

Extended Sources

Rodolfo Montez Jr.

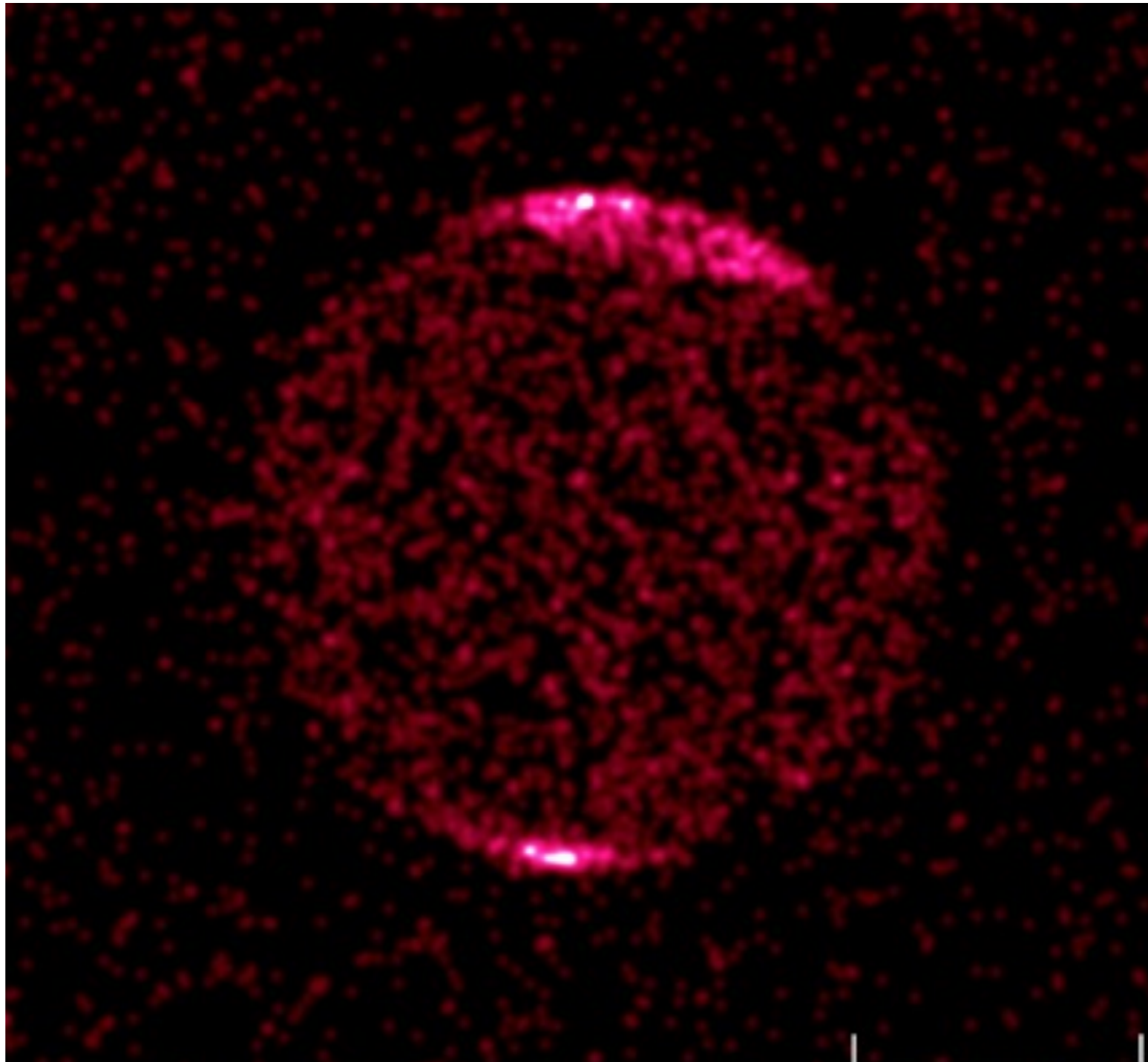
Find many more
examples at this guide!

<http://cxc.harvard.edu/ciao/guides/esa.html>

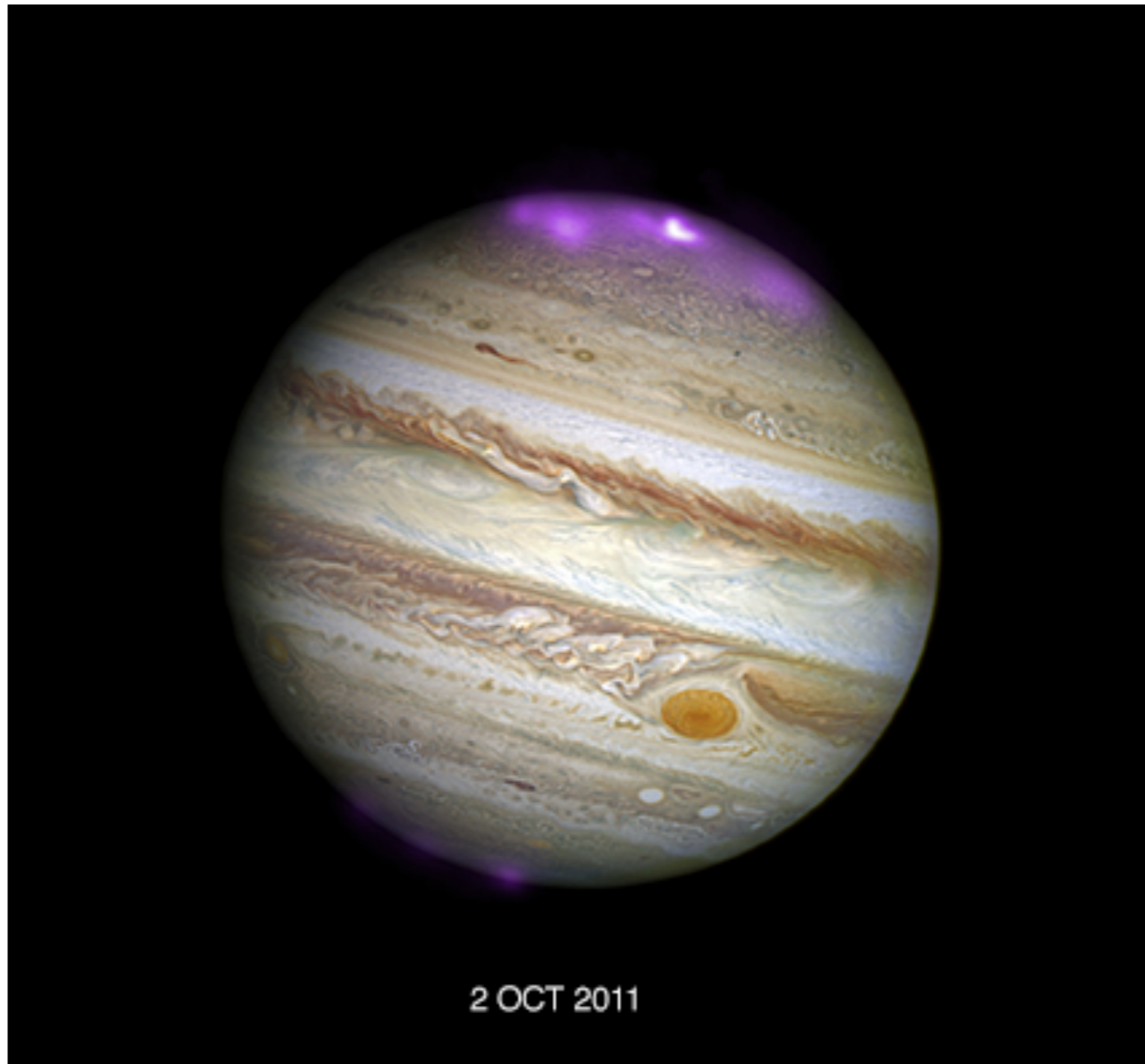
Types of Extended Sources

1. Planets and Comets
2. Stars (well not the star, but stuff around the star)
3. Supernova Remnants
4. ISM
5. Galaxies
6. Clusters of Galaxies

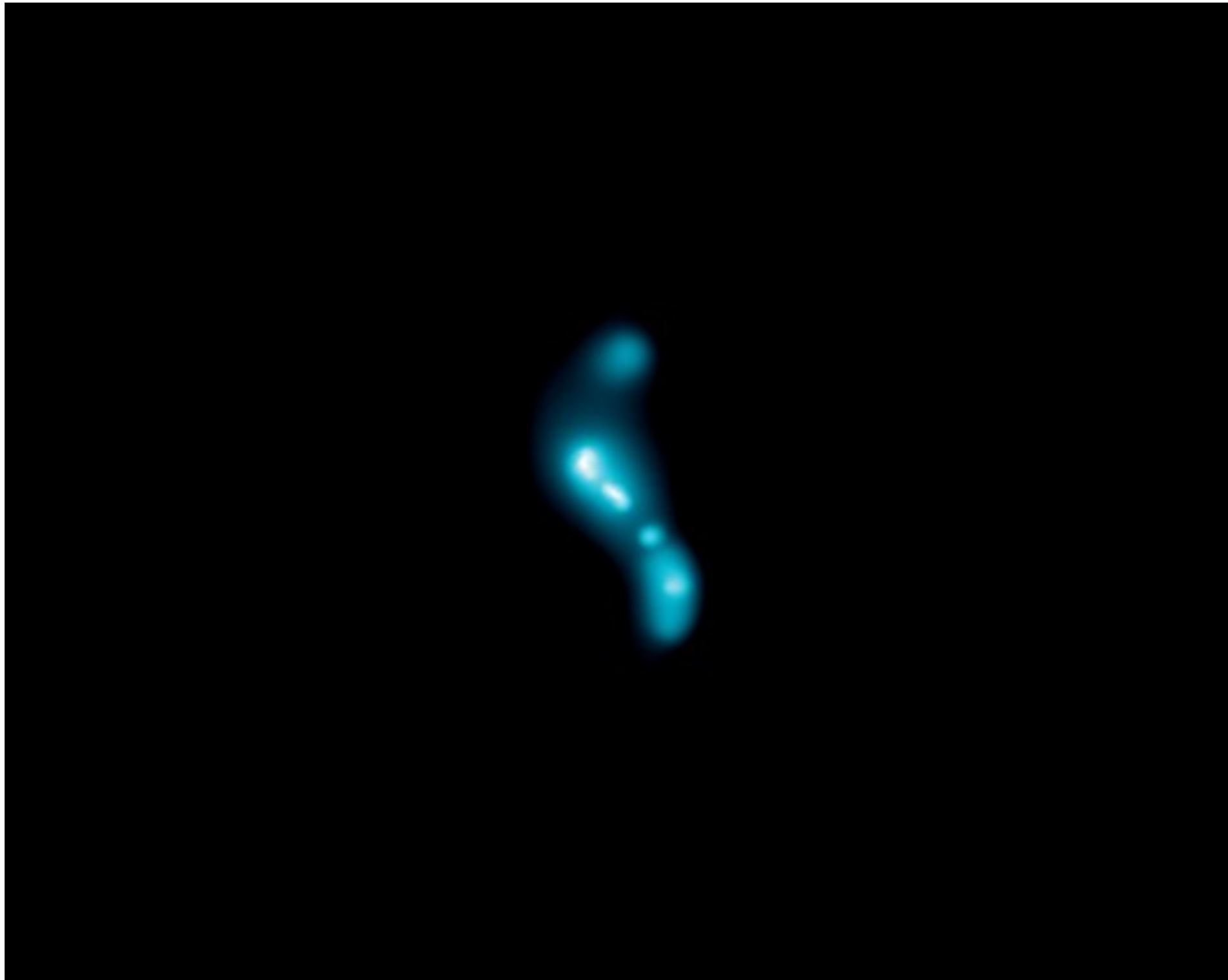
Types of Extended Sources



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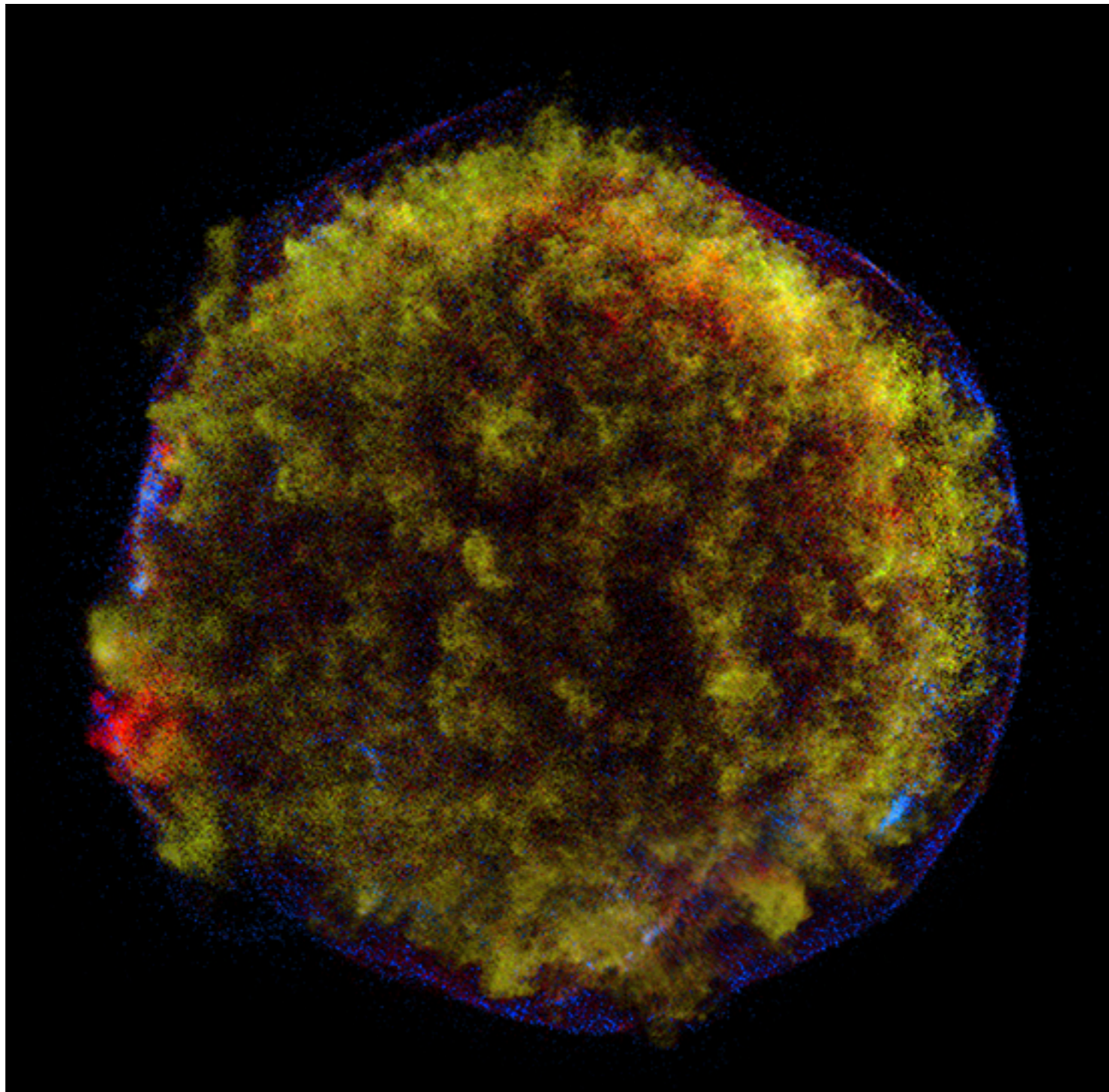
Types of Extended Sources



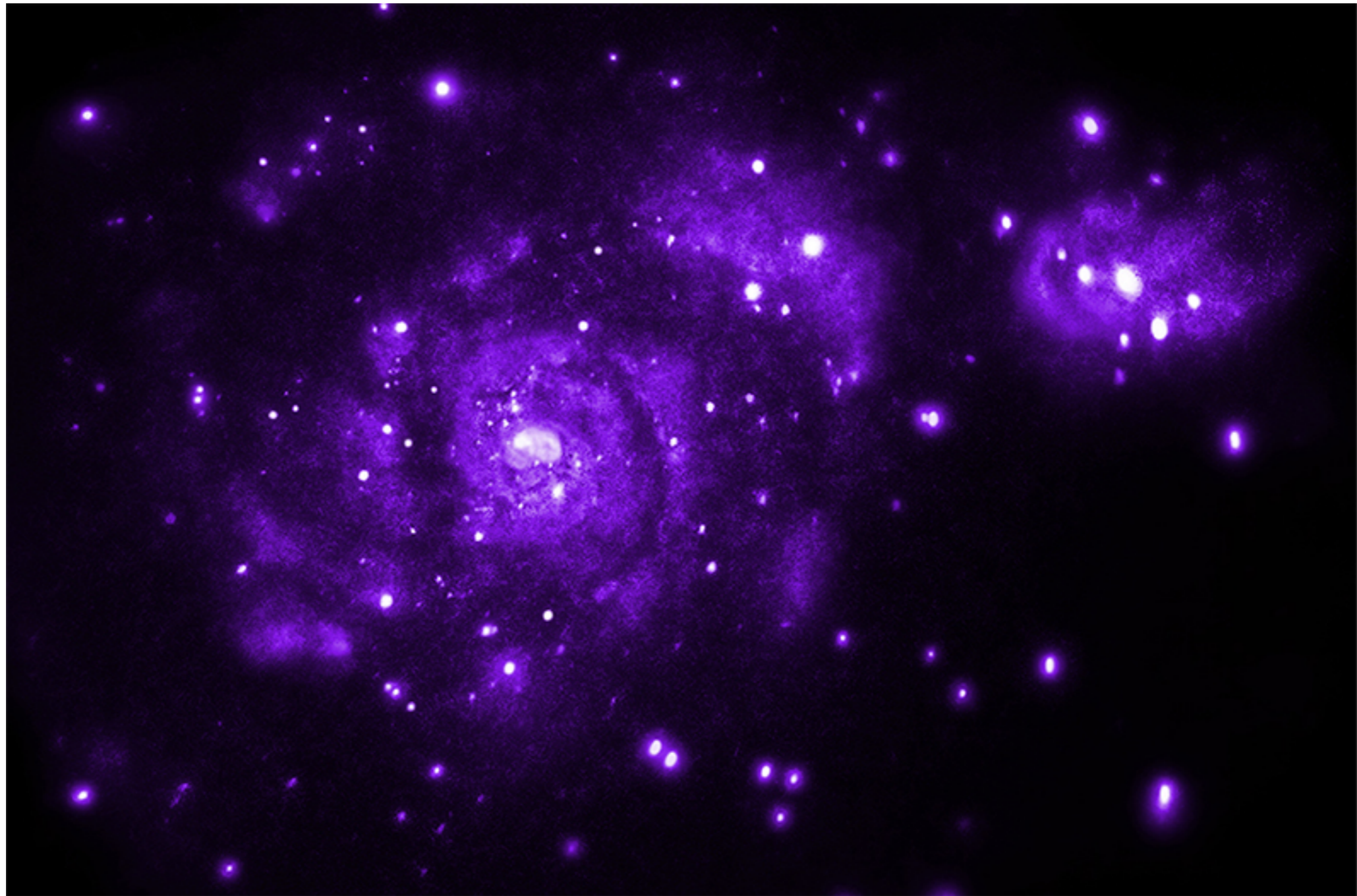
Types of Extended Sources



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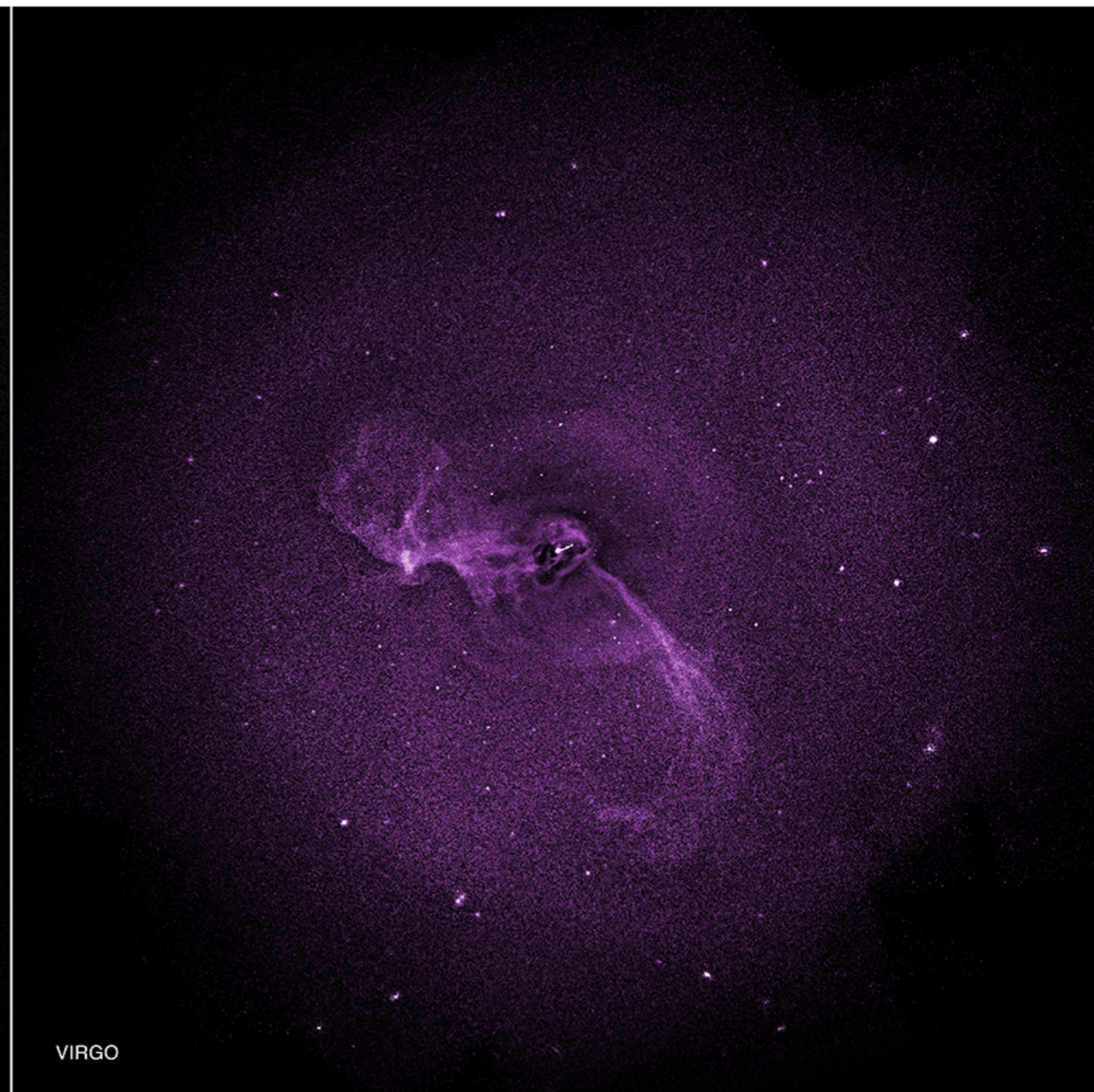
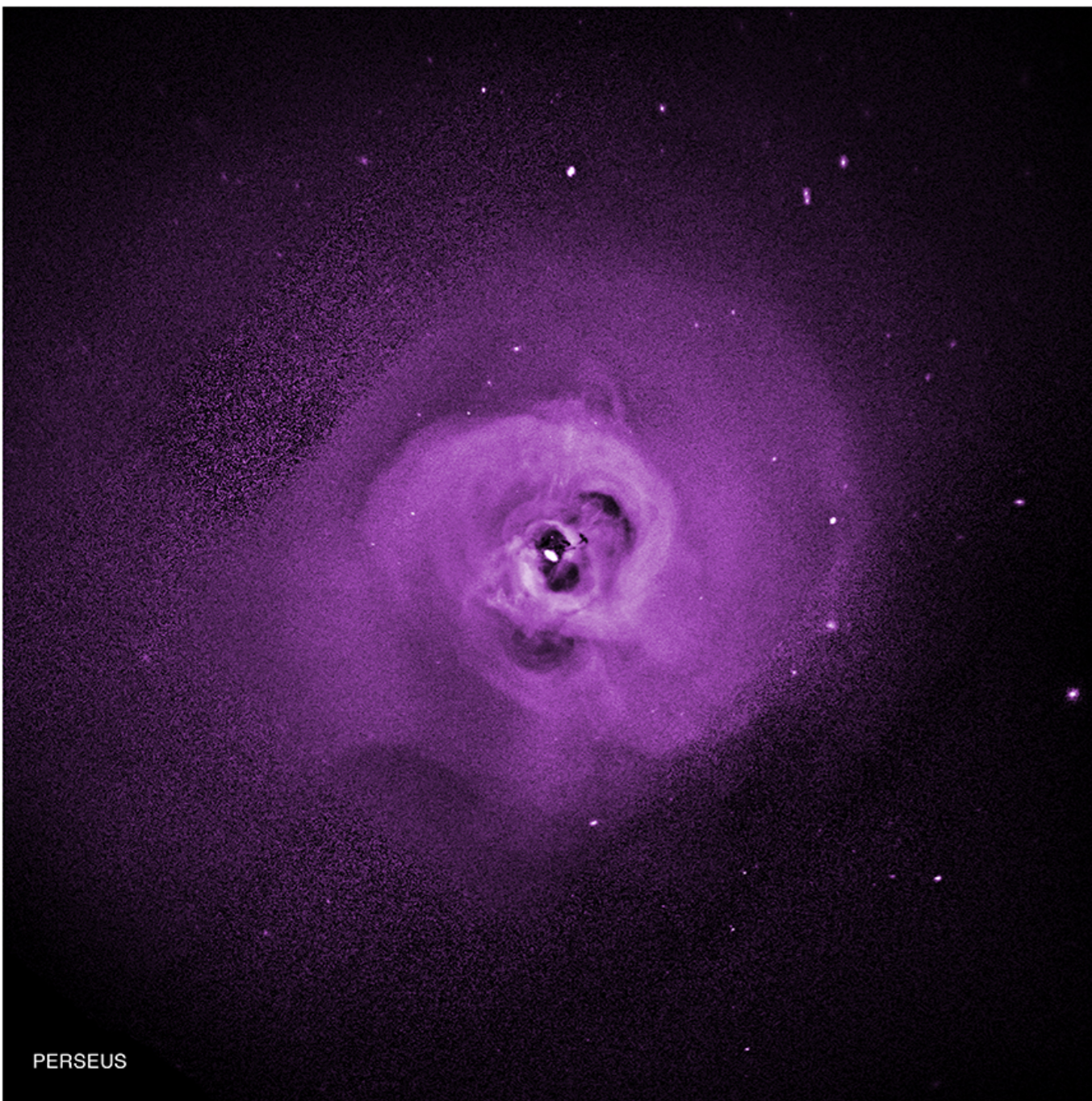
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**How do I know if my
source is extended?**

srcextent

optional, use “”

event list or image

event list or image

srcextent srcfile=“...” outfile=“...” psffile=“...” regfile=“...”

output file

region file

*stores the parameters
used/assumed and
the results of the tool
(also displayed to the
screen)*

*centered on source
with a circular or
elliptical region*

Extended Sources

screen output from srcextent:

```
Source file, FITS image or FITS events list (acisf00635N004_evt2.fits):
PSF file, FITS image or FITS events list (optional) (psf.fits):
Region File, ellipse or circle, in FITS or ASCII (required for events list) (src.reg):
Output file, FITS table (extent.fits):
Results for Source 1
```

```
Source Observed Size: 1.10 " @ PA 16.62 deg at pixel coords 3531.8, 3782.3
90% Confidence intervals: (1.04 -- 1.17) @ (INDEF -- INDEF)
```

source size

```
PSF Observed Size: 1.22 " @ PA 11.00 deg at pixel coords 3531.1, 3781.0
90% Confidence intervals: (1.20 -- 1.24) @ (INDEF -- INDEF)
```

psf size

```
Estimated Intrinsic Size: 0.00 " @ PA 0.00 deg
90% Confidence intervals: (INDEF -- INDEF) @ (INDEF -- INDEF)
```

```
Source is not extended at 90% confidence
```

**Estimate from srcextent of the source extent.
This output is only provided if you give a psf file.**

<http://cxc.harvard.edu/ciao/threads/srcextent/>

Extended Sources

**Read more about
srcextent at this thread!**

**How do I make nice images of my
extended emission?**

aconvolve etc.

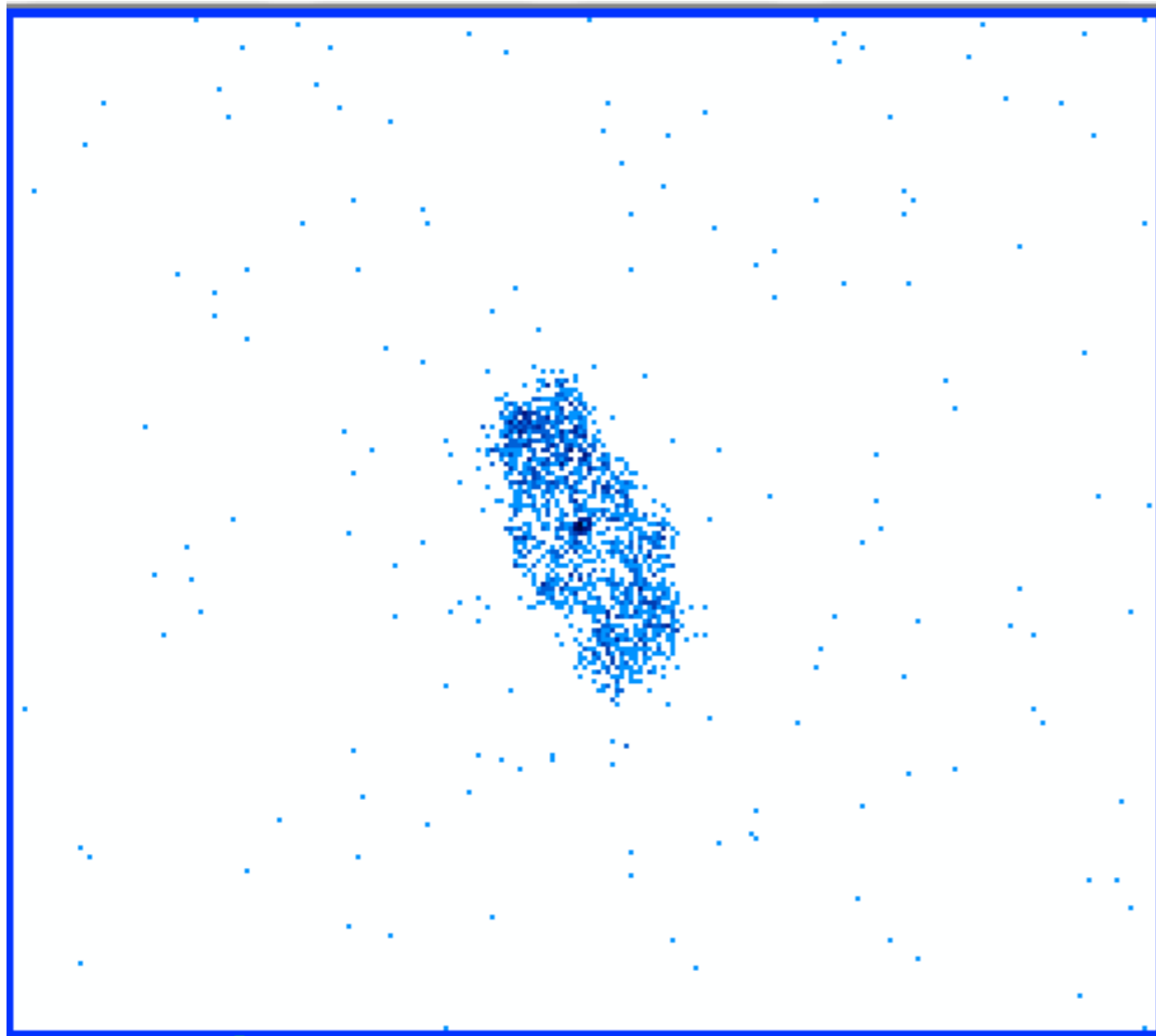
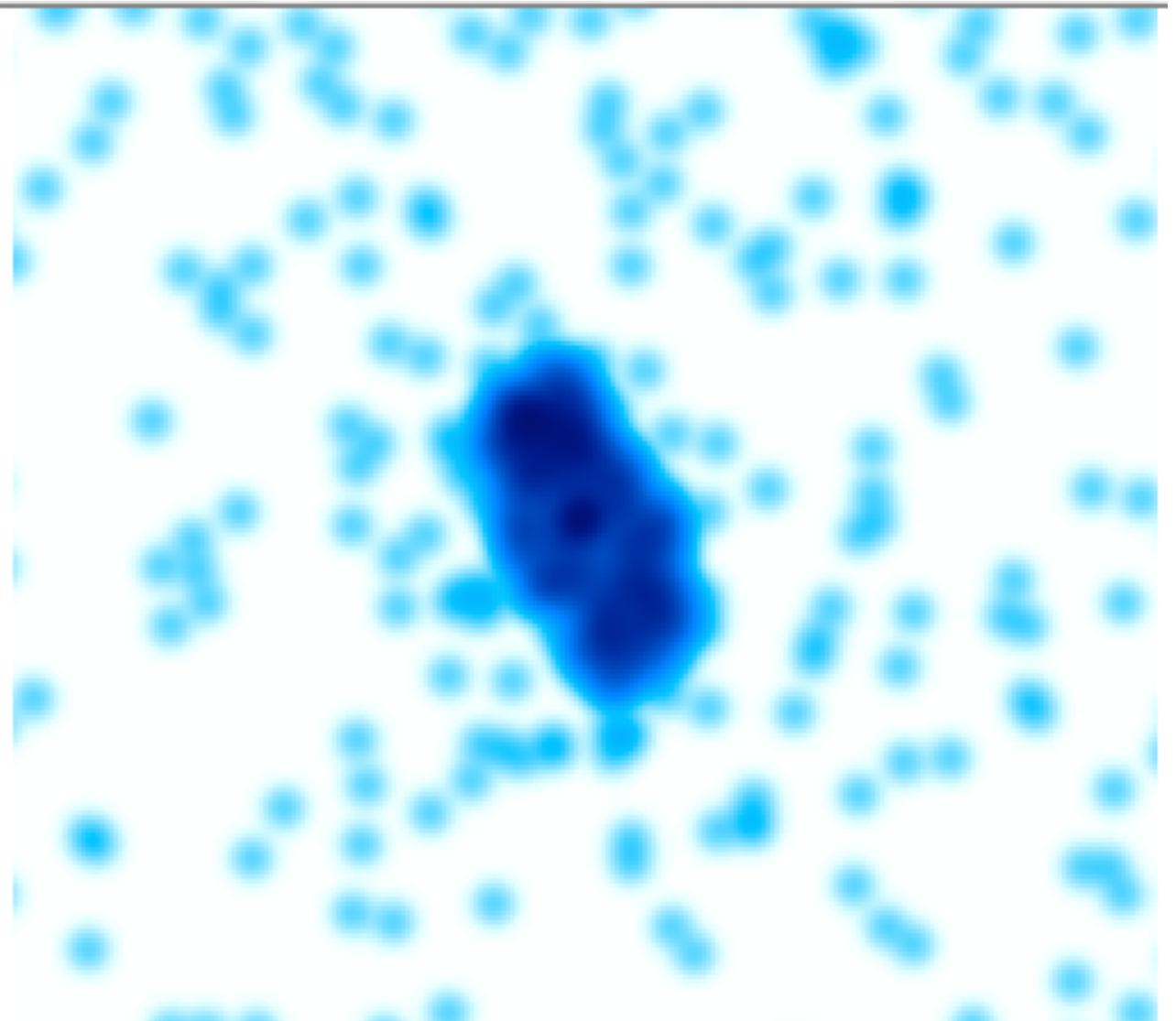
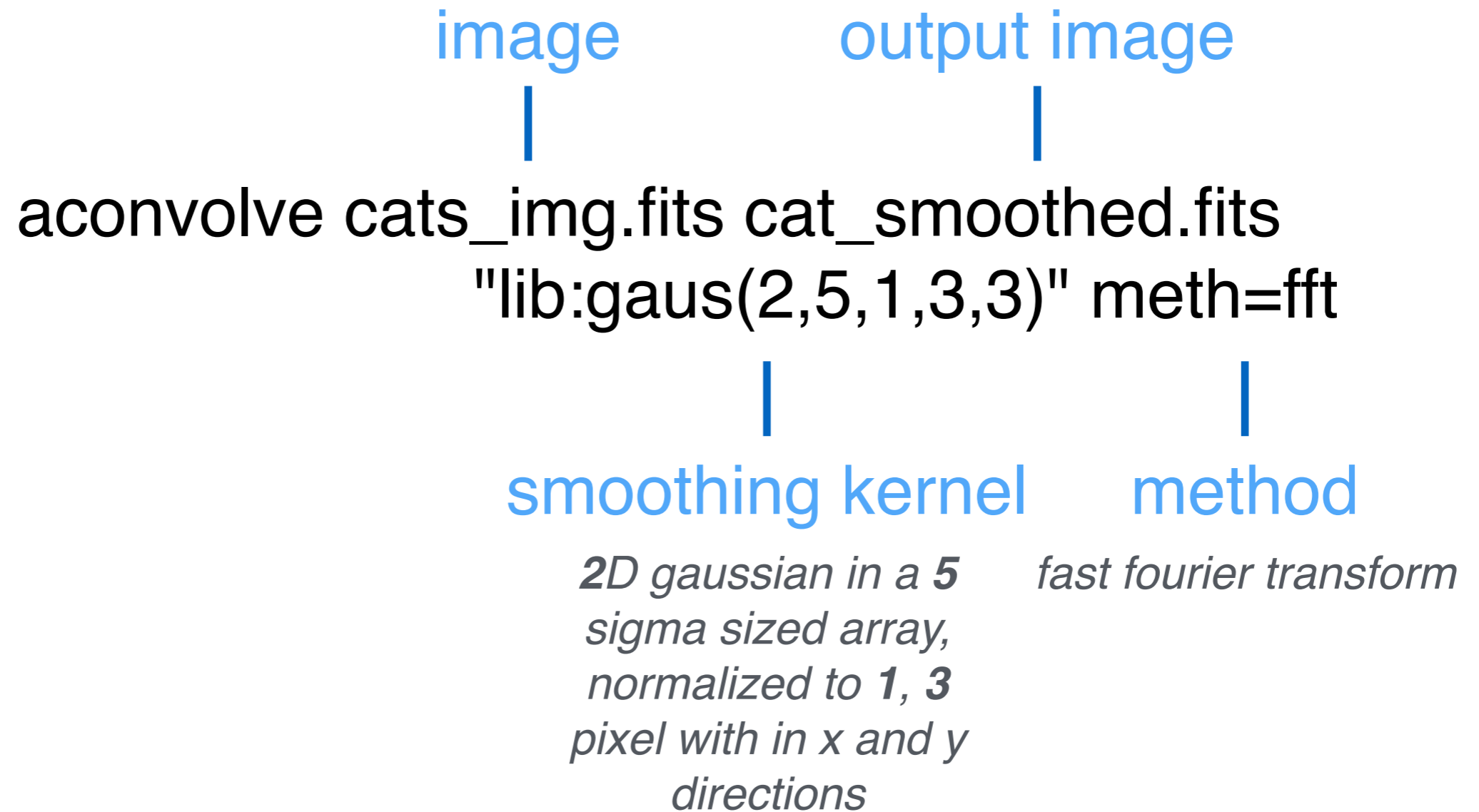


Image made w/ dmcopy ([bin x=::0.5,y=::0.5]
[energy=120:1200]; see X-ray Imaging slides)

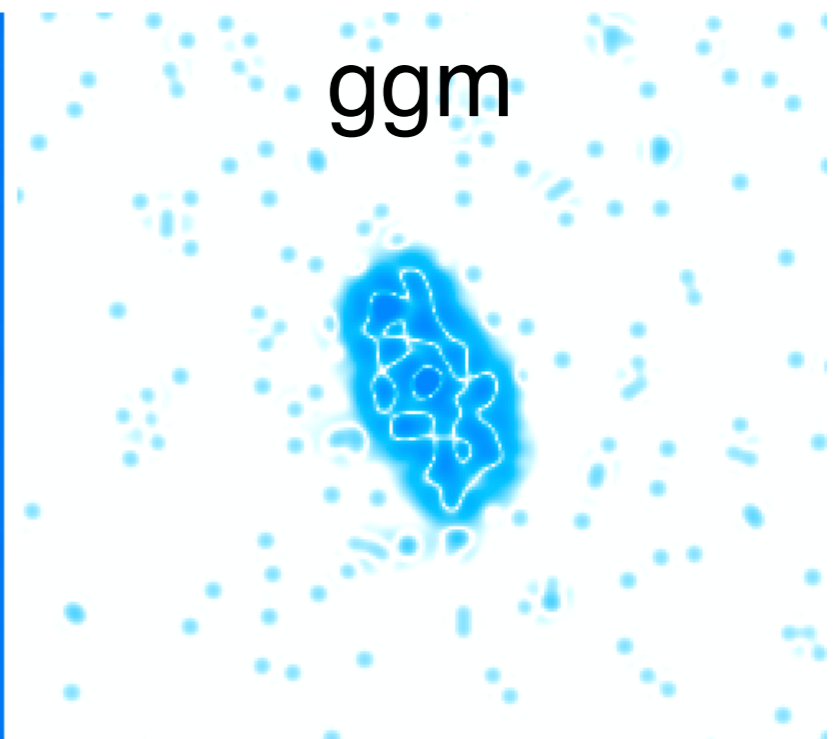
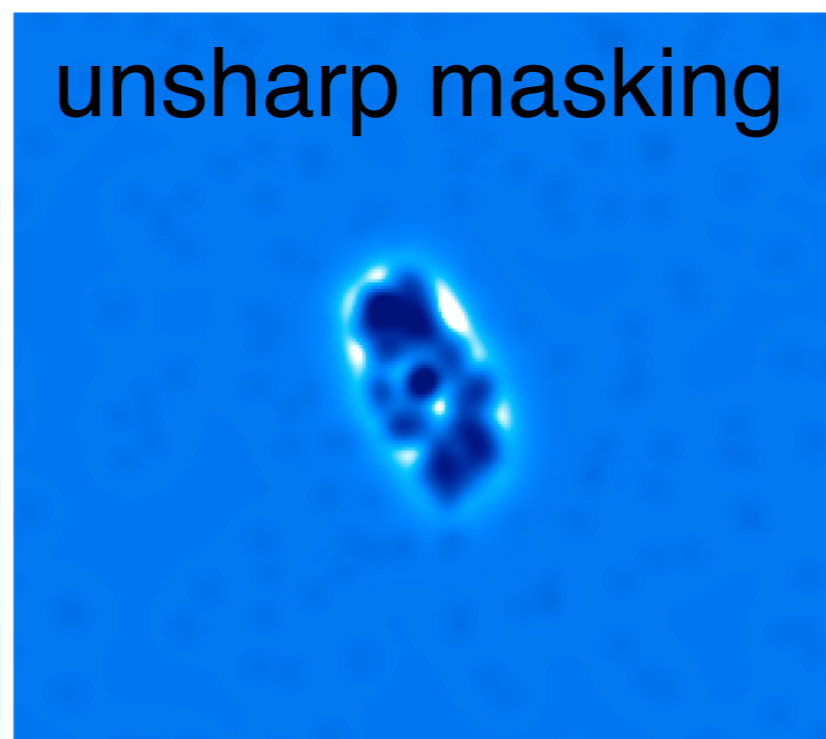
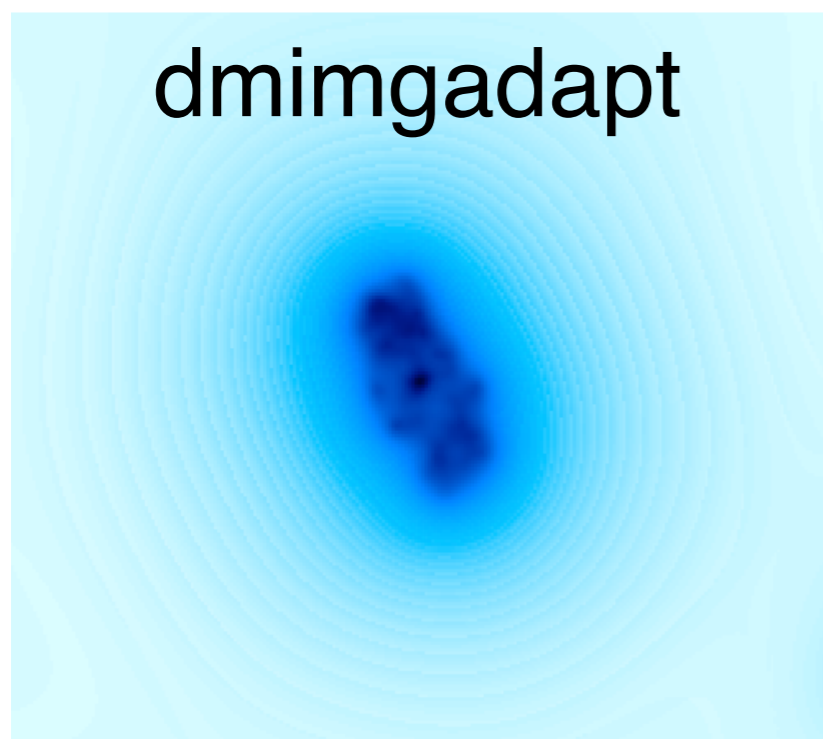
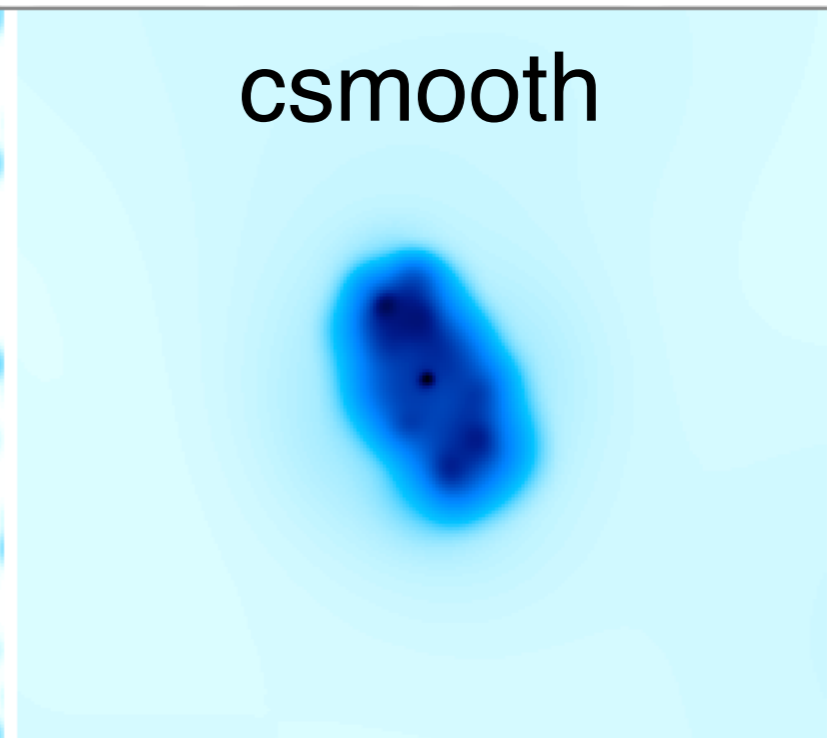
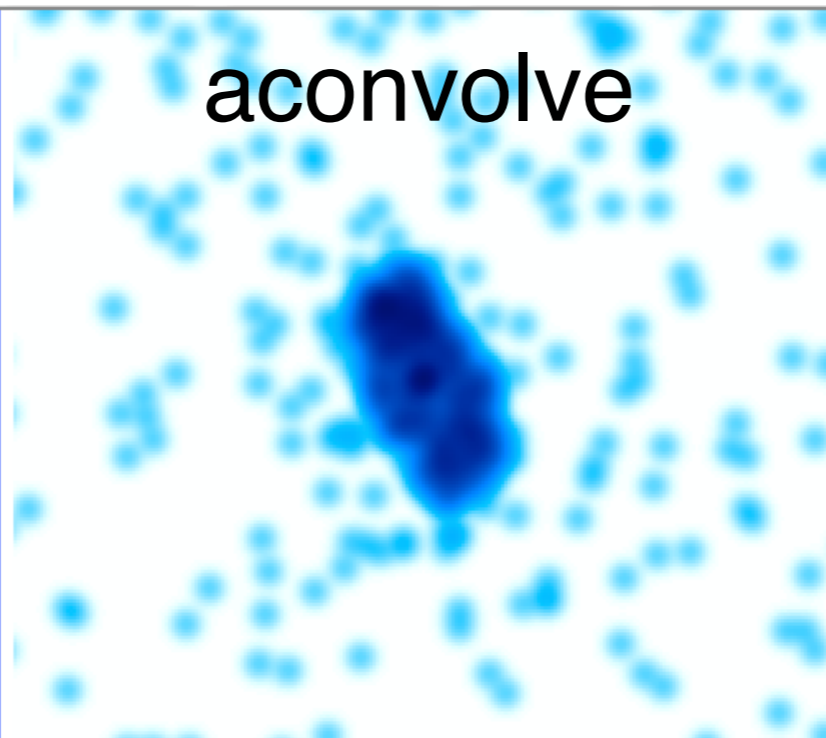
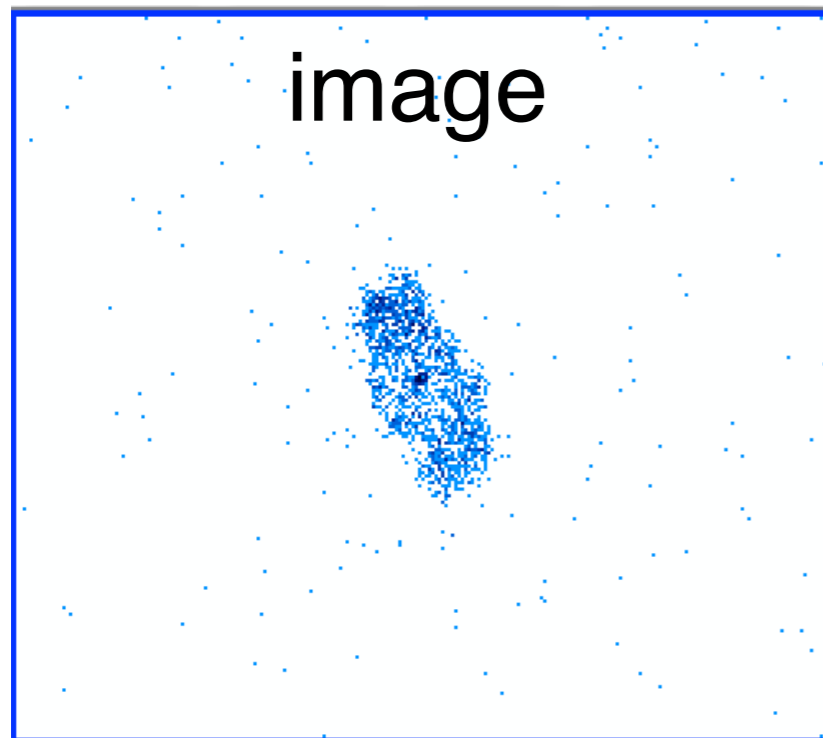


Smoothed image made with aconvolve using
a gaussian kernel with a fwhm of 3 pixels

Smoothing Techniques



Smoothing Techniques



<http://cxc.harvard.edu/ciao/gallery/smooth.html>

Smoothing Techniques

Read more about these
techniques at gallery!

Radial Profiles

in DS9 and Sherpa

File Edit Color Width Property Font Method Analysis

Parameters

Number 9

Text

Center 17:58:33.416 +66:37:58.813 fk5

Major Minor

Outer 11.000 6.000 arcsec

Inner 0.000

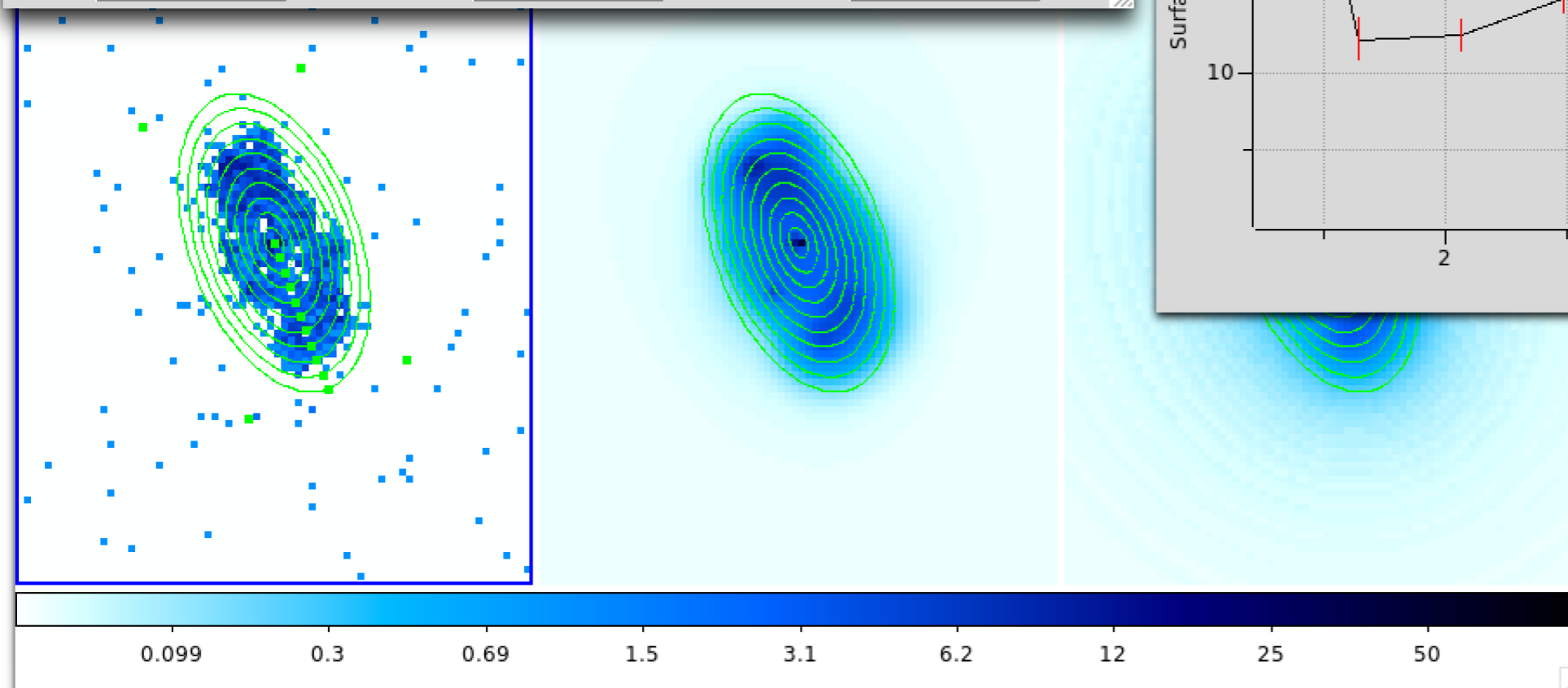
Annuli 10

Angle 290 Degrees

Apply Generate Close

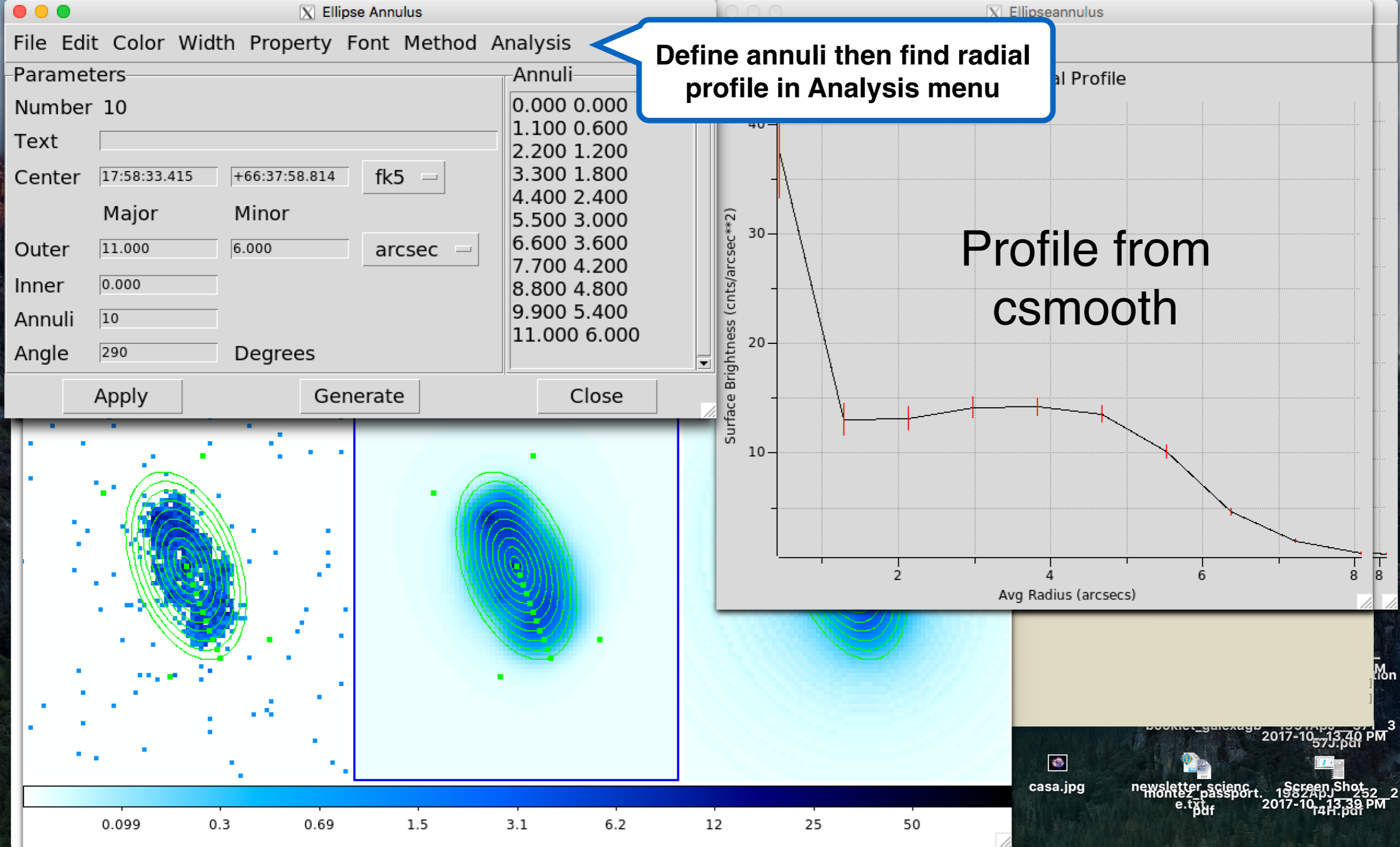
Annuli	
0.000	0.000
1.100	0.600
2.200	1.200
3.300	1.800
4.400	2.400
5.500	3.000
6.600	3.600
7.700	4.200
8.800	4.800
9.900	5.400
11.000	6.000

Define annuli then find radial profile in Analysis menu

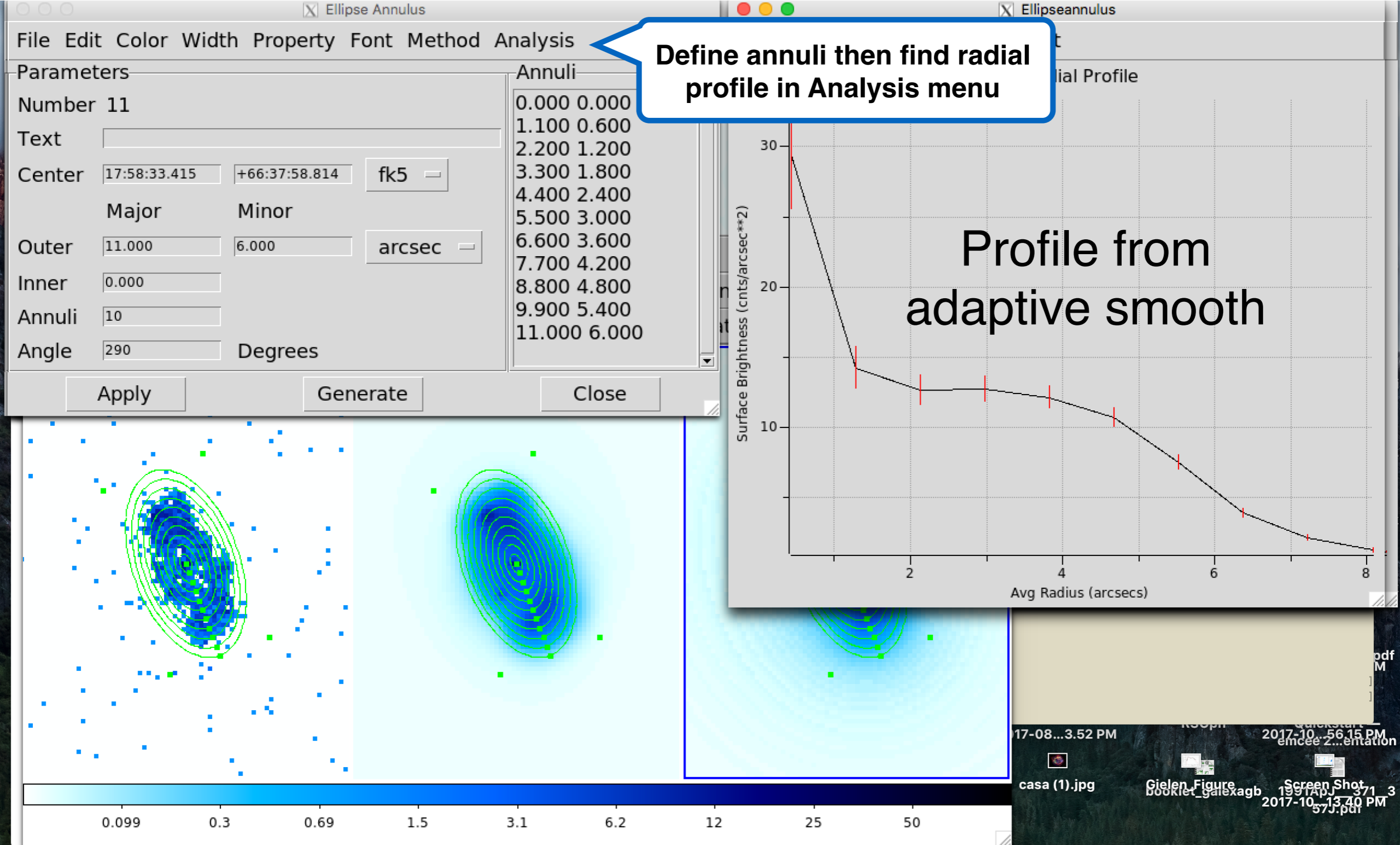


Profile from event list

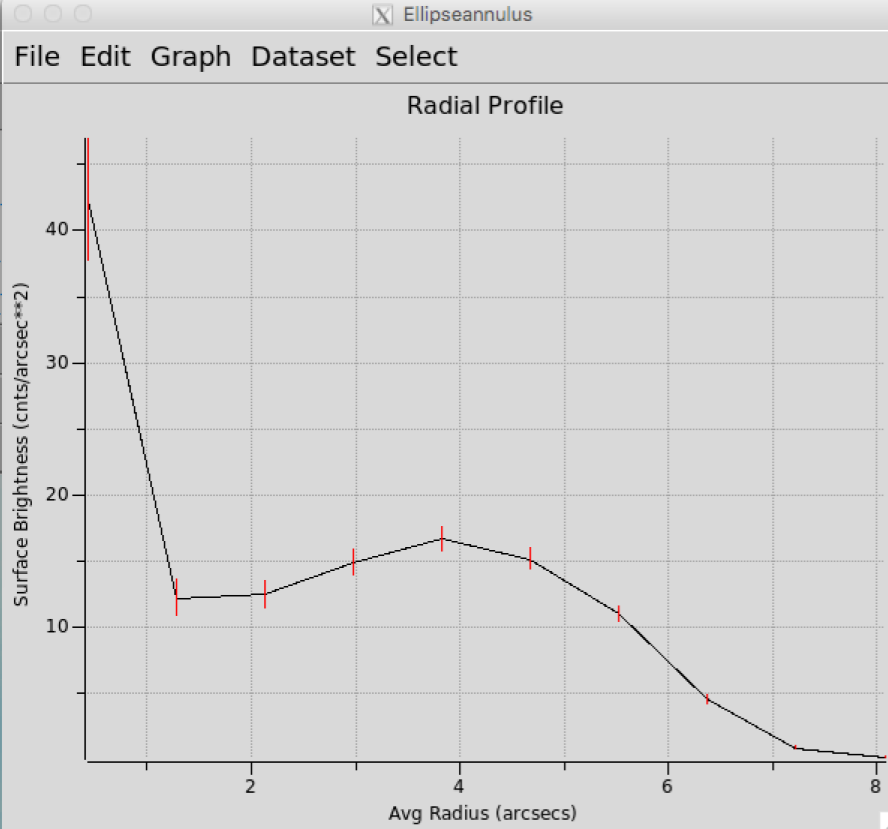
Radial Profiles in DS9



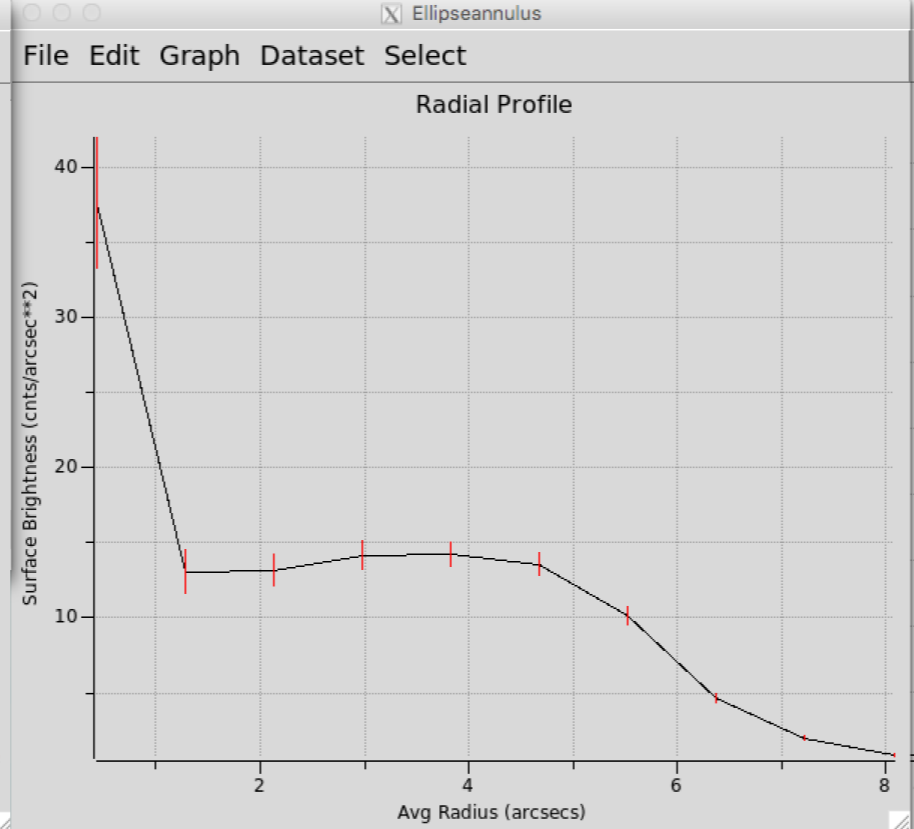
Radial Profiles



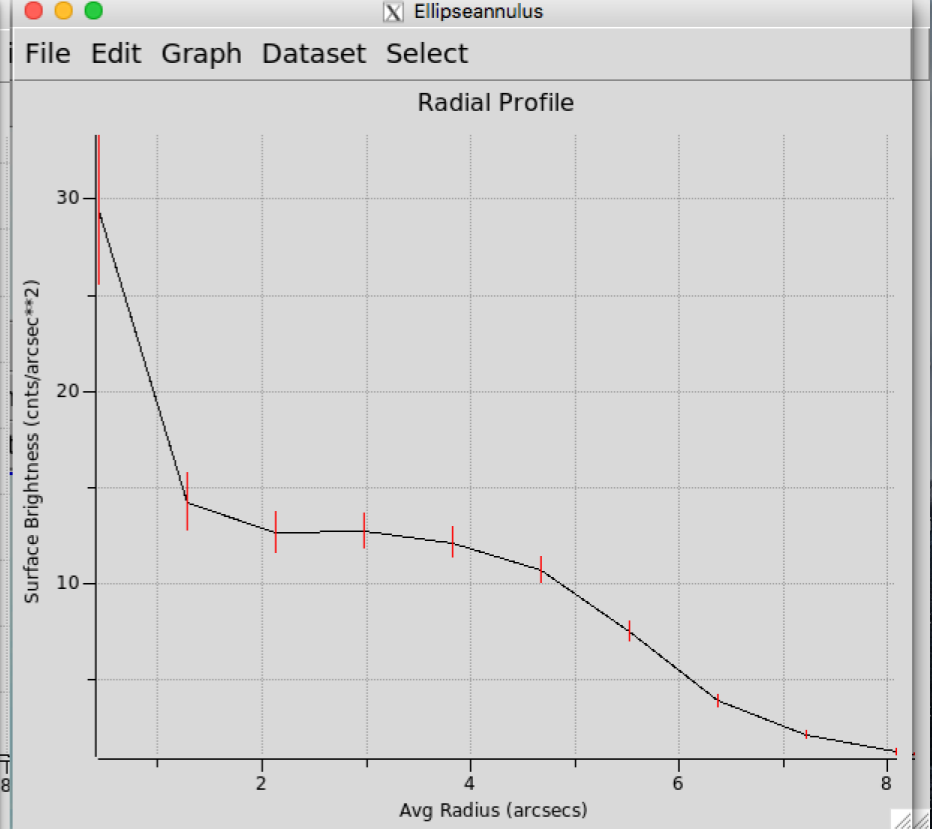
Radial Profiles



events

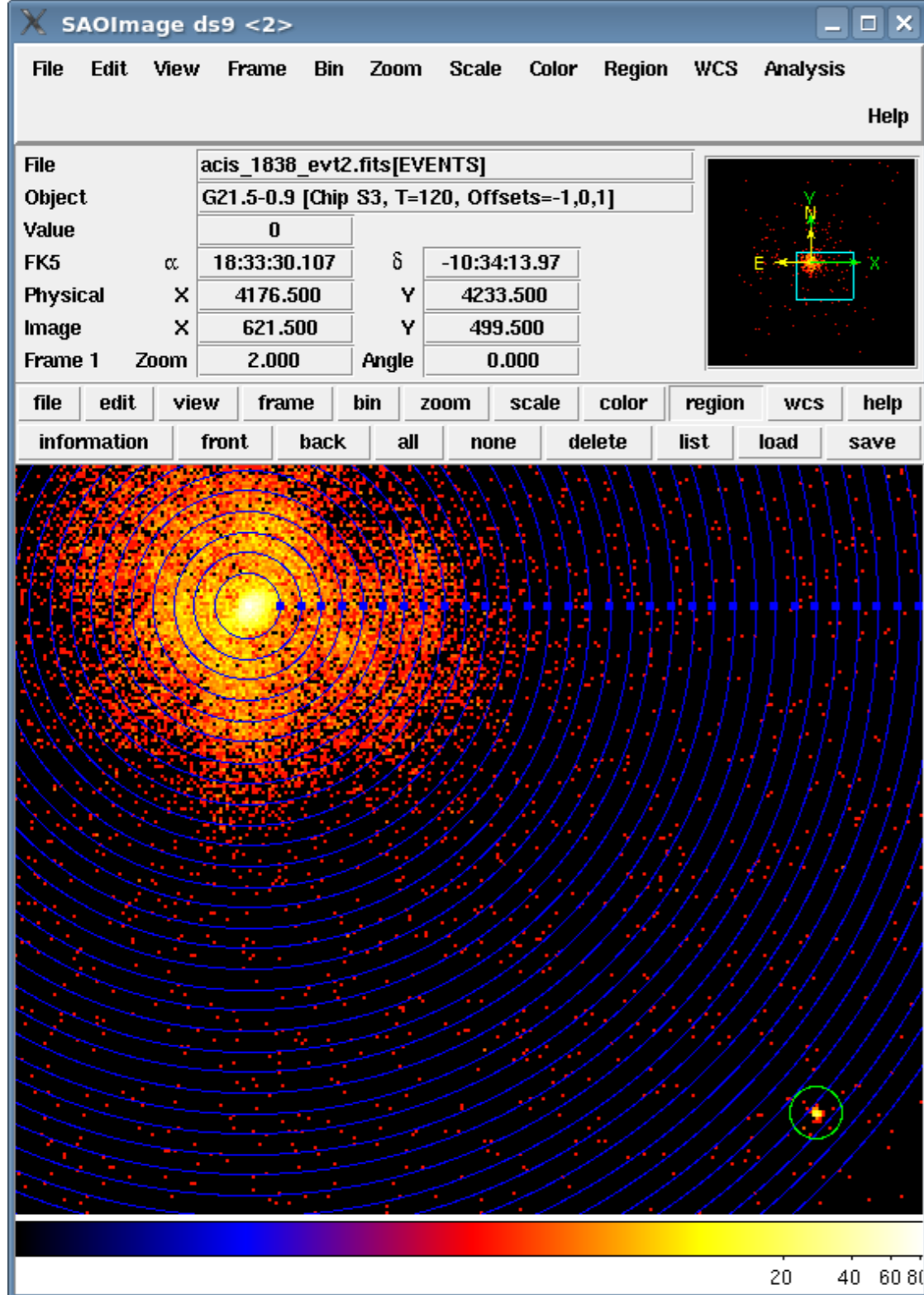


csmooth



dmimgadapt

Radial Profiles



Annulus

File Color Width Property Font Coordinate Radius Method

Number 1
 Text

Center 4072 4246 physical
 Inner Outer
 Radius 10 200 physical
 Annuli 38

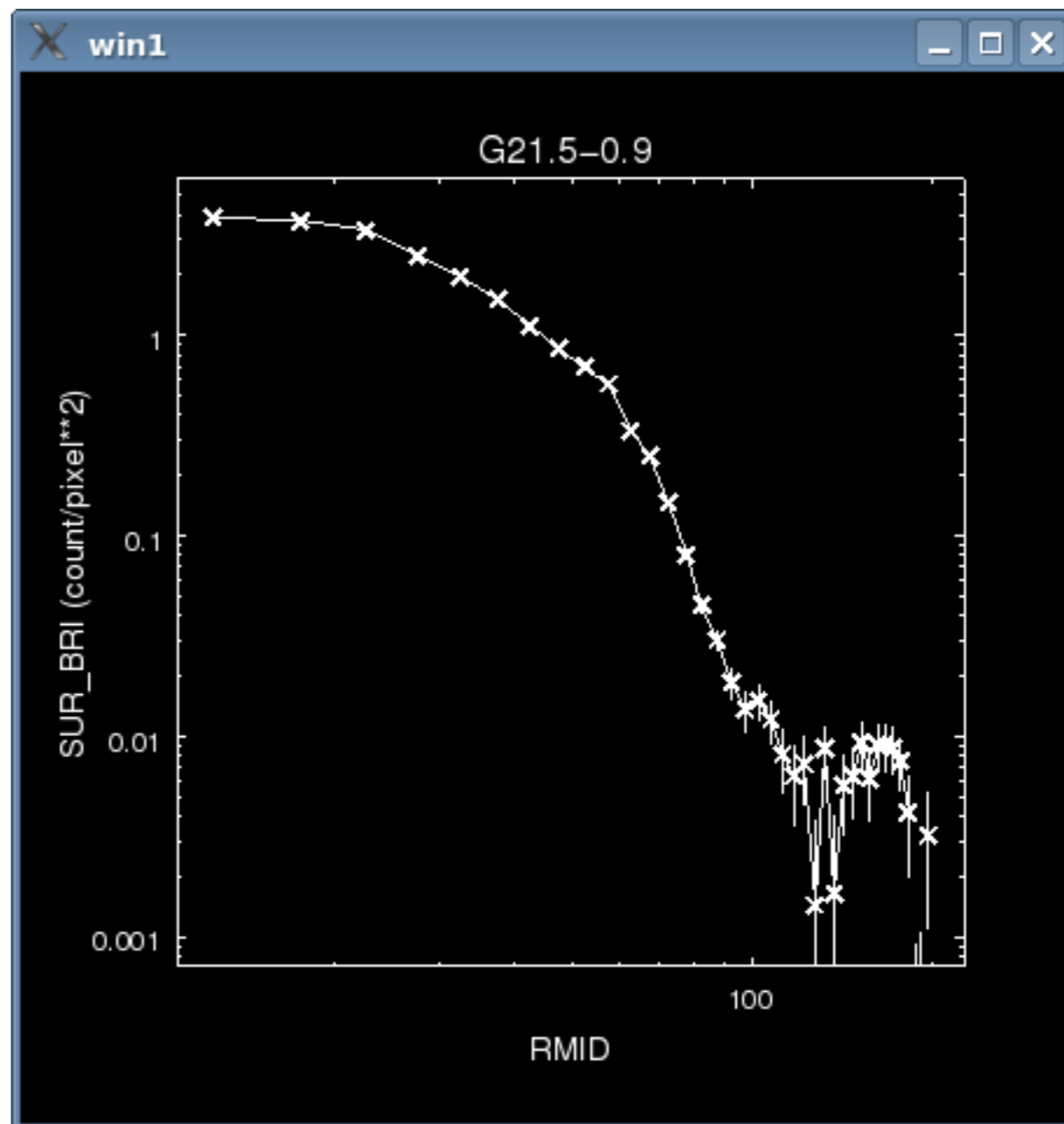
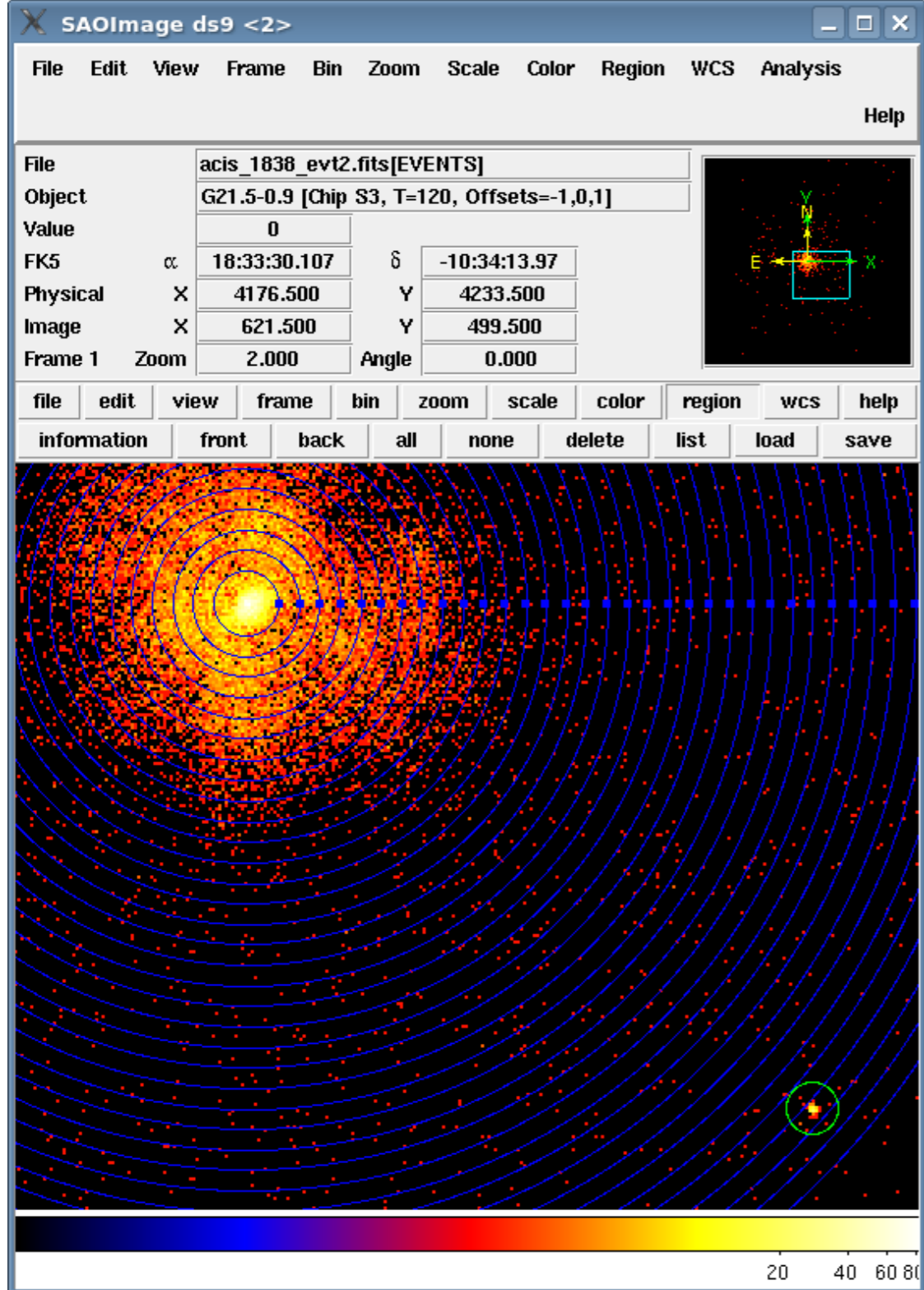
Radius physical
 10.0
 15.0
 20.0
 25.0
 30.0
 35.0
 40.0
 45.0
 50.0
 55.0

Apply Generate Close

http://cxc.harvard.edu/ciao/threads/radial_profile/

Radial Profiles

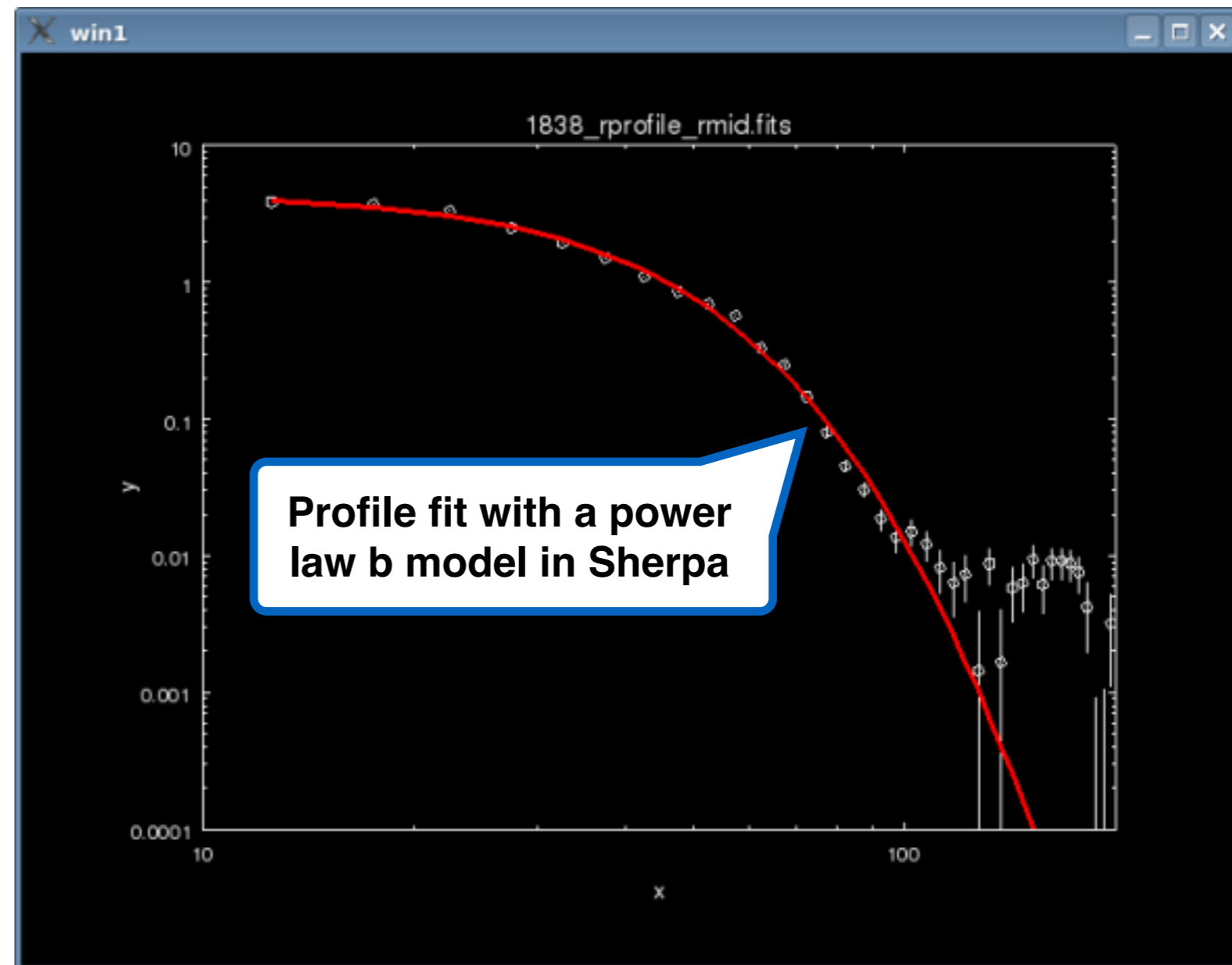
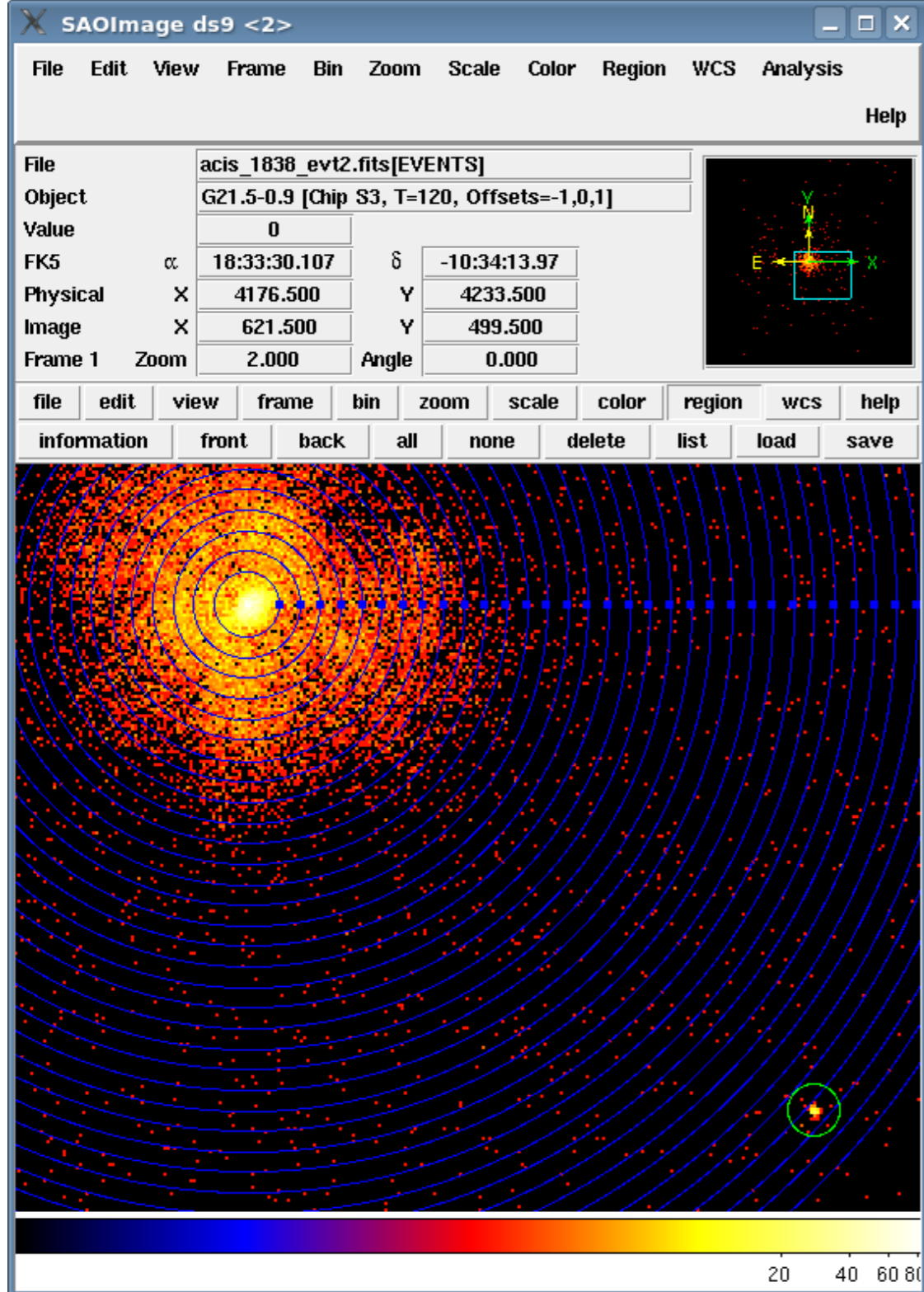
Read more about radial profile at this thread!



http://cxc.harvard.edu/ciao/threads/radial_profile/

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