



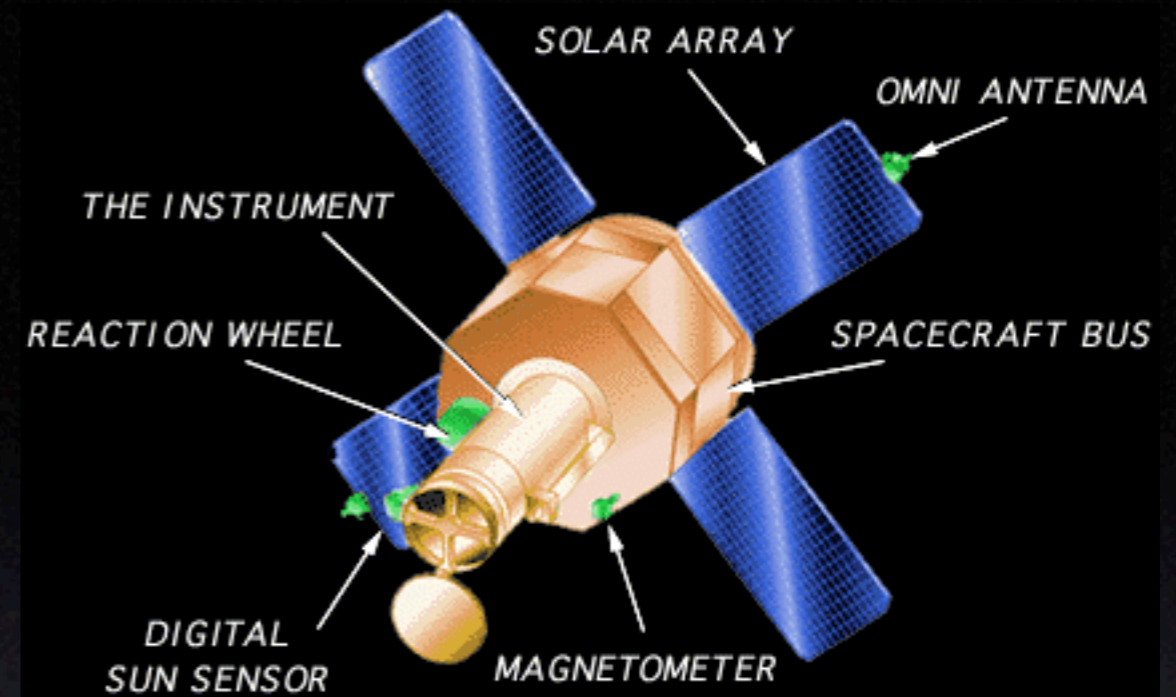
# TRACE Experience

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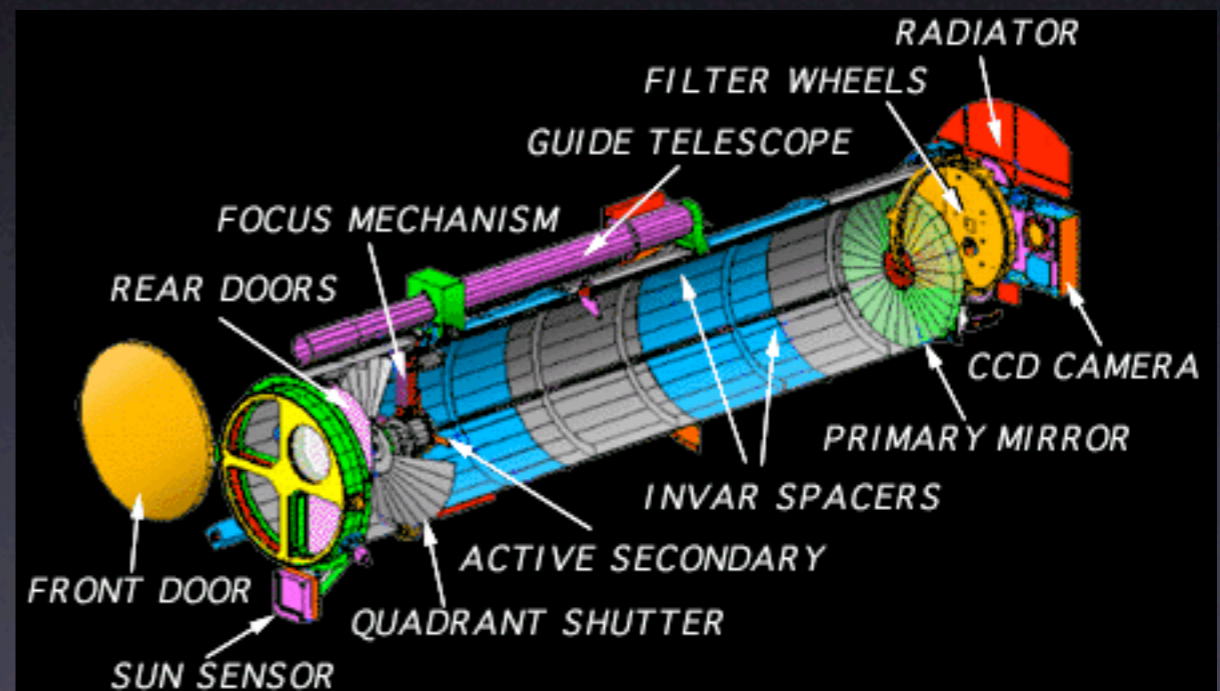
## SUMMARY

30 cm cassegrain normal incidence  
 8.5x8.5 arcmin field of view  
 1 arcsec spatial resolution  
 0.1 arcsec image stabilization  
 Four quadrants for UV and EUV  
 Shutter+ filters for wavelength selection  
 1024x1024 CCD for 0.5 arcsec pixels  
 On-board data handling & compression  
 230 Mbytes on-board storage



## TRACE PASSBANDS

Wavelength (Angstrom)	Width (Angstrom)	Observed	Temperature (1000Kelvin)
5000	broad	continuum	4 - 6.4
1700	200	continuum	4 - 10
1600	275	Cl, FeII, cnt	4 - 10
1550	20	CIV	60 - 250
1216	84	HI Ly- $\alpha$	10 - 30
173	6.4	Fe IX	160 - 2000
195	6.5	Fe XII	500 - 2000
284	10.7	Fe XV	1250 - 4000



# TRACE Cronology

- 1998 Prime Mission (8 Months)
- 1999-2001 SOHO+
- 2003-2005 RHESSI+
- 2006-2007 *“Great Observatory”*
- 2008-2009 *AIA Handoff*

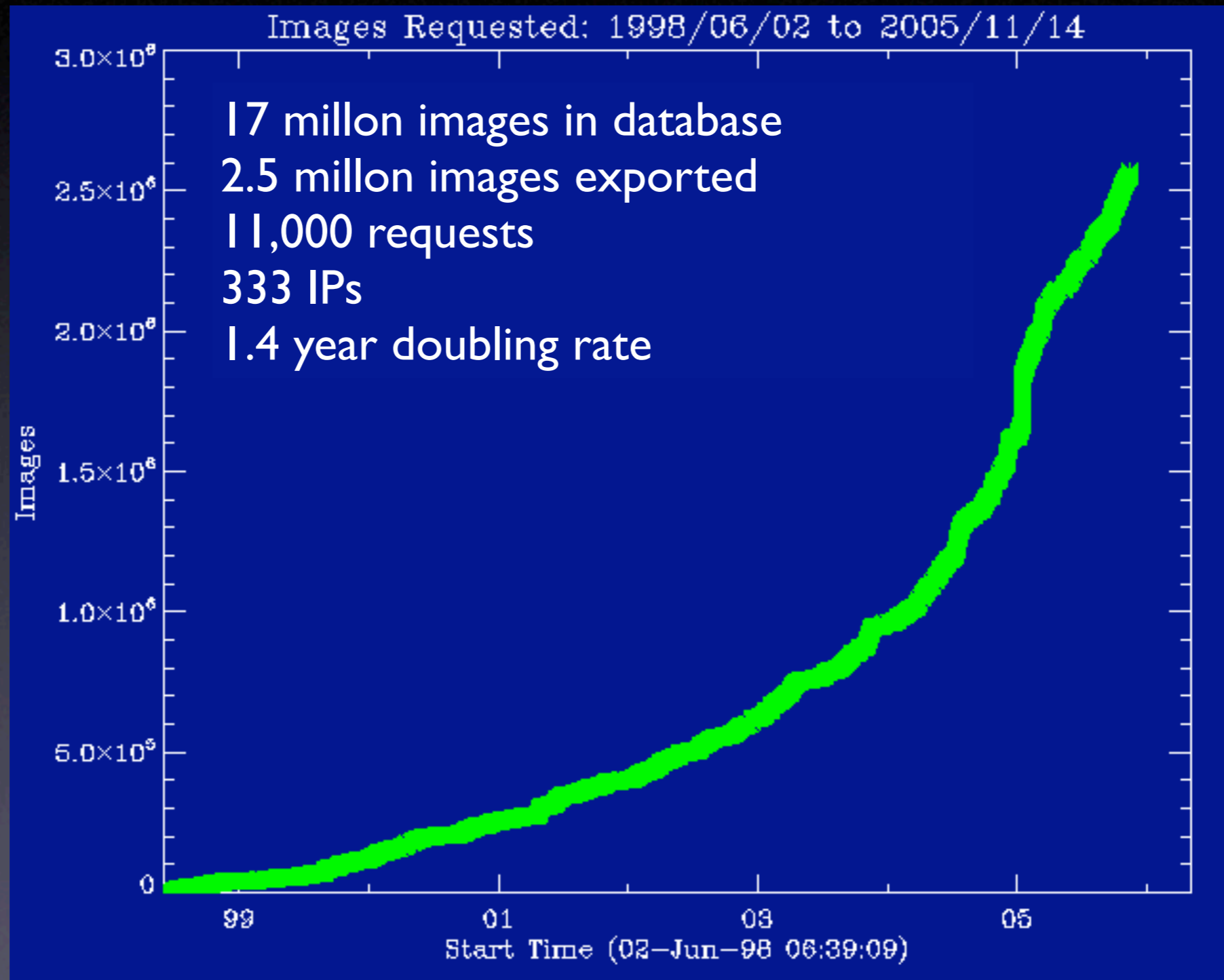
# Prime Mission

- First Open Data PI Mission
  - PI team was not funded to do this
  - Data exports with same access and tools as PI team
  - Cavot Emptor: No promises
- Daily Planning set by prime science goals
  - Some coordination with SOHO, Yohkoh, etc.

# SOHO/RHESSI Era

- Planning Coordination
  - 70% of SOHO JOPs include TRACE since 2002
  - 80% of major RHESSI flares capture by TRACE
- Analysis Software Divergence
  - PI Team relied on custom tool
    - Direct access to data
    - Customized tools for calibrating & analysis
  - SOHO based on SolarSoft tools
    - Calibration and analysis tools in IDL branch

# Data History



# Things to Avoid

- PI focus resulted in lack of metadata
  - No systematic data mining or feature ID
    - *When did TRACE observe sunspots, emerging flux...?*
    - *What is the most popular flare?*
  - Ad-hoc event catalogs, but no formal structure
- Non-standard data structures saved disk space, but bothersome
  - Custom compression limited portability

# Lessons applied to SOT

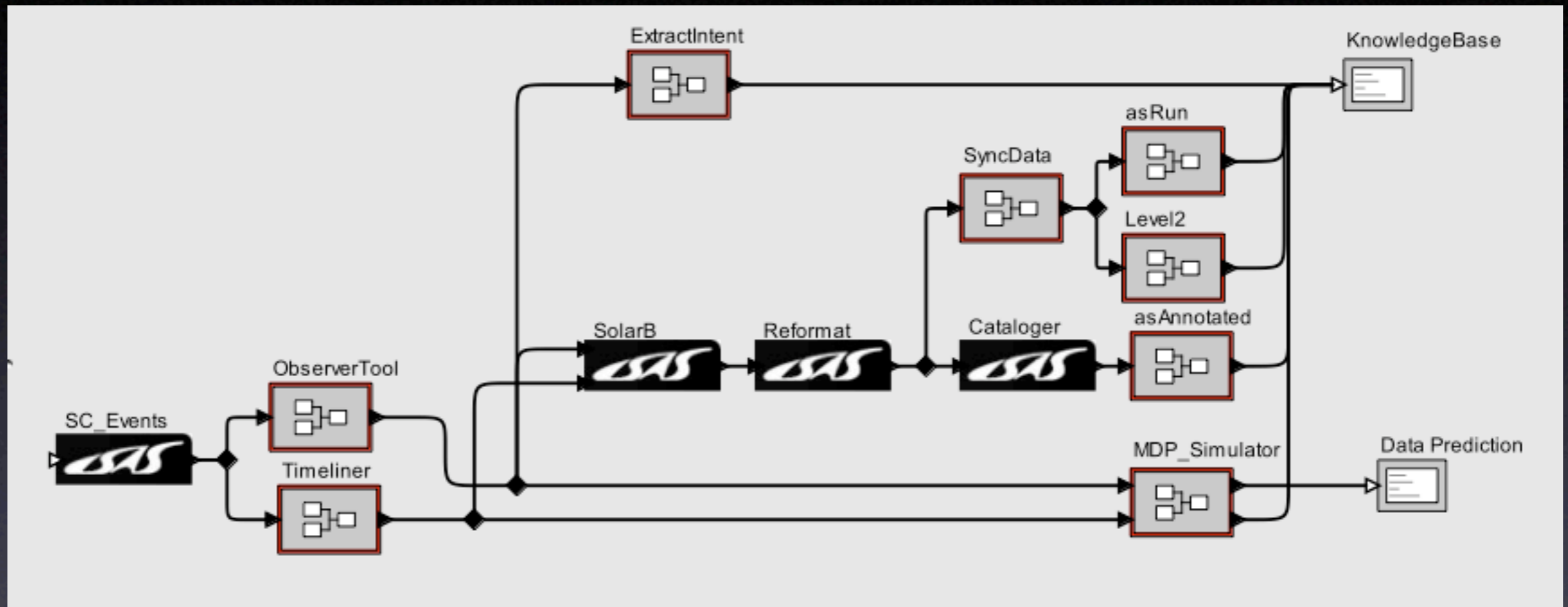
- Observation Knowledgebase including
  - Observation Intent
  - Data Annotation
- Standard formats & tools
  - Similar Directory structure to EUVI
  - Standard FITS files



# Observation KB

- ▼  Observation Intent [Extracted from OBSERVATION Table]
  - OBSTITLE
  - TARGET (A
  - SCI\_OBJ (fr
  - OBS\_DESC
  - JOIN\_SB (E
  - OBS\_ID (Ide
  - JOP\_ID (Ide
  - NOAA\_NUM
  - OBSERVER
  - PLANNER (
  - TOHBANS (
  - ORIGIN (of
  - INSTRUME
  - ▶  Observation As-
  - ▶  Observation As-
  - ▶  Observation Eve
- ▶  Observation Intent [Extracted from OBSERVATION Table]
- ▼  Observation As-planned [from MDP SIMULATOR]
  - MDPPRGVR
  - MDPSEQVR
  - MDPPRMVR
  - MDPPRGNO
  - MDPXRTAE
  - MDPXRTAR
  - MDPXRTFL
  - MDPXRTFL
  - MDPXRTMV
  - Observation P
  - Observation P
  - Predicted Hel
  - Predicted Hel
  - TR\_MODE (t
  - List of predic
  - Tracking soft
  - FOV for main
  - FOV context
  - Predicted cad
  - Predicted Dat
  - ▶  Observation As-
  - ▶  Observation Eve
- ▶  Observation Intent [Extracted from OBSERVATION Table]
- ▶  Observation As-planned [from MDP SIMULATOR]
- ▼  Observation As-run [from CATALOGER]
  - MDPPRGVR
  - MDPSEQVR
  - MDPPRMVR
  - MDPPRGNO
  - MDPXRTAEC
  - MDPXRTARS
  - MDPXRTFLD
  - MDPXRTFLT
  - MDPXRTMVB
  - Actual start tim
  - Actual end time
  - Heliographic C
  - Heliographic Coordinates at end (need a KEYWORD)
  - List of SC pointings during observation
  - ▼  List of observables in observing program
    - cadence for each type
    - number of images of each type
    - some measure of average image quality for each type (TBD)
    - FOV for each type
  - ▶  Observation Event [from ANNOTATION TOOL]
- ▶  Observation Intent [Extracted from OBSERVATION Table]
- ▶  Observation As-planned [from MDP SIMULATOR]
- ▶  Observation As-run [from CATALOGER]
- ▼  Observation Event [from ANNOTATION TOOL]
  - Related data products
  - Event Type {Flare, Jet, Filament Eruption... Bad, etc.}
  - Description
  - Heliographic Location
  - Start time
  - End time
  - Flare flag

# SOT/FPP Data Flow



# TRACE 2.0

PodCasts

Release Date	Description	Artist	Time	Category	Date Added
10/11/05	A summary of test observations collected at...	Neal Hurlburt		Test	10/12/05 4
10/11/05	Integration Tests	Neal Hurlburt	36:00	Test	10/12/05 4
10/11/05	Testing at JAXA, Aug/Sep 2005	Neal Hurlburt			
9/14/05	Recent results from the Lockheed Martin So...	Neal Hurlburt			
9/14/05	As seen in 1600Å on 10 November 2004	Neal Hurlburt			
9/14/05	Sunspot group in AR9715 , 28 Nov. - 6 Dec...	Neal Hurlburt			
9/13/05	X5.7 flare on 14 July 2000 (195? pass band)	Karel Schrijver			
10/14/05	TRACE observations using STD.dynamics o...	TRACE Plan			
9/29/05	TRACE observations using TDT.any_frames ...	TRACE Plan			
9/29/05	TDT.any_frames	TRACE Plan			
9/28/05	TDT.any_frames	TRACE Plan			
9/27/05	TDT.any_frames	TRACE Plan			
9/26/05	TDT.any_frames	TRACE Plan			
9/25/05	TDT.any_frames	TRACE Plan			
9/24/05	TDT.any_frames	TRACE Plan			

**TRACE POD** 5 Total

**Thin filament fibrils block light from...** Karel Schrijver <schryver@lm...> Nov 7, 02:03 PM

This image, taken by TRACE on 21 September 2005, at 03:27 UT, shows bright, high active region loops above the solar limb. With the active region rotated off the visible hemisphere of the Sun, only the high-arching coronal loops remain visible. Seen in projection against that, is a filament that trails the active region. In this image, several thin, dark strands are seen; these are filled with relatively cool material that absorbs the extreme ultraviolet emission from the bright loops behind the filament. The material can be seen to be in continual motion. The entire filament destabilizes in a flare-like eruption just over an hour after this picture was taken, but things settle back again and the filament lives on.

[Read more...](#)

**200+ GigaBytes of TRACE movies in...** Karel Schrijver <schryver@lm...> Nov 3, 06:55 PM

[Read more...](#)

QT files | DVD img files | POD listing

Since its launch in 1998, the Transition-Region and Coronal Explorer, TRACE, has taken over 17 million images of the Sun (as of October 2005). A selection of these images has found its way into a widely diverse set of publications, ranging from scientific studies to the printed newsmedia (and over 200 have been discussed on the TRACE home pages at <http://trace.lmsal.com>). Images sequences have an even greater power to surprise and enchant, as illustrated in the [selection of movies](#) on the TRACE web site. These movies were necessarily short and small, however, to allow easy downloads onto a variety of platforms.

The TRACE team is pleased to announce the completion of three TRACE DVDs that together contain almost 400 movies of a variety of phenomena. They are arranged into three themes: [active regions](#), [flares](#), and [filaments](#) (with a few [quiet-Sun](#) bonus movies on-line only). The individual movie files are [available or](#) Altogether, the movies claim over 200 GB of disk space, with individual file sizes ranging from a few MB to 3.6 GB. The [DVD img files](#) (1.5-3.6 GB) are also available on-line; these may be downloaded to a DVD, using machines that are capable of DVD playing and writing (a fourth [DVD img](#) magnetograms from launch until 2005); the DVDs show all TRACE movies in the coll date, with all materials rescaled to the available screen size of 640x480 pixels; the Q substantial field of view with more pixels.

**Actions:**  
Mail Link to This Page  
Add Bookmark...

VODCasts

Updating "Solar Optical Telescope Test Data"

Nothing Playing

**Evolving Sunspots** 9/14/05  
TRACE Movies of the Day  
Astronomy  
0:21

**The Slinky Flare** 9/13/05  
TRACE Movies of the Day  
Astronomy  
0:07

3 items, 48 seconds, 31.2 MB

RSS Feeds

# AIA Handoff

- Once SDO/AIA is operational TRACE will
  - Cross-calibrate images
  - Used this final calibration to
    - Produce final, calibrated images
    - Reprocess entire archive into standard format with metadata
    - Fold dataset into AIA archive
    - Retire