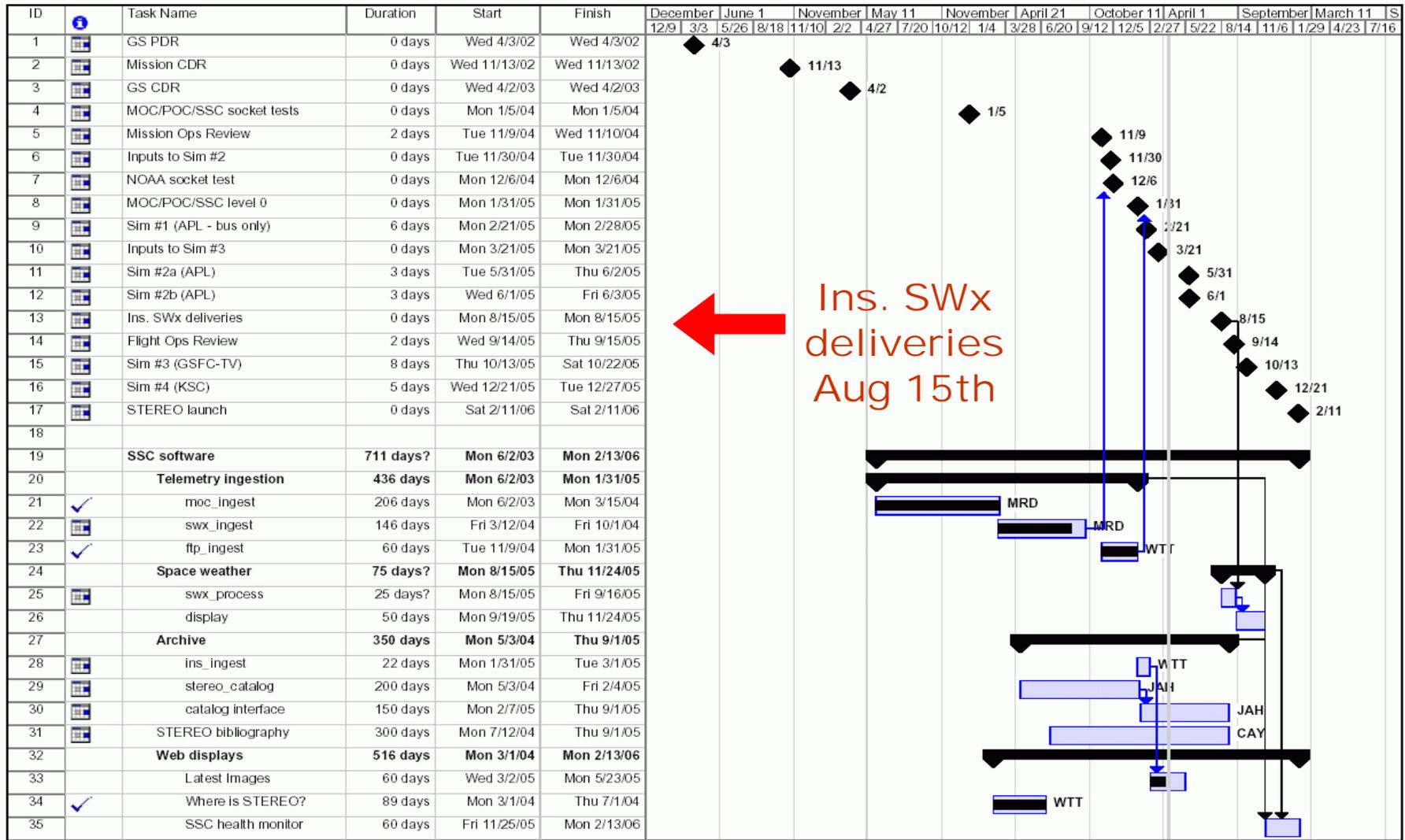
Software tasks

- **moc_ingest**: Ingest telemetry from MOC
 - Substantially completed, successful tests
- **swx_ingest**: Ingest SWx telemetry from antenna partners
 - Draft ICD with NOAA
 - Software partially completed—successful test
- **ftp_ingest**: Copy files from MOC
 - Using rsync
- **swx_process**: Process space weather data
 - Requires software from instrument teams
- **ins_ingest**: Copy files from instrument teams
 - Prefer to use rsync (push or pull? – prefer pull)

Software tasks (cont.)

- **Stereo_catalog**: Baseline is MySQL
 - Need to define what the catalog will contain
- **stereo_bibliography**: To be defined
- **Web displays**
 - Space Weather Beacon
 - Latest Images and Plots
 - Where is STEREO? (working prototype)
 - Catalog interface
 - Planning timeline
 - SSC health monitor

SSC Development Schedule



← Ins. SWx deliveries Aug 15th

Project: SSC
Date: Tue 4/12/05

Task		Milestone		External Tasks	
Split		Summary		External Milestone	
Progress		Project Summary		Deadline	

Where do we go from here?

- Need to start working on the data browser/ catalog interface
 - Depends in part on the catalog definition
 - What software will the instrument teams provide for producing daily browse plots?
 - Event lists will be a major component
- Need *SWx* software from instrument teams by Aug 15th.
 - SECCHI needs to propose a processing scheme for their beacon data.
- Will be supporting upcoming Mission Sims #2 and #3.
- Continue to work on beacon telemetry ingest.
 - Need to do more testing.
- Continue to work out interfaces with VSO, VSPO, VHO, etc.
 - STEREO will be integrated directly into VSO
 - Will take advantage of interfaces between VSO and other virtual observatories.
- Incorporate SolarSoft “*Latest Events*” page.