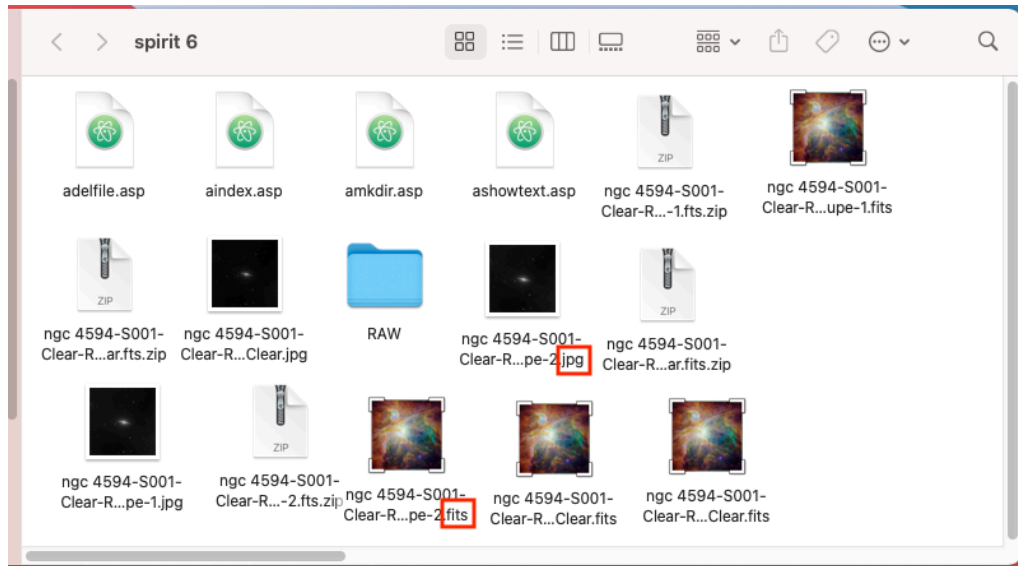


## Using FITS Liberator to access high quality images from SPIRIT

When you download your pictures from the FTP server, you will have your picture in two formats: .jpg and .fits. You will have to unzip your .fits files to use them.

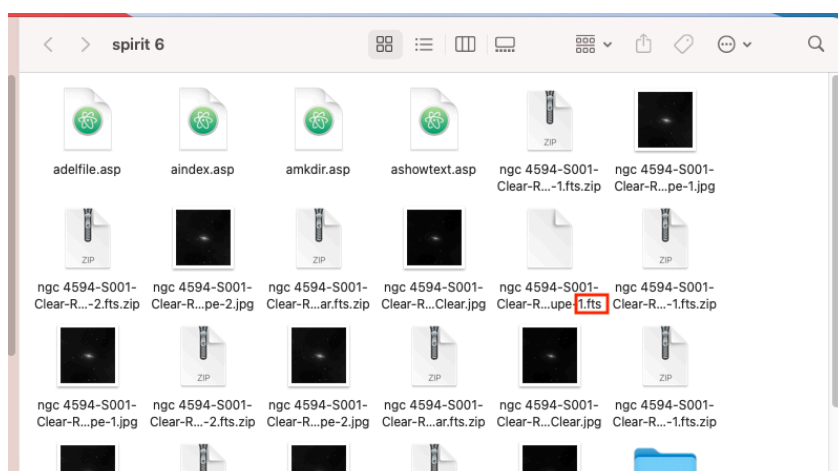


FITS Liberator is software that allows astronomical FITS format images to be viewed and modified. FITS images are used predominantly for science but can also be used in astrophotography. Unlike JPEG versions of *SPIRIT* images, FITS versions contain the original uncompressed data, and should be used when creating high quality images.

The ESA/ESO/NASA FITS liberator application can be downloaded from:

<https://noirlab.edu/public/products/fitsliberator/>

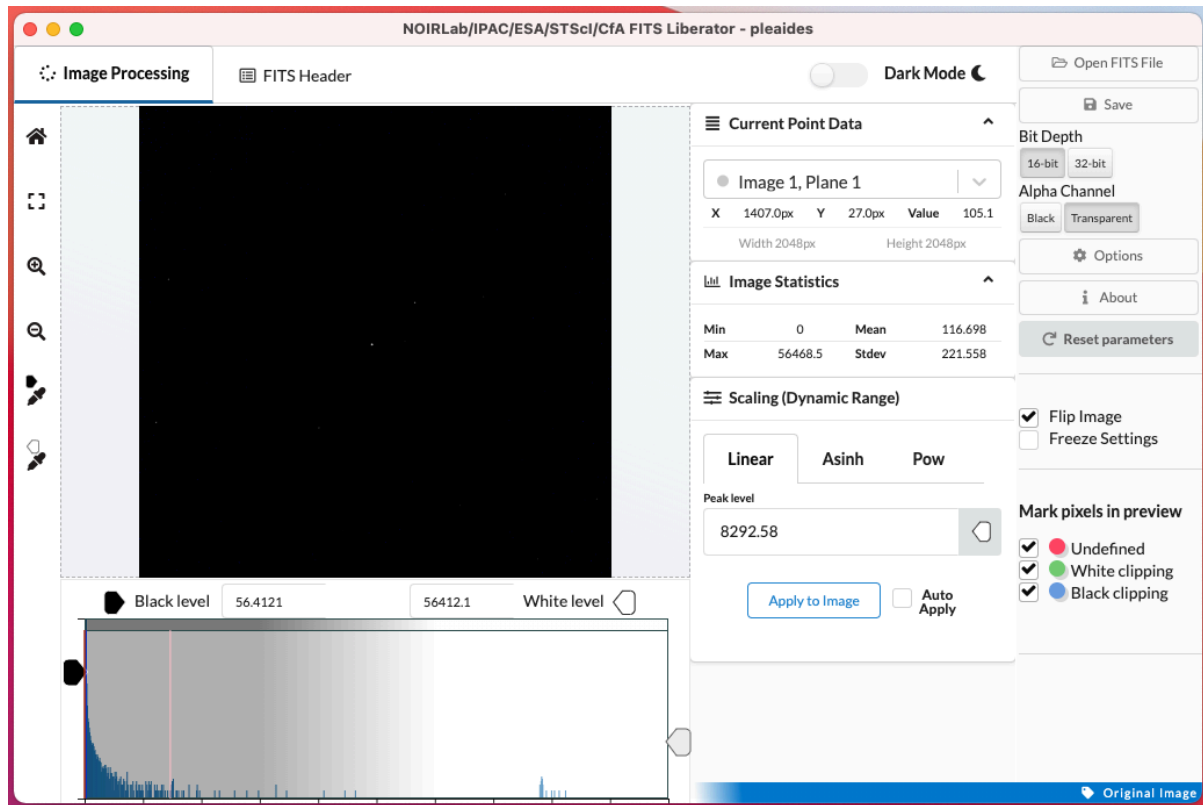
If you are having trouble opening your fits files, they may be named as .fts files. If this is the case, rename them to end in .fits and they should open.



## Running FITS Liberator

FITS Liberator is used to convert FITS files into TIFF files, so that they can be processed using applications such as Adobe Photoshop.

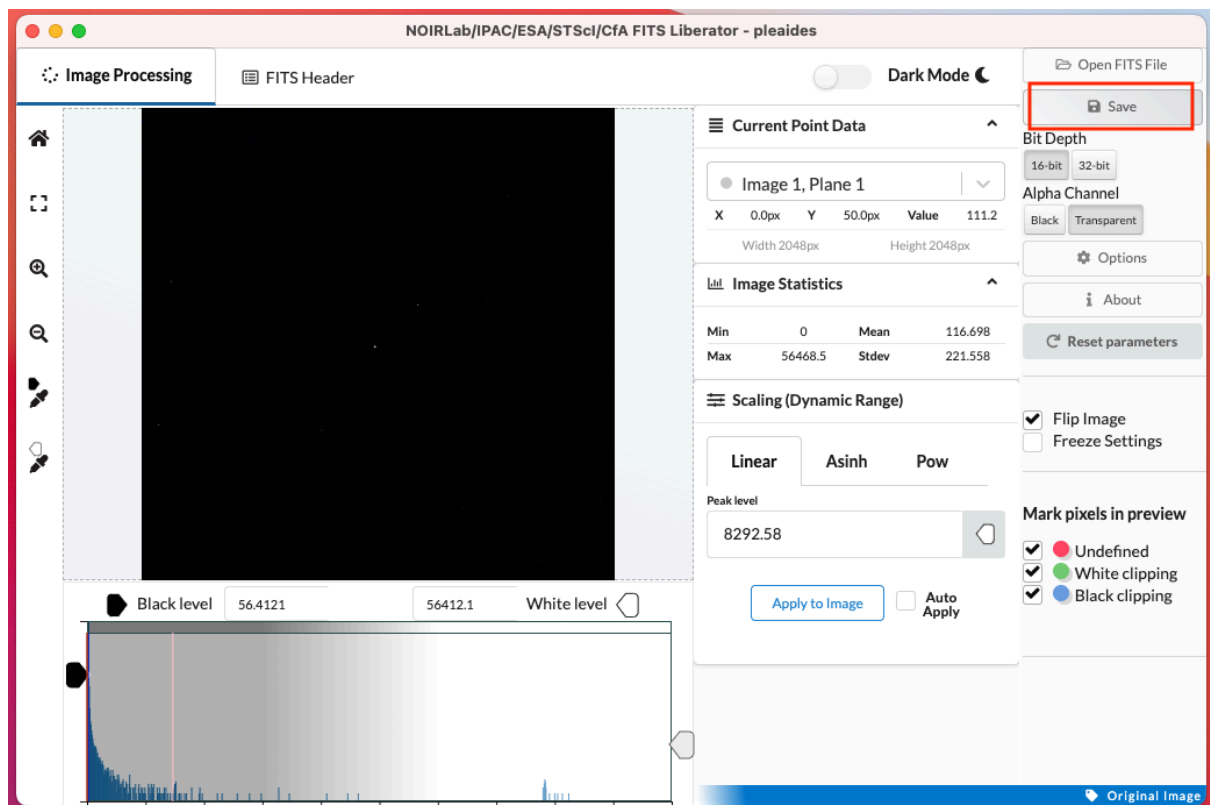
Start the application and select your FITS file for viewing. The **Processing** tab provides a view of your image together with a number of other values.



FITS liberator may scale your image automatically. Before saving as a TIFF file, it is important to reset the histogram so that no data is lost. This is achieved by 'dragging' the white and black points to the extreme ends of each graph.



With the histogram set to include the entire range, select **Save** to save as a TIFF file.



FITS liberator can also be used to examine the FITS header in your images. This provides a useful way to check target and exposure details.

NOIRLab/IPAC/ESA/STScI/CfA FITS Liberator - pleiades

Image Processing **FITS Header** Dark Mode

Open FITS File Save

Bit Depth 16-bit 32-bit

Alpha Channel Black Transparent

Options About

Reset parameters

Flip Image Freeze Settings

Mark pixels in preview

- Undefined
- White clipping
- Black clipping

Original Image

```

SIMPLE = T
BITPIX = -32 /8 unsigned int, 16 & 32 int, -32 & -64 real
NAXIS = 2 /number of axes
NAXIS1 = 2048 /fastest changing axis
NAXIS2 = 2048 /next to fastest changing axis
BSCALE = 1.0000000000000000 /physical = BZERO + BSCALE*array_value
BZERO = 0.0000000000000000 /physical = BZERO + BSCALE*array_value
DATE-OBS= '2021-04-19T10:48:22' / [ISO 8601] UTC date/time of exposure start
EXPTIME = 1.000000000000E+000 / [sec] Duration of exposure
EXPOSURE= 1.000000000000E+000 / [sec] Duration of exposure
SET-TEMP= -20.0000000000000000 /CCD temperature setpoint in C
CCD-TEMP= -19.9687500000000000 /CCD temperature at start of exposure in C
XPIXSZ = 18.0000000000000000 /Pixel Width in microns (after binning)
YPIXSZ = 18.0000000000000000 /Pixel Height in microns (after binning)
XBINNING= 2 / Binning level along the X-axis
YBINNING= 2 / Binning level along the Y-axis
XORGSUBF= 0 /Subframe X position in binned pixels
YORGSUBF= 0 /Subframe Y position in binned pixels
READOUTM= 'Raw' / Readout mode of image
FILTER = 'Clear' / Filter name
IMAGETYP= 'Light Frame' / Type of image
FOCALLEN= 2523.7 / Focal length of telescope in mm
APTDIA = 350.0000000000000000 /Aperture diameter of telescope in mm
APTAREA = 96211.277693510056 /Aperture area of telescope in mm^2
EGAIN = 1.2599999904632568 /Electronic gain in e-/ADU
SBSTDEVER= 'SBFITSEXT Version 1.0' /Version of SBFITSEXT standard in effect
SWCREATE= 'MaxIm DL Version 6.14 180825 2HH6C' /Name of software
SWSERIAL= '2HH6C-79A5X-A9EU7-27SY4-27JPJ-TY' /Software serial number
SITELAT = '-32 18 35' / Latitude of the imaging location
SITELONG= '115 57 19' / Longitude of the imaging location
JD = 2459323.9502546298 /Julian Date at start of exposure
JD-HELIO= 2459323.9452021788 /Heliocentric Julian Date at exposure midpoint
OBJECT = 'ic 2602' / Target object name
TELESCOP= 'SPIRIT 4' / Telescope name
INSTRUME= 'SBIG STX-16803 3 CCD Camera' / Detector instrument name
OBSERVER= 'SPIRIT User 4' / Observer name
NOTES = 'Mardella Observatory'
  
```