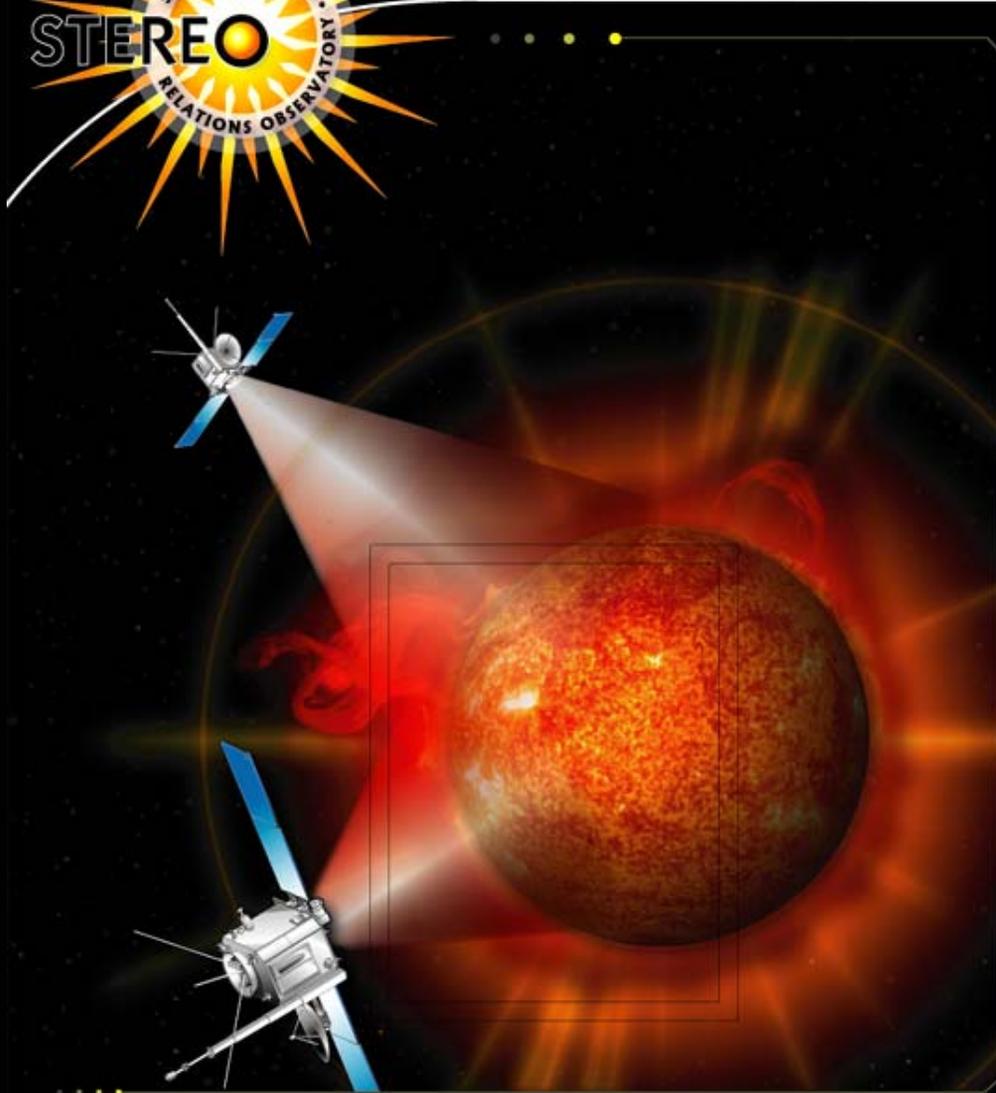


THE SUN LIKE IT'S NEVER
BEEN SEEN BEFORE!
..IN 3D..



The SolarSoft experience, and its application to STEREO

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What is SolarSoft?

- SolarSoft is a collection of software used for a wide variety of Solar Physics missions.
- Gives users and software developers a common environment for data analysis.
- Encourages data sharing, by allowing scientists to combine data from multiple sources in a single common environment.
- Provides an easy-to-use distribution system for software, and associated ancillary data files (e.g. calibration).
 - Users can keep their copy of SolarSoft up-to-date through nightly mirrors of changes.

<http://www.lmsal.com/solarsoft/>

Supported Missions and Observatories

Space Missions

- **CGRO/BATSE**: Compton Gamma Ray Observatory / Burst and Transient Source Experiment
- **GOES**
 - X-ray Flux Monitor
 - **SXI**: Solar X-ray Imager
- **HXRS**: Hard X-Ray Spectrometer
- **RHESSI**: Ramaty High Energy Solar Spectroscopic Imager
- **SMEI**: Solar Mass Ejection Imager
- **SMM**: Solar Maximum Mission
- **SOHO**: Solar and Heliospheric Observatory
- **Solar-B**
- **Spartan 201**
- **STEREO**: Solar Terrestrial Relations Observatory
- **TRACE**: Transition Region and Coronal Explorer
- **Yohkoh**

Optical

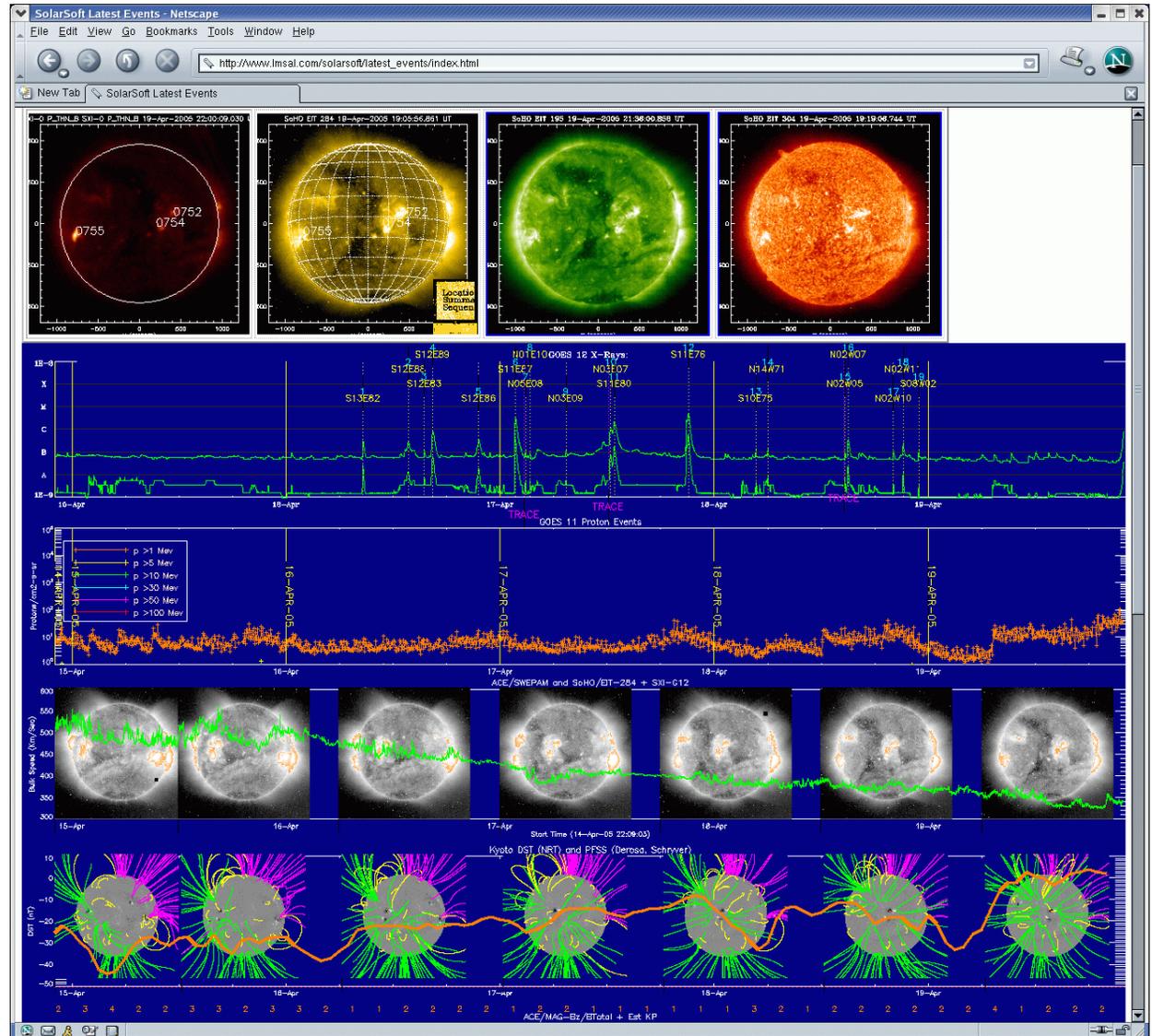
- **Mees Solar Observatory**, Haleakala, HI
- **NSO**: National Solar Observatory
- **SOON**: Solar Observing Optical Network
- **Swedish Solar Telescope**, La Palma, Spain

Radio

- **ETH Zurich**
- **NRH**: Nançay Radio Heliograph
- **NRO**: Nobeyama Radio Observatory
 - Radioheliograph
 - Radio Polarimeters
- **OVSA**: Owens Valley Solar Array

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/

SolarSoft Layout

- SolarSoft has a number of subdirectories, which split into three main categories:
 - General software (“gen”), shared by all
 - Mission-specific trees
 - Usually have instrument-specific trees under each mission top directory
 - Can also have mission “gen” tree, for software shared between the instruments
 - Optional packages (e.g. CHIANTI)
- Users can select which instruments should be loaded into IDL at run-time.
 - Start-up configuration done automatically

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
```

- The SolarSoft tree for STEREO has already been started.
- All the instrument teams have committed to distributing their software through SolarSoft
- Some software has been uploaded to the SECCHI and SSC software trees.
- Software has also been loaded in the STEREO “gen” tree, mainly for telemetry, and orbit and attitude files.

SolarSoft experience

- The big advantage of SolarSoft is that there is a vast amount of software already written to solve many common problems
 - The downside is that it can sometimes be difficult to find that software
- Software written for SOHO has been reused for STEREO
 - E.g. time-handling software
- SolarSoft is best described as a “beta-test” system, where problems are found by the user community, and solved by the core teams.
 - No official releases, continuously being updated
 - Most bug fixes done very quickly

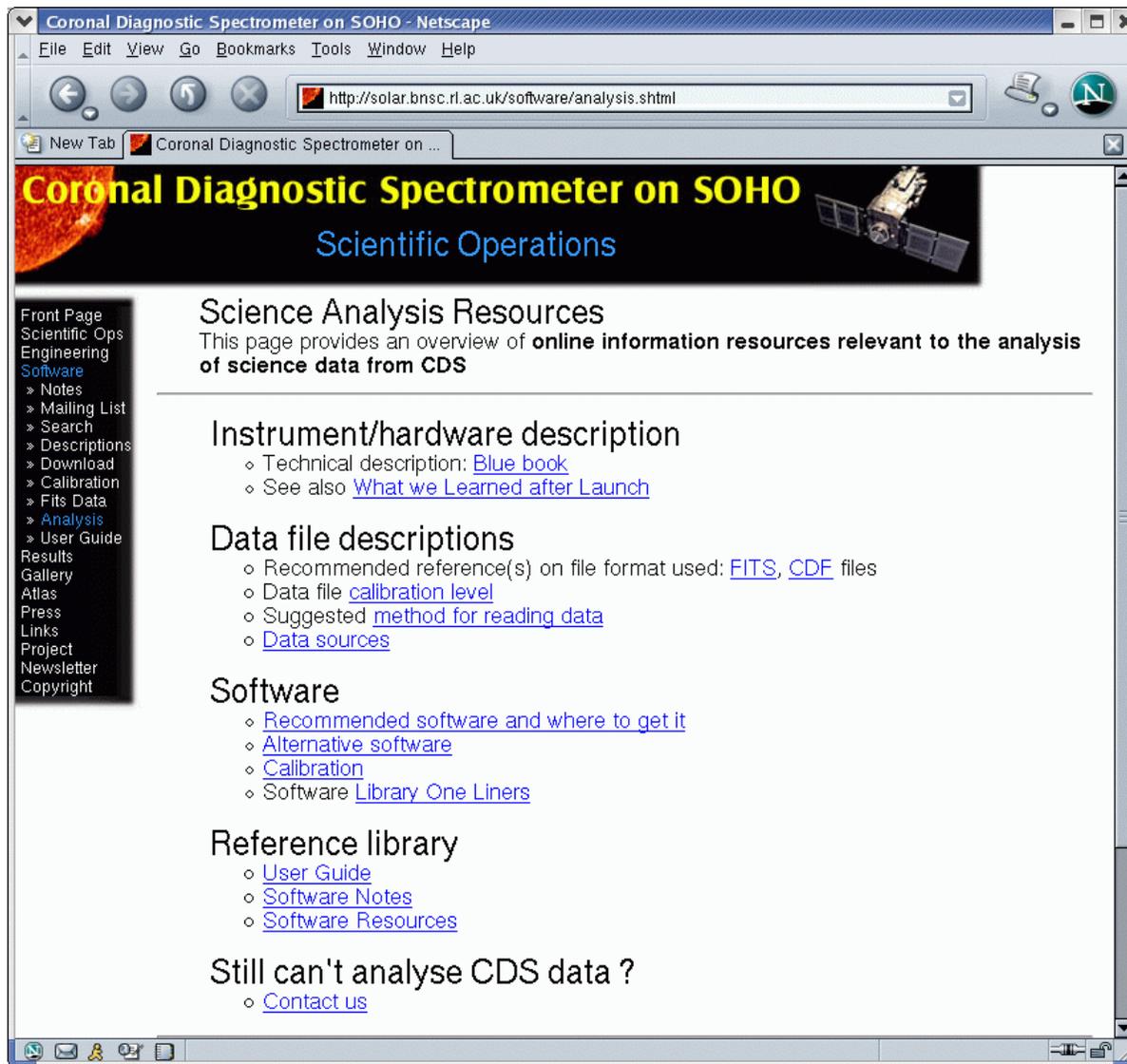
SOHO/CDS use of SolarSoft

- The Coronal Diagnostic Spectrometer aboard SOHO has taken a “snapshot” approach towards SolarSoft:
 - Analysis is done with the standard SolarSoft tree. Problems appear here first.
 - A separate copy of SolarSoft is used for operations.
 - The operations copy is refreshed only at designated times
 - A time-stamped (gzipped) tar file is made of the tree before refreshing. If any problems are found, the previous version of the operations tree can be recovered.
 - The operations tree also contains directories not found in SolarSoft
- Thus, the analysis and operations trees do not diverge from each other, but the operations tree is fully controlled.

Software Notes

- One of the concepts that CDS made use of was “software notes”.
 - A collection of numbered documents describing various aspects of the software
 - Served on the web
 - One of the software notes is a user’s guide
 - Most of the other notes were written first
- Created a directory to hold STEREO-wide software notes within SolarSoft:
[\\$SSW/stereo/gen/documentation](#)
- Suggest that instruments include their own documentation subdirectories within the SolarSoft tree

Instrument Resources Pages

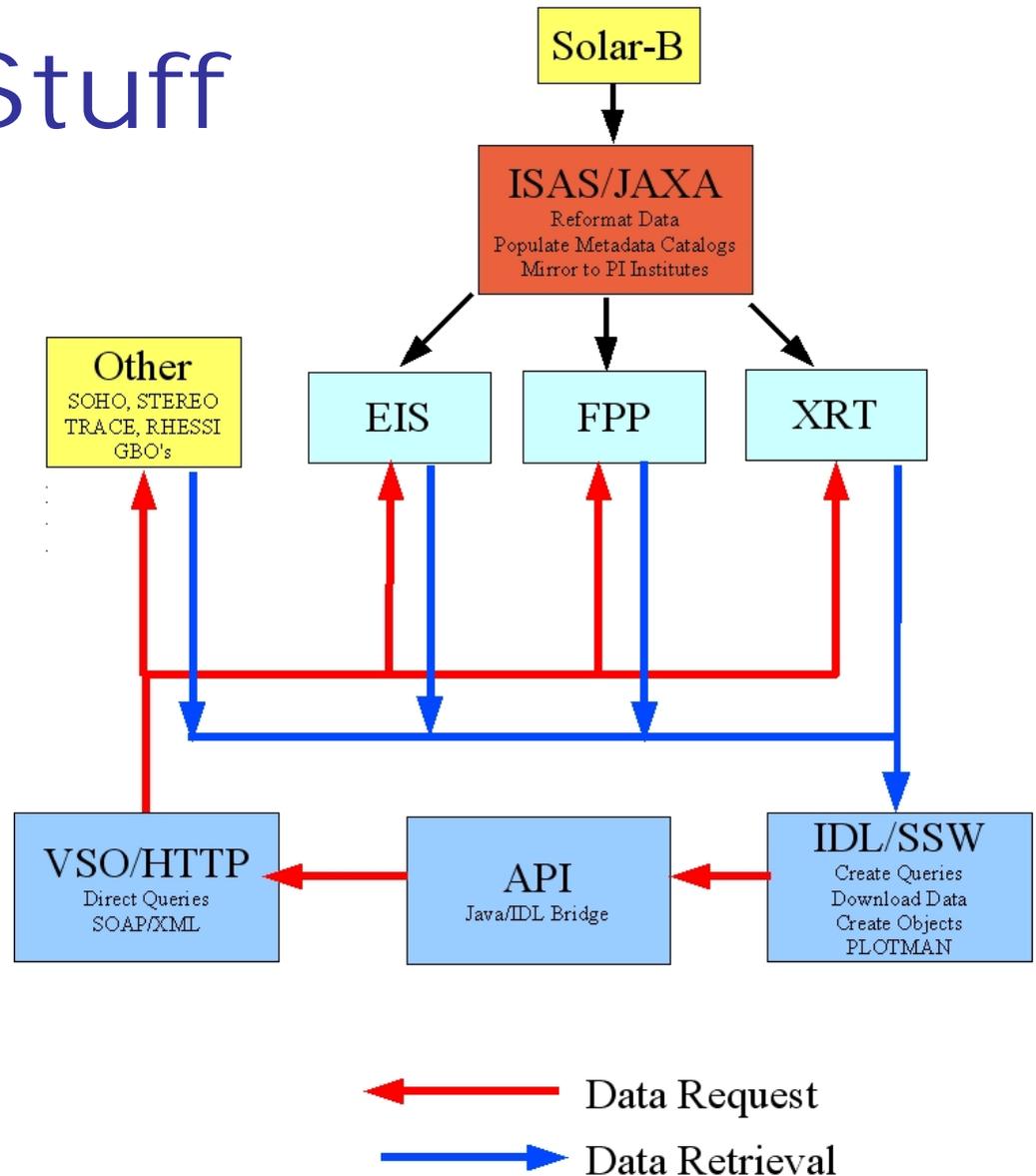


- A useful concept is to have resource pages for each instrument.
- Similar format for each instrument.
- Provides information about file formats, calibration, analysis software, and contact information.
- We ask that each STEREO team provide and maintain such a page.
- See the SOHO pages at the URL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

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

New Stuff

- Software using network sockets to read data files from the web
- Hooks into VSO using Java/IDL bridge
- Object-oriented software



How Solar-B, the VSO, & IDL work together

