

FINDING REAL DATA

and not just png pictures and movies



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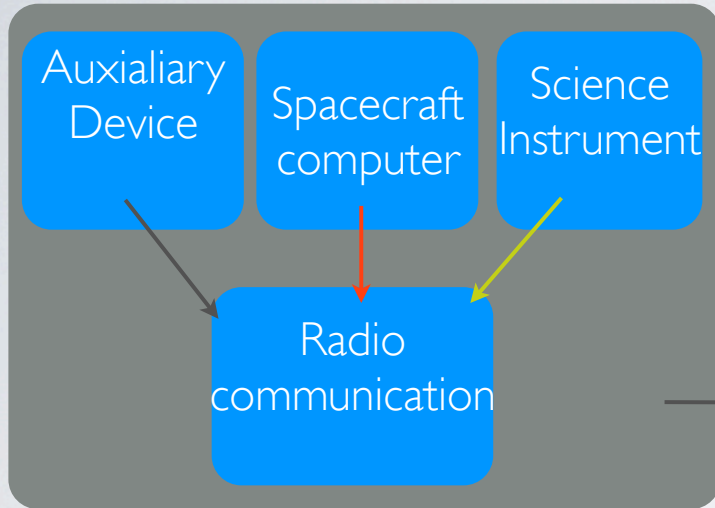
Royal Observatory of Belgium

<http://sidc.be>, <http://proba2.sidc.be>

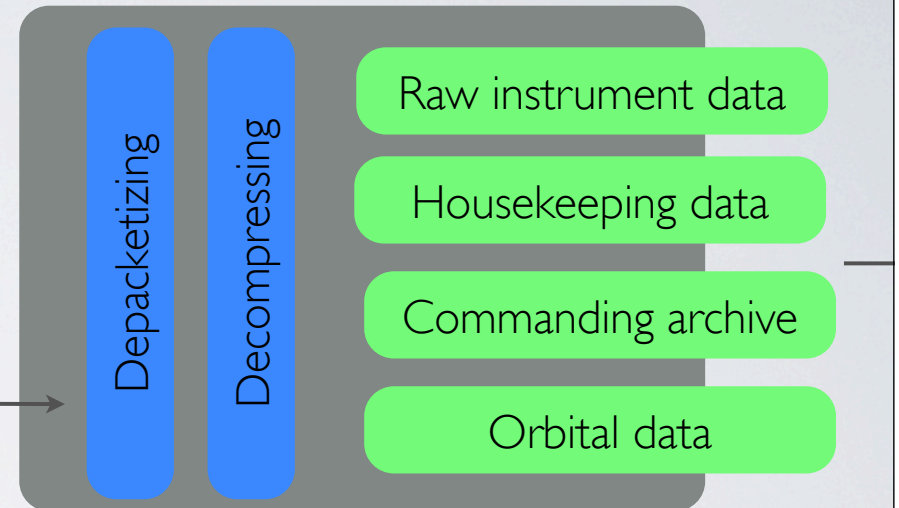


HOW DOES SPACE WEATHER DATA GET ONLINE?

Spacecraft



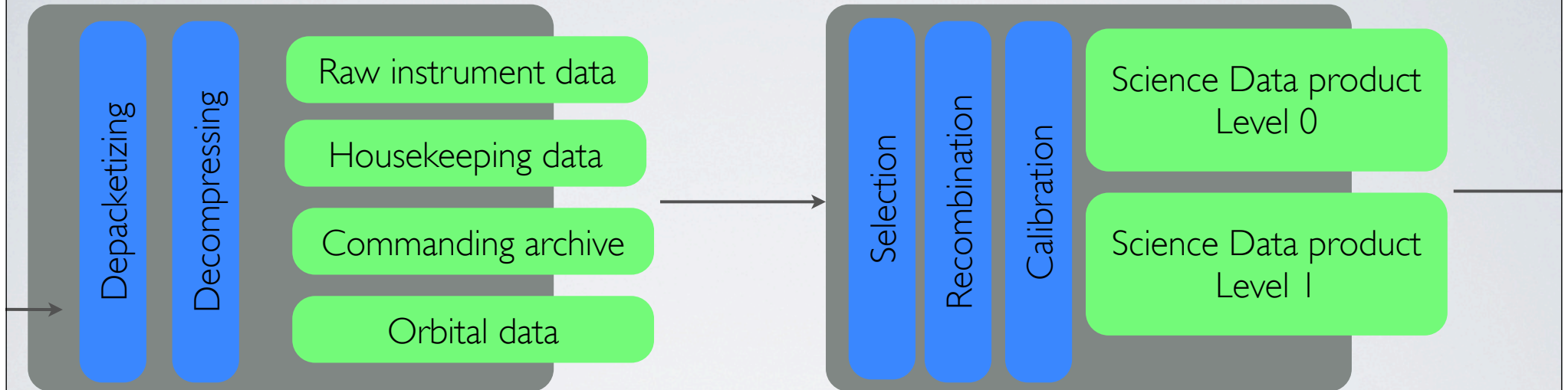
Mission Operations Center



HOW DOES SPACE WEATHER DATA GET ONLINE?

Mission Operations Center

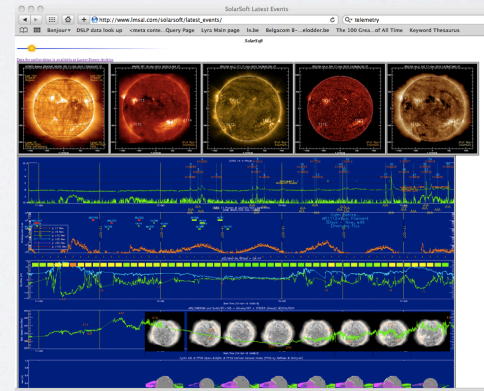
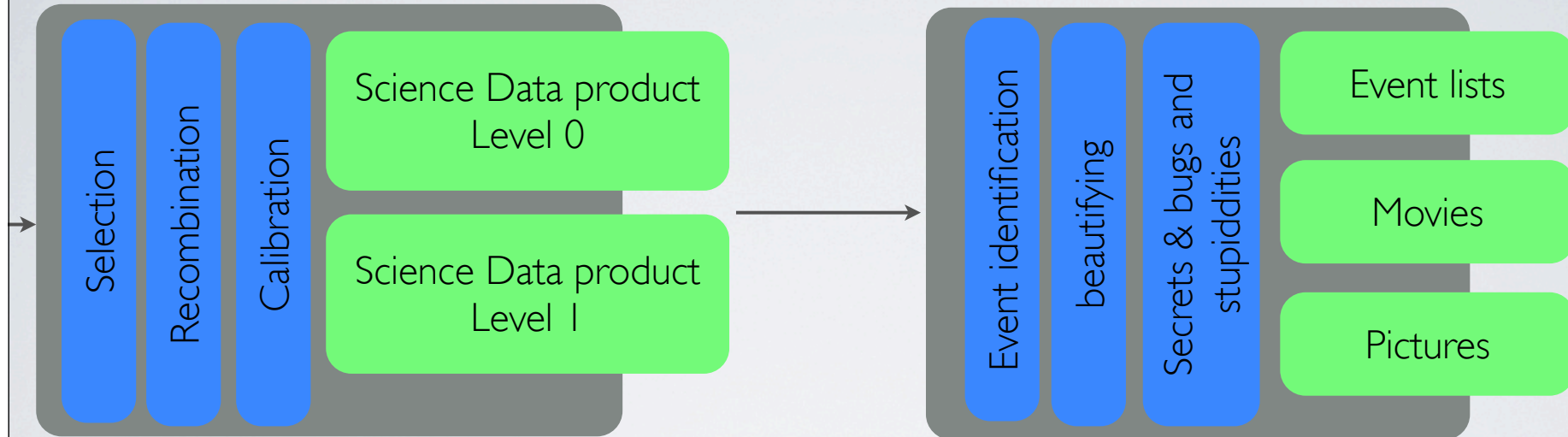
Science Operations Center



HOW DOES SPACE WEATHER DATA GET ONLINE?

Science Operations Center

Space Weather Website



GOOGLE ON "SWAP DATA DISTRIBUTION"

SWAP & LYRA Data Distribution - [PROBA2 SCIENCE CENTER]

http://proba2.oma.be/index.html/Data-download/article/swap-lyra-data-distribui Reader

Bonjour Space Weather Portals DSLP data look up <meta conte...Query Page Lyra Main page In.be Belgacom B-...elodder.be The 100 Grea...of All Time

Modify this article (1) Recalculate this page *

PROBA2 SCIENCE CENTER

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Last update: 14th of October 2010

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SWAP & LYRA Data Distribution

Raw PROBA2 data is received at [ESA's](#) ground station in Redu and transferred to the PROBA2 Science Center (P2SC) via ftp link. Once received by the P2SC, the data are automatically processed, calibrated, and prepared for public distribution. All data are freely available to the public. The links to the FITS files and quicklook data are listed below.

PROBA2 has begun its scientific mission in March 2010 and the data of [SWAP](#) and [LYRA](#) are freely available. Apart from the quicklook images, several levels of science data products are released. Some levels of calibrated data are still under construction or are released in beta version.

For the time being we have online the following FITS files and quicklook PNG files in YYYY/MM/DD directories:

SWAP:

- SWAP raw images, i.e. [level0](#) data, e.g. <http://proba2.oma.be/swap/data/eng/2010/05/01/>
- SWAP calibrated images, i.e. [level1](#) data e.g. <http://proba2.oma.be/swap/data/bsd/2010/05/01/>
- SWAP quicklook data (png files), e.g <http://proba2.sidc.be/swap/data/qlviewer/2010/05/01/>
- SWAP daily movies (mp4 files) at <http://proba2.sidc.be/swap/data/mpg/movies/>

LYRA:

- LYRA raw 'standard' time curves, i.e. [level1](#) data, e.g. <http://proba2.oma.be/lyra/data/eng/2010/05/01/>.

These LYRA FITS files are automatically generated and always show the latest data available. The other data formats listed below are generated quasi-manually and are not yet available for the most recent data. Please contact frank.lyra@sidc.be if you are interested in these.

Go to Calibrated data

Index of /swap/data/bsd/2010/05/01

http://proba2.oma.be/swap/data/bsd/2010/05/01/

Index of /swap/data/bsd/2010/05/01

Name	Last modified	Size	Description
Parent Directory	-		
swap_lv1_20100501_000037.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_000217.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_000357.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_000537.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_000717.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_000857.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_001037.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_001217.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_001357.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_001537.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_001717.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_001857.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_002037.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_002513.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_002653.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_002833.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_003013.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_003153.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_003333.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_003513.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_003653.fits	21-Jun-2010 12:49	2.0M	
swap_lv1_20100501_003833.fits	21-Jun-2010 12:49	2.0M	

yyyy/mm/dd
pick a date from recent weeks
and download the fits file

Click on a File and Save it



Hard core unix & IDL scripting ahead

On Linux:

- go to the Menu (bottom-left)
- Go into “Tools” (5th line in All Applications)
- Click on “XTerm” (at the bottom)

A terminal window with a black background and green text. The text shows a login message, a mail notification, and two terminal commands: 'cd Desktop' and 'ls *.fits'. The output of the second command is 'swap_lv1_20100501_000537.'. Two grey arrows with yellow text point to the commands. The first arrow points to 'cd Desktop' and the second points to 'ls *.fits'.

**Go to Desktop
("cd Desktop")**

**Check if your file is there
("ls *.fits")**

```
Last login: Tue Oct 19 13
You have mail.
david@sol061$ cd Desktop
david@sol061$ ls *.fits
swap_lv1_20100501_000537.
david@sol061$
```


Start IDL with SolarSoft Library

```
david@sol061$ sswidl
SSW  setup will include:  /usr/local/ssl/cactus trace swap>

Type <sswidl> to start SSW IDL
-----
Running SSW, Last Updated: Wed Nov 2 22:22:51 GMT 2005

PROBLEMS? - e-mail TO: freeland@penumbra.nascom.nasa.gov
-----
IDL Version 7.0, Mac OS X (darwin i386 m32). (c) 2007, ITT Visual Information Solutions
Installation number: .
Licensed for use by: IA-BAS

Executing SSW IDL_STARTUP for: GEN
```

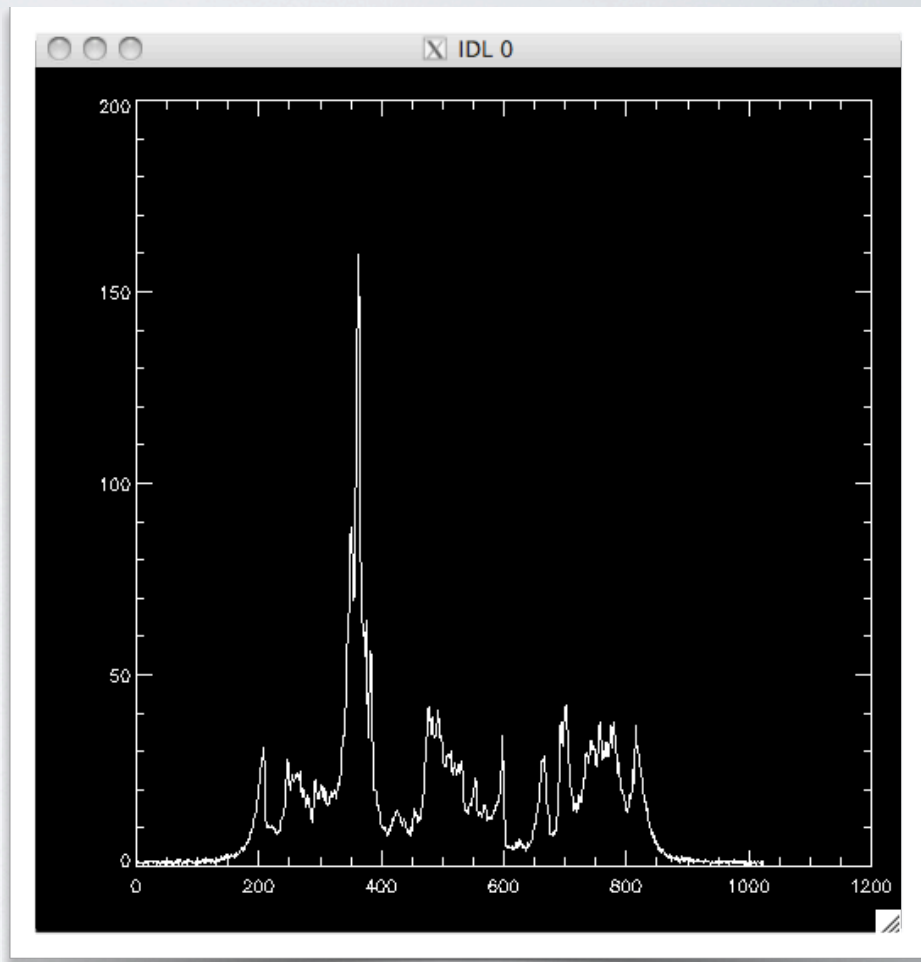
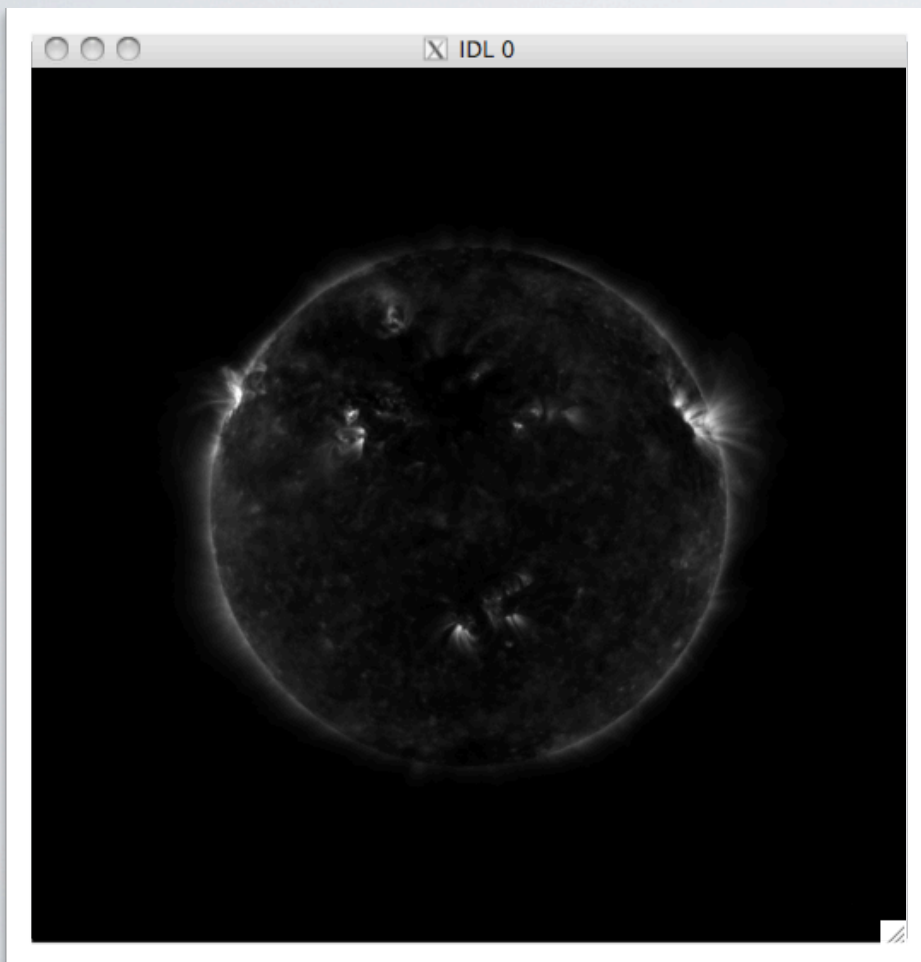
```
IDL> █
```

```
IDL> image = readfits('swap_lv1_20100501_000537.fits', header)
% Compiled module: READFITS.
% Compiled module: SXPAR.
% Compiled module: GETTOK.
% Compiled module: VALID_NUM.
% READFITS: Now reading 1024 by 1024 array
% Compiled module: SXADDFPAR.
IDL> █
```

Read your image

```
IDL> help, image
IMAGE      DOUBLE      = Array[1024,1024]
IDL> window, xs=1024, ys=1024
IDL> tvscl, image
IDL> plot, image[512,*]
IDL> █
```

Explore the image

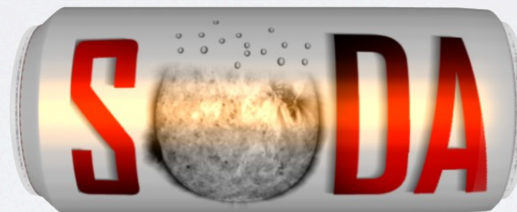


Explore the header

```
IDL> more, header
% Compiled module: M...
% Compiled module: TAU...
% Compiled module: FILE...
SIMPLE = T / Written by IDL: Tue Jun 15 11:46:56 2010
BITPIX = 16 / number of bits per data pixel
NAXIS = 2 / number of data axes
NAXIS1 = 1024 / length of data axis 1
NAXIS2 = 1024 / length of data axis 2
COMMENT -----
FILENAME= 'swap_lv1_20100501_000537.fits' / FITS filename
FILE_TMR= 'swap_00254522136253_f7e46544.fits' / SWTMR filename
FILE_RAW= 'BINSWAP201005010005510000054857PROCESSED' / raw telemetry filename
FILE_TAR= 'BINSWAP_1132_SVA1_2010.05.01T02.29.20.tar' / raw telemetry package
COMMENT -----
DATE = '2010-06-15T11:46:56' / UTC time of FITS file creation
DATE-OBS= '2010-05-01T00:05:37.173' / UTC time of observation
COMMENT -----
LEVEL = 1 / data processing level
CREATOR = 'P2SW_PREP.PRO v0.9' / FITS creation software
ORIGIN = 'ROB-SIDC' / Royal Observatory of Belgium
TELESCOP= 'PROBA2' / satellite name
INSTRUME= 'SWAP' / instrument name
OBJECT = 'Sun EUV' / object observed
FILTER = 'A1' / Aluminum filter
< Press Spacebar to continue, ? for help >
```

[GOOGLE ON "SWAP FITS HEADER"](#)

GETTING FITS FILES IS
COMPLICATED



GOOGLE ON "SOTERIA ONLINE TOOLS" GO TO SOTERIA DATA ARCHIVE

use a sample query : provider="ORB" and instrument="H-ALPHA"
to see more help...

Google like interface

name	type	description
camera		
provider	string	
dataset	string	
endDate		
expTime		
date-obs	Date	Time and date at which this image was taken
startDate		

try some searches:
date-obs > "2010-02-01"
date-obs < "2003-03-01"
date-obs > "2008-03-01" and date-obs < "2008-03-02"
date-obs > "2009-03-03" and instrument="H-ALPHA"

YOUR TURN:

- **download some USET Halpha or WHITE-LIGHT FITS files**
- **open them in IDL**
- **try to find sunspot (remember that last solar max was in the year ...)**