

# Solar imaging on a budget

Solar imaging with a webcam and a  
Coronado PST

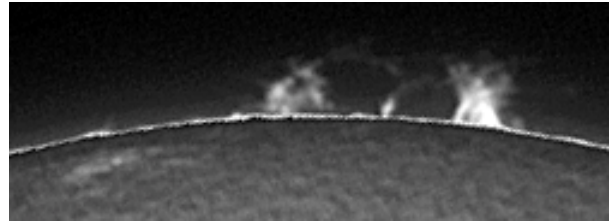


*This is just a reaching hand for those who wants  
to do some solar imaging with a webcam.  
It's just the way I do it, not the ONLY way!  
So, trying and learning is the best way to solve  
the solar imaging puzzle...*



## What do you need?

- Coronado PST
- Motor driving equatorial mount
- Philips ToU-webcam
- 2X Barlow lens
- A good computer
- The necessary software
- Sunshine...lots of it
- And last but not least: a cold beer on a hot summer day! ;)



## The setup

Set up the PST and level at north. It is important to track the Sun on an equatorial driven mount to keep the Sun centered on the ccd-chip.

I have mine piggybacked on an 8" SCT. >>



## The webcam

Cheap webcams suitable for solar-imaging:

- **Philips ToUcam PRO I, II**
- **Philips Vesta PRO**
- **Quickcam PRO 4000**

I use a black & white RAW modded ToU-camII (SC3). >>



My cam has a nosepiece. Otherwise, use a MOGG adapter for connecting the webcam to the PST. >>



## Getting into focus

To get into focus with a PST and webcam, you need the frontlens of an 2X barlow:



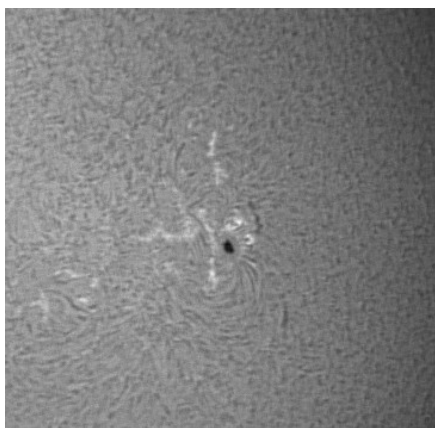
Then, the PST works @ f/15

My PST also comes in good focus with a Tele Vue 2,5X Powermate:

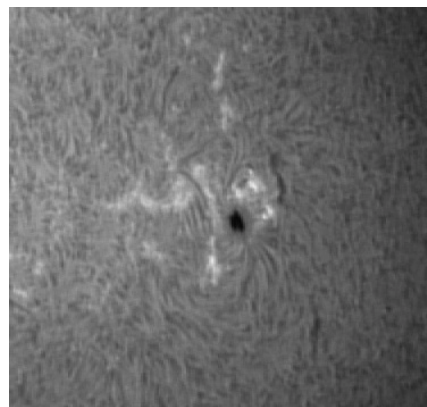


Then, the PST works @ f/25

## Sunspot 933



@ f/15



@ f/25

## Get out of the Sun to get good focus...

Two ways to get good focus on your computerscreen:



get your room as dark as possible or...



use a cardboard box!

## Software

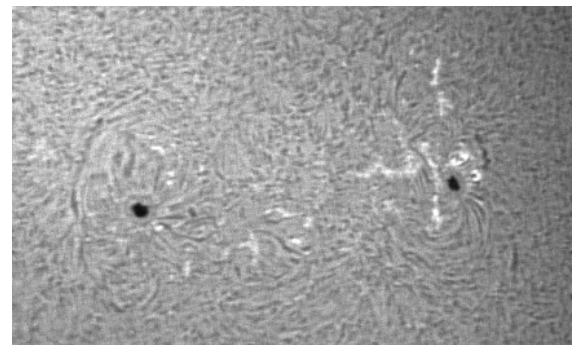
Some useful software for imaging and processing:

- Original webcam drivers
- Registax V4
- <http://www.astronomie.be/registax/>
- K3ccdTools
- <http://www.pk3.org/Astro/index.htm?k3ccdtools.htm>
- Photoshop, Paintshop Pro or ImagesPlus.

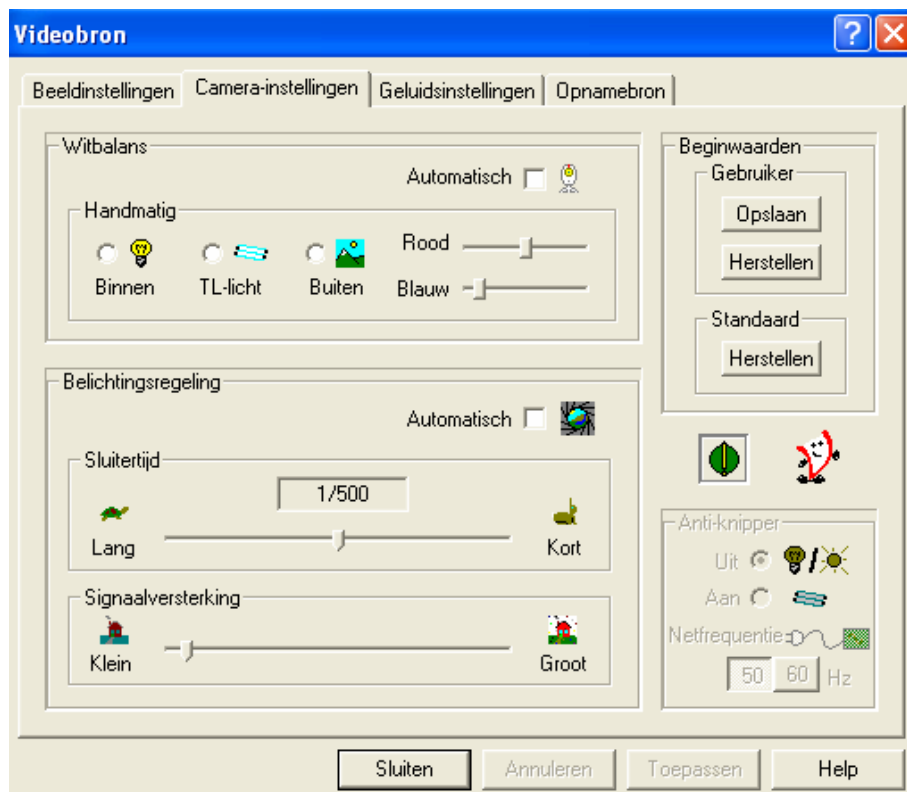
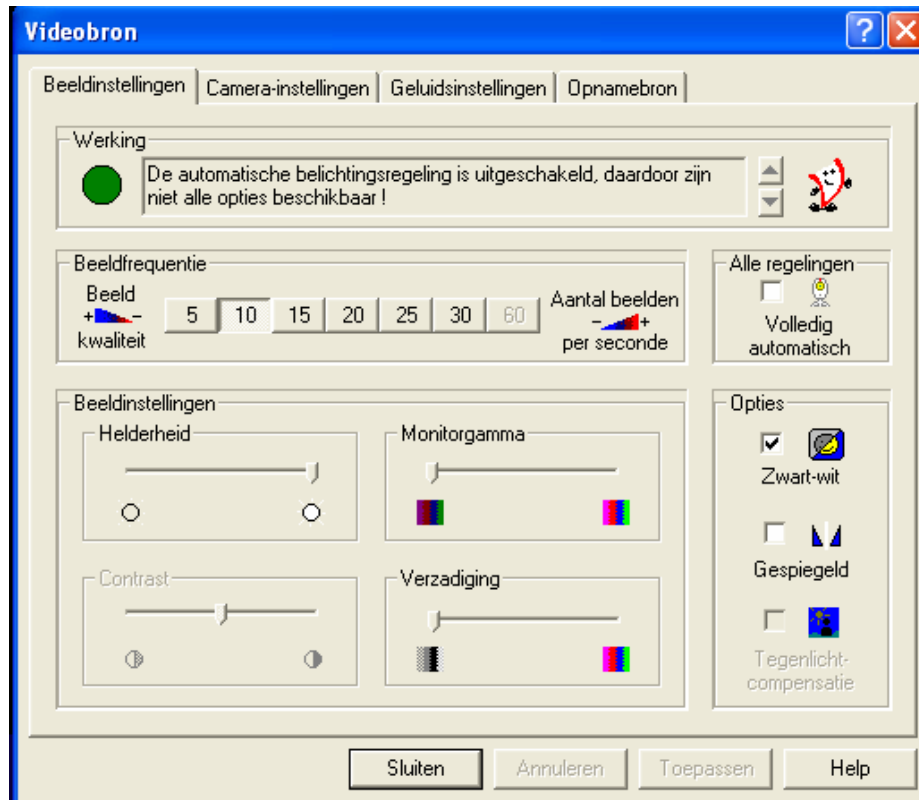


## Capturing some frames

- Set image format at 640X480 pixels
- Shoot short AVI's of about 30 – 45 seconds
- Use framerate of 10 – 15 frames/second
- Always capture in monochrome, black and white

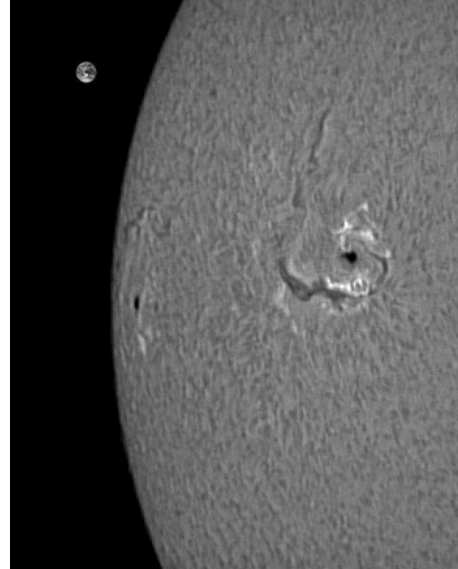


## Imaging Parameters



## Imaging Parameters

- Brightness: > as possible
- Gamma: < as possible
- Contrast: 50%
- Saturation: 0%
- Mode: black/white
  
- Exposure time:
  - Prominences: 1/33 – 1/100sec.
  - Sunspots: 1/500 – 1/1000sec.
- Gain: < as possible



## Captured some AVI's..., what's next?

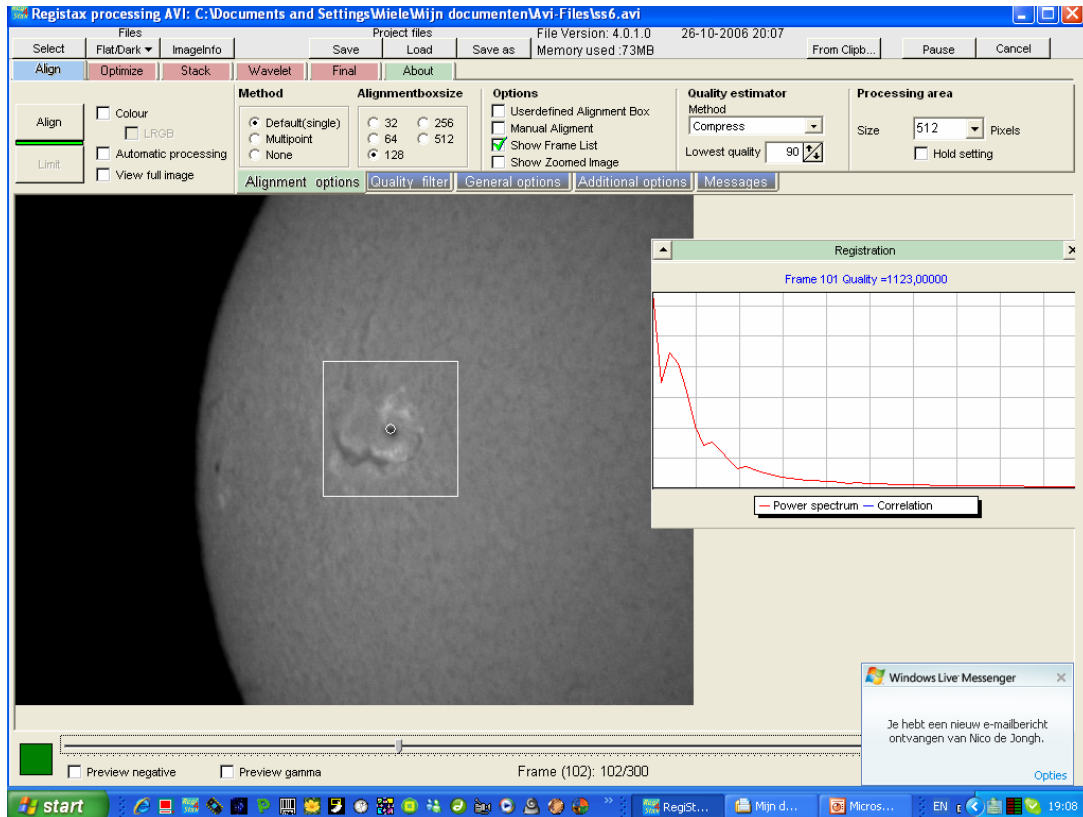
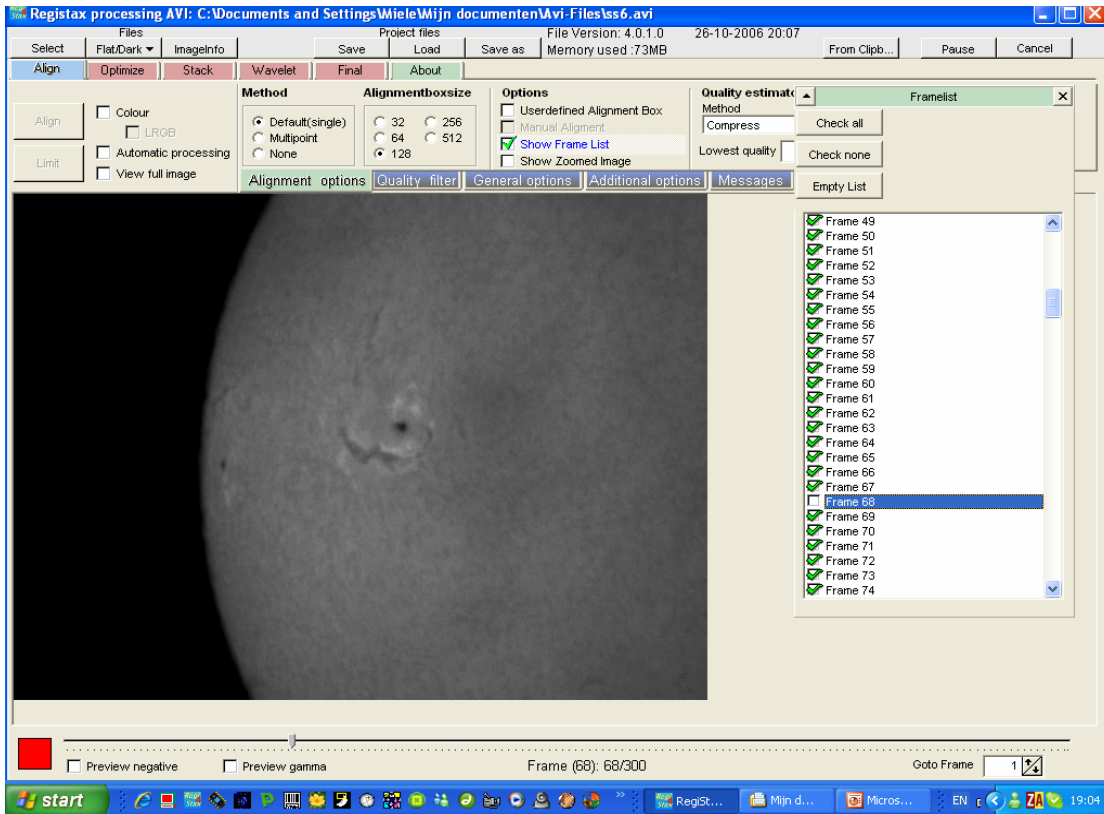
Captured some AVI's and ready to align.  
Open Registax and select an AVI-file.

## Using Registax

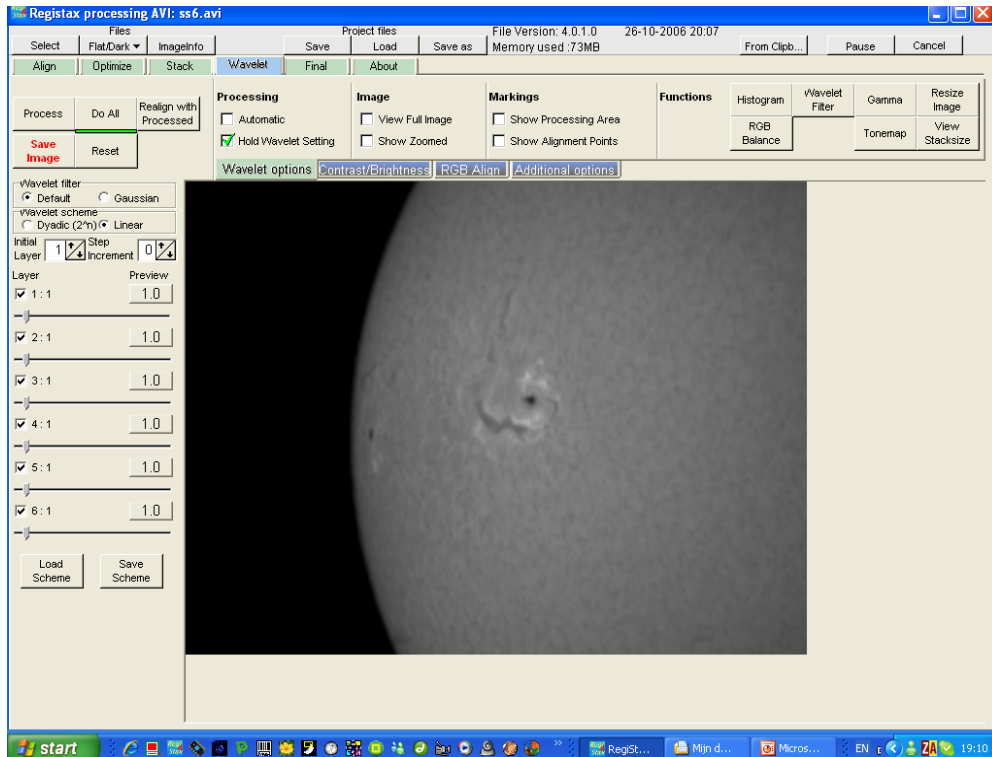
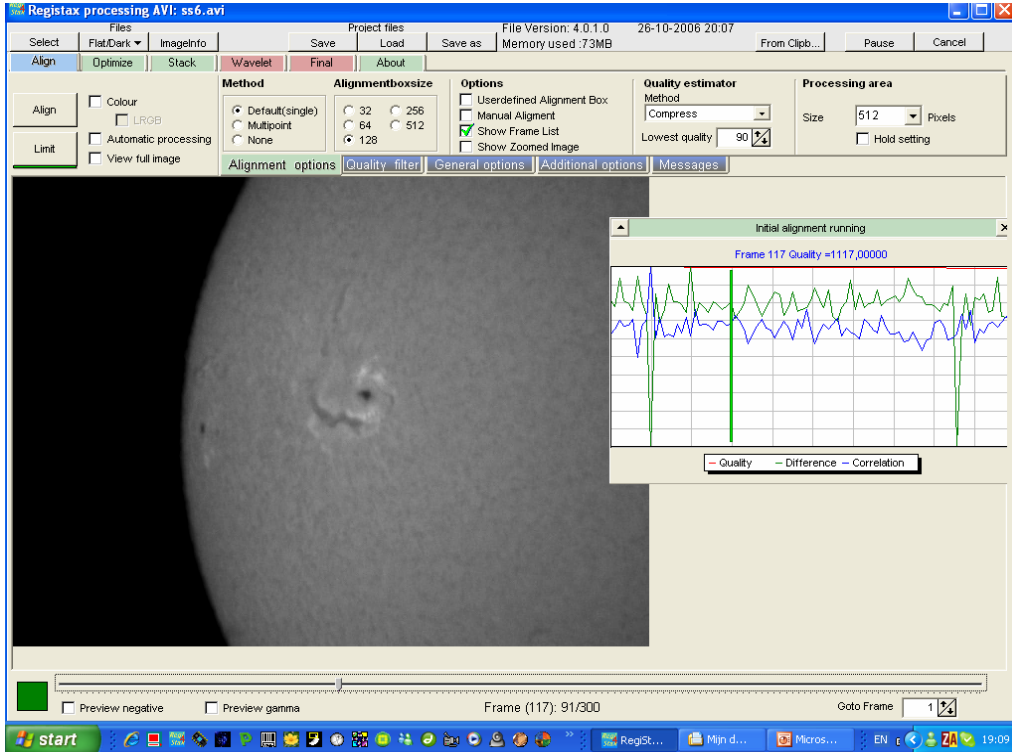
- Select an AVI file
- Uncheck all bad frames
- Select a reference frame
- Choose an alignmentbox size and put it on a contrasty detail like a spot.
- Set the Quality Estimate on Compress and lowest quality on 90%
- Push the align button
- Registax will now align the images from best to worse

See next 2 figures

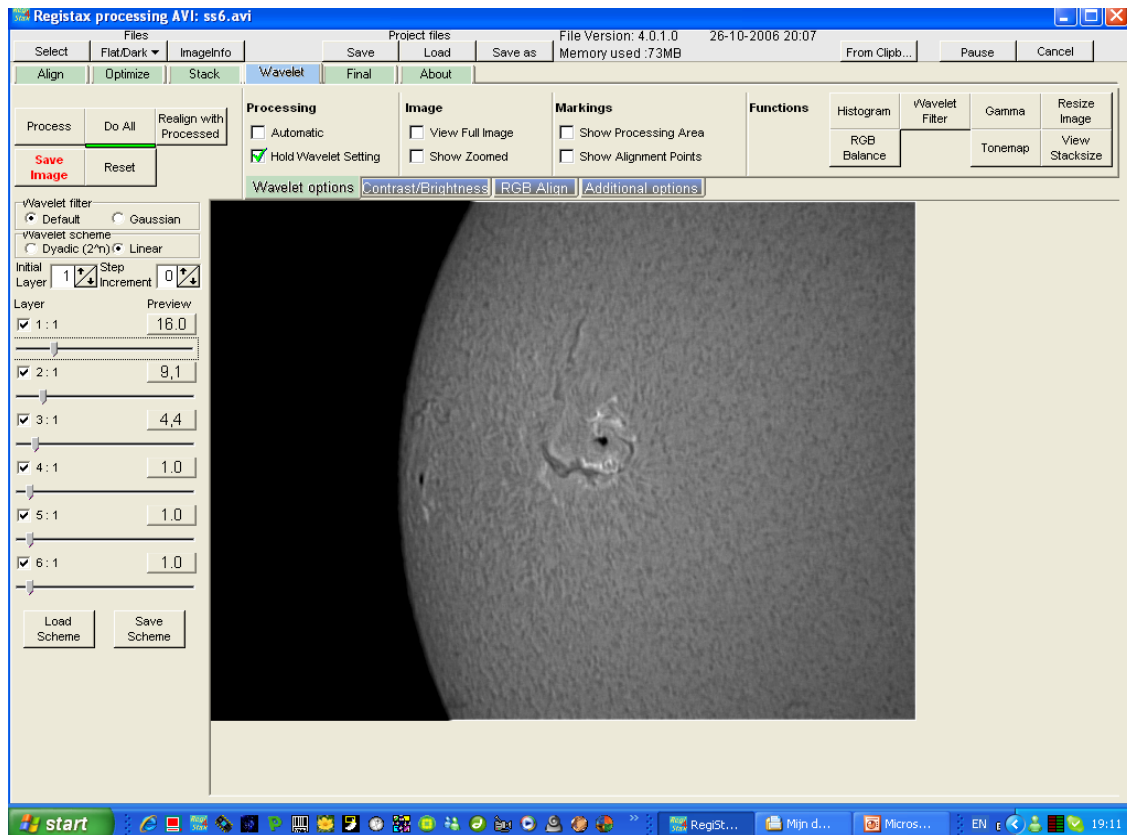
>>



- Choose the limited frames to stack, with the slider at the bottom of the screen
- Push the Limit button
- Registax will now stack all selected frames
- You end up with the Wavelet screen
- See next 2 figures



- Now you can set the wavelets the way you like, just don't overdo it.
- Push the Do All button
- There is a lot more you can do in this screen, just try it out.
- Save as TIFF or FITS size



- After you saved your images, you can process them further with Photoshop or Paintshop.
- Just try Levels, Curves, Shadows/Highlights and Unsharp Masking.
- I use a H-alpha colorisation AVL, but you can give the Sun a real nice color with Colorbalance and Channelmixer too!. Just playing with those sliders ;)

**Hopefully you are now a step closer...**



**to solve the solar imaging puzzle...**

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