

# G184.6-05.8

## 1 Summary

- Common Name: Crab
- Distance: 2 kpc (??)
- Position of Central Source (J2000): ( 05 34 30.9, 22 00 56.6 )
- X-ray size: 2.3' x 2.1'
- Description:

### 1.1 Summary of Chandra Observations

Sequence	Obs ID	Instrument	Exposure <sub>uf</sub> (ks)	Exposure <sub>f</sub> (ks)	Date Observed	Aimpoint (J2000) ( $\alpha$ , $\delta$ )
500171	1994	ACIS-7	4.2	4.2	2000-11-03	( 05 34 31.6, 22 00 56.4 )
500173	1996	ACIS-7	4.5	4.5	2000-11-25	( 05 34 31.6, 22 00 56.4 )
500175	1998	ACIS-7	4.2	4.2	2000-12-18	( 05 34 31.6, 22 00 56.4 )
500176	1999	ACIS-7	4.1	4.1	2001-01-09	( 05 34 31.6, 22 00 56.4 )

Exposure<sub>uf</sub> → Exposure time of un-filtered event file

Exposure<sub>f</sub> → Exposure time of filtered event file

- The remnant is covered by chip ACIS-S3(CCD\_ID=7).
- Due to usage of the subarray some part of the remnants are missing in some observation.
- These observation were done with NO aspect dithering.
- No background light curve filtering was done.
- It seems that the central source is strongly affected by pileup.

### 1.2 Chandra Counts and Fluxes

Region	Energy Range (keV)	Signal (counts)	Rate (counts s <sup>-1</sup> )	F <sub>x</sub> <sup>abs</sup> (ergs cm <sup>-2</sup> s <sup>-1</sup> )	F <sub>x</sub> (ergs cm <sup>-2</sup> s <sup>-1</sup> )	L <sub>x</sub> (ergs s <sup>-1</sup> )
Total	0.3 - 10.0	9.591e+06	2.131e+03	1.72e-08	2.88e-08	1.37e+37
( 1996 )	0.3 - 2.1	7.048e+06	1.566e+03	5.08e-09	1.62e-08	7.73e+36
	2.1 - 10.	2.570e+06	5.710e+02	1.22e-08	1.26e-08	6.01e+36

- N<sub>H</sub> = 0.40 (10<sup>22</sup> cm<sup>-2</sup>)
- Assumed distance: 2 kpc (??)
- nH was derived with power-law model

### 1.3 Nearby Sources

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Obs ID	Position (J2000)	Size	Net Count	Count rate	Note
1994					
1996					
1998					
1999					

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(note) 1. This nearby source list is incomplete.

All the above sources are originally from the "src2.fits" file  
which is distributed with standard chandra processing.

Only sources with significant count rate and which are clear to  
visual inspection are included.

2. The size given above is the size of the region used in detecting  
that source.

3. For each source, background was subtracted from annular region  
around the source.

### 1.4 References

- Bietenholz et al., 2001 ApJ, 560, 254 : VLA at 5 GHz band

## 2 Fit Detail

- See spectrum page for used regions.

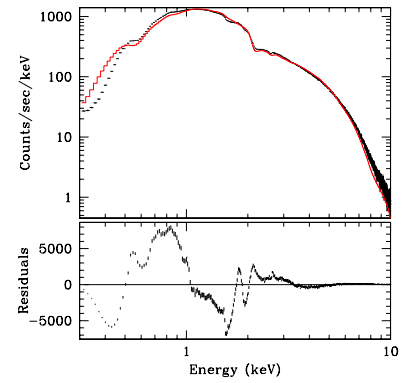
### 2.1 Total:

- simple power-law fit
- region : **Total**

source=(xswabs \* powlaw1d)

reduced  $\chi^2 = 118.804$

nh = 0.3947 10<sup>22</sup>/cm<sup>2</sup>

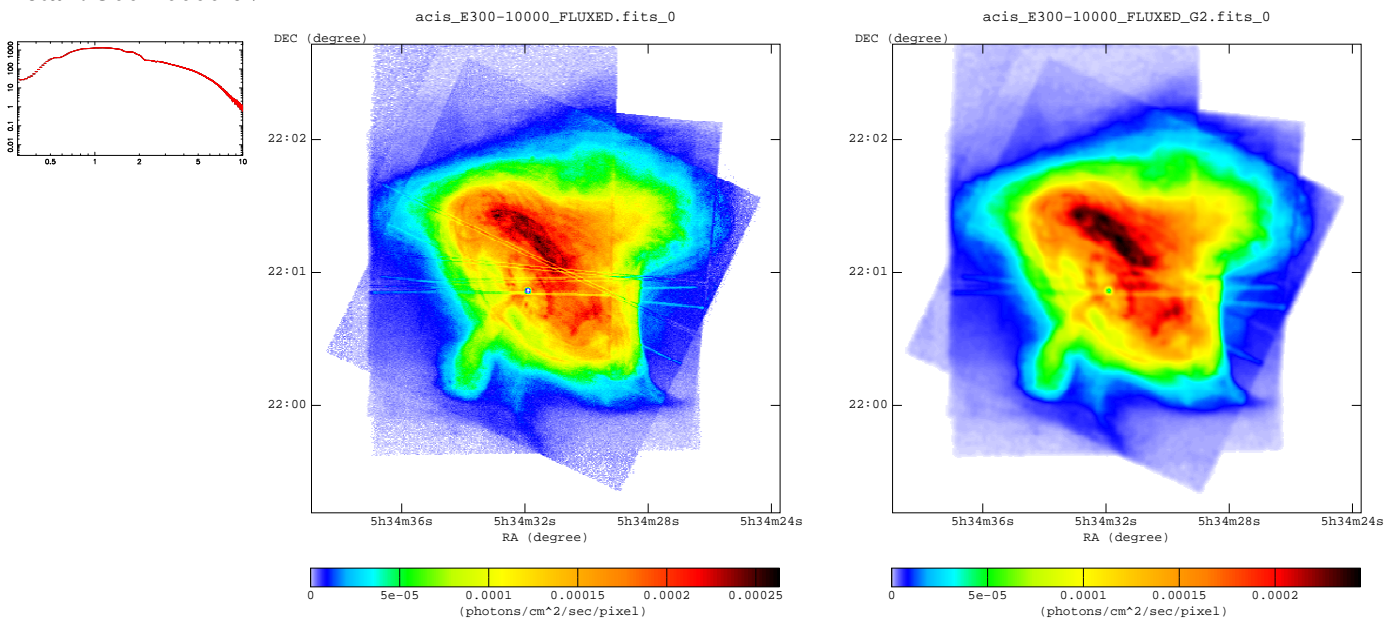


### 3 Chandra Images : Band Images

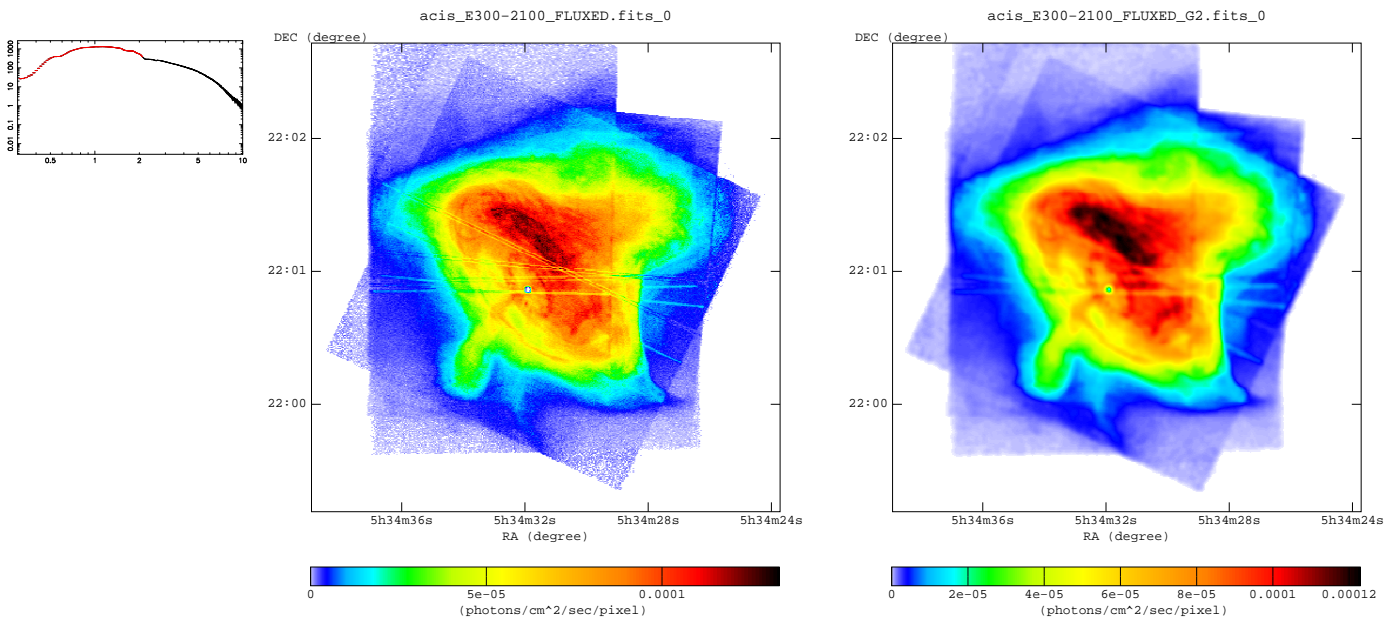
- Left : raw image, binned by 1x1 pixel
- Right : gaussian smoothed version of above ( $\sigma = 2$  pixel)

#### 3.1 Wide Band Images

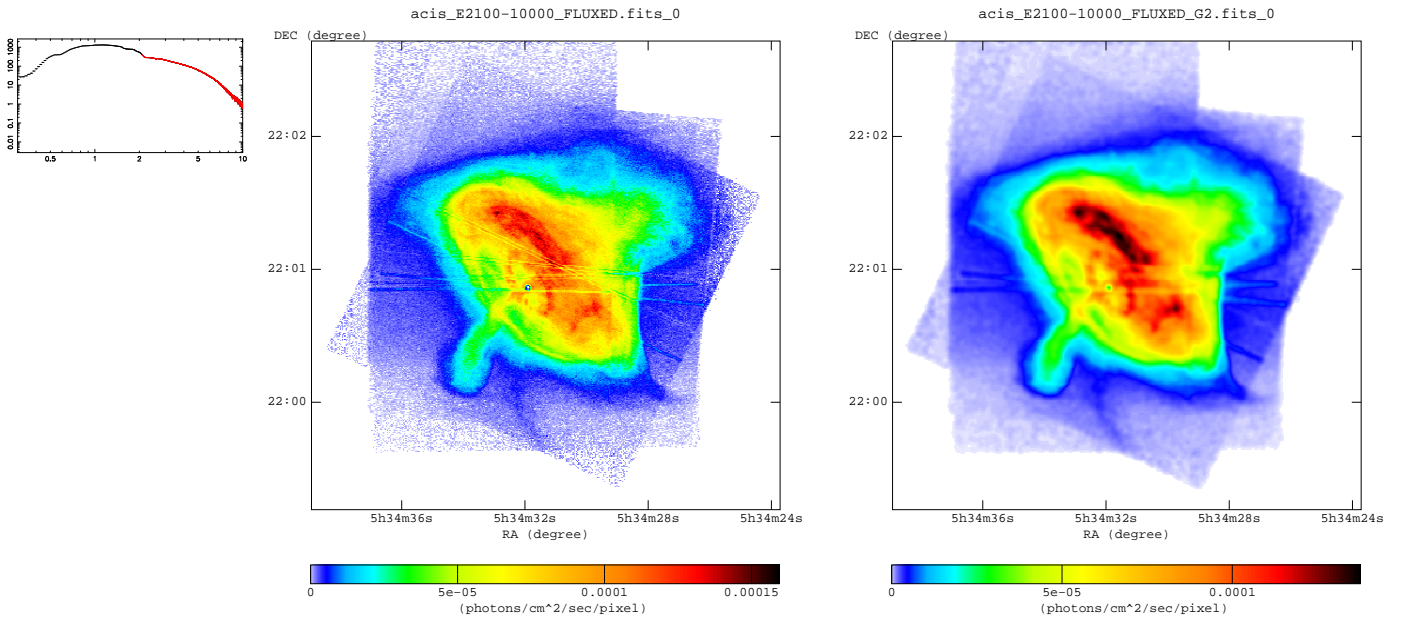
Total : 300-10000 eV



Soft Band : 300-2100 eV

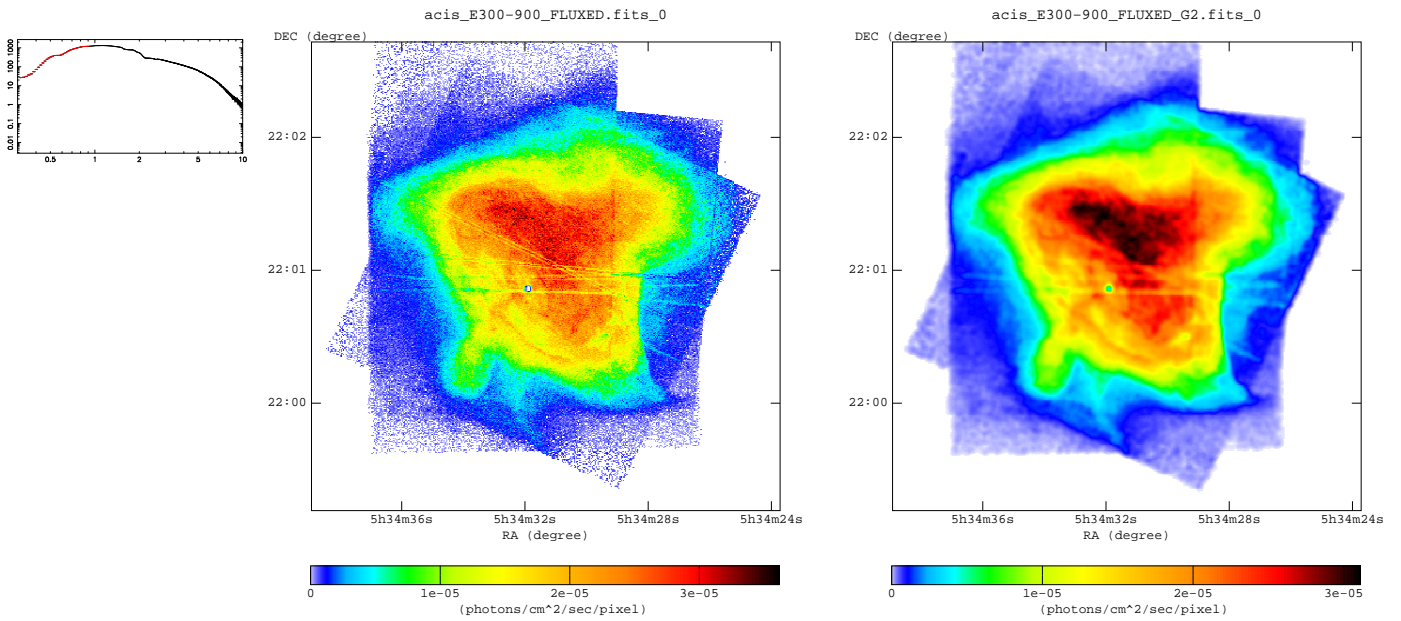


**Hard Band : 2100-10000 eV**

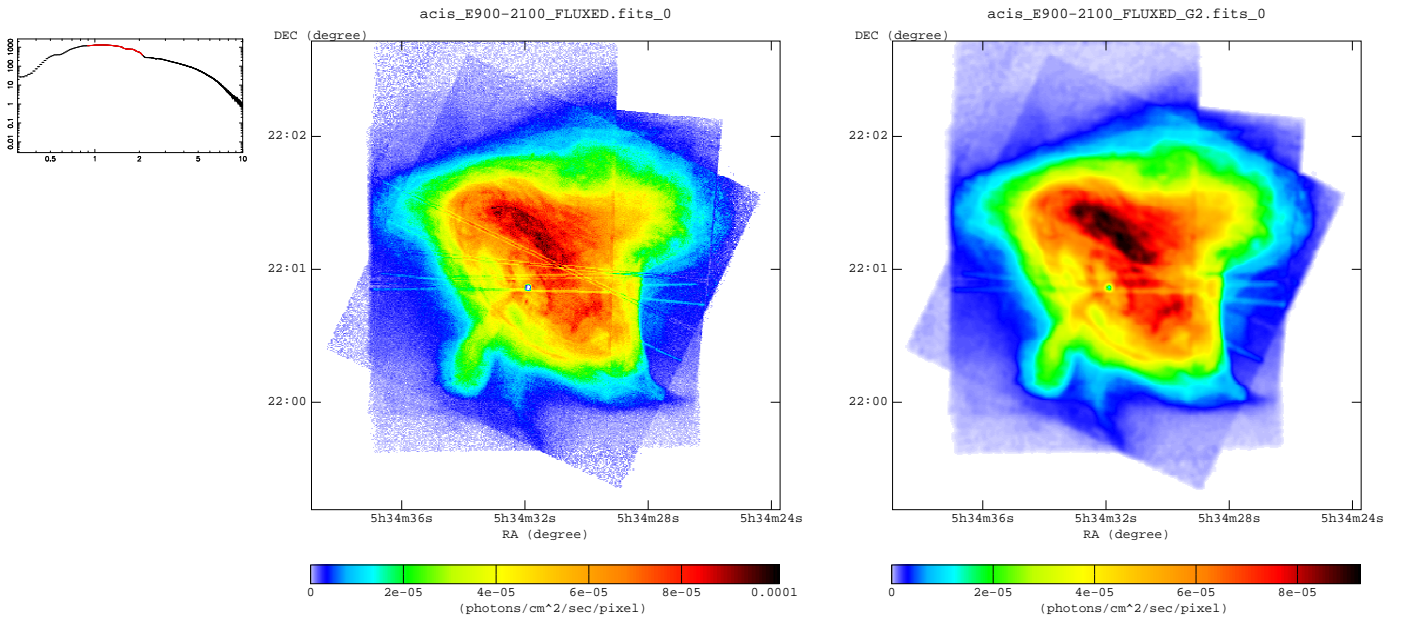


**3.2 Band images used in true color image.**

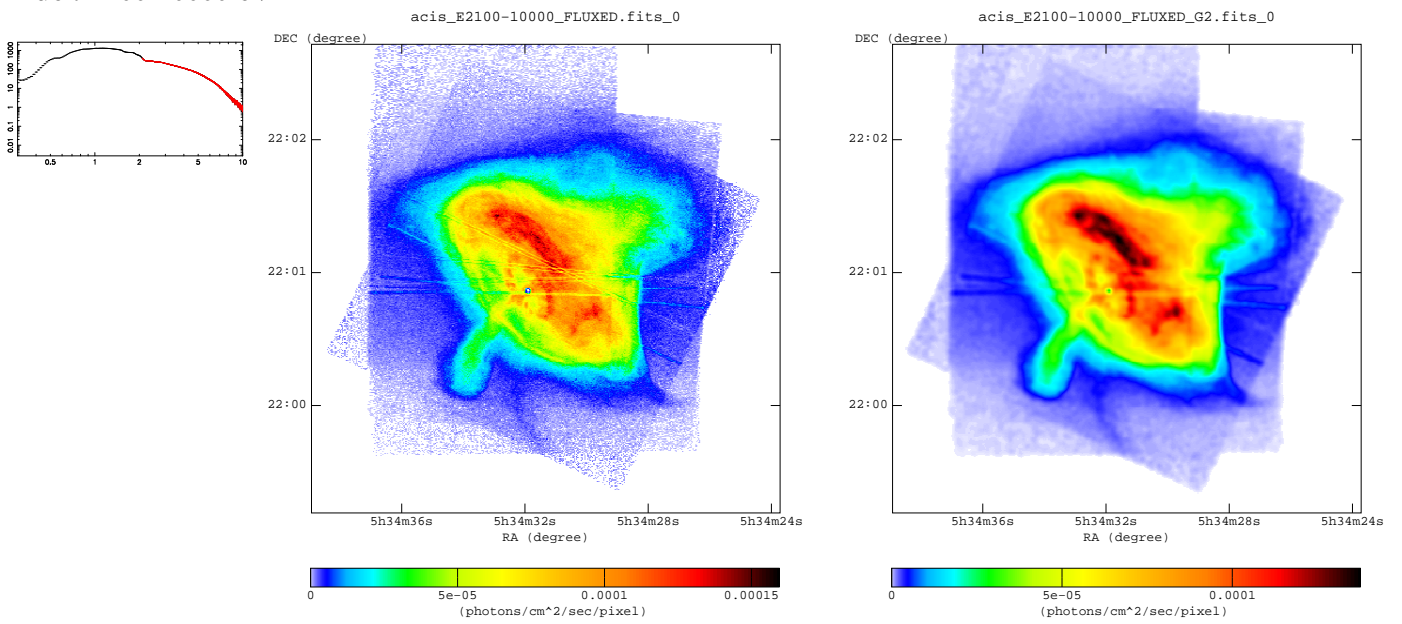
**Red : 300-900 eV**



**Green : 900-2100 eV**



**Blue : 2100-10000 eV**

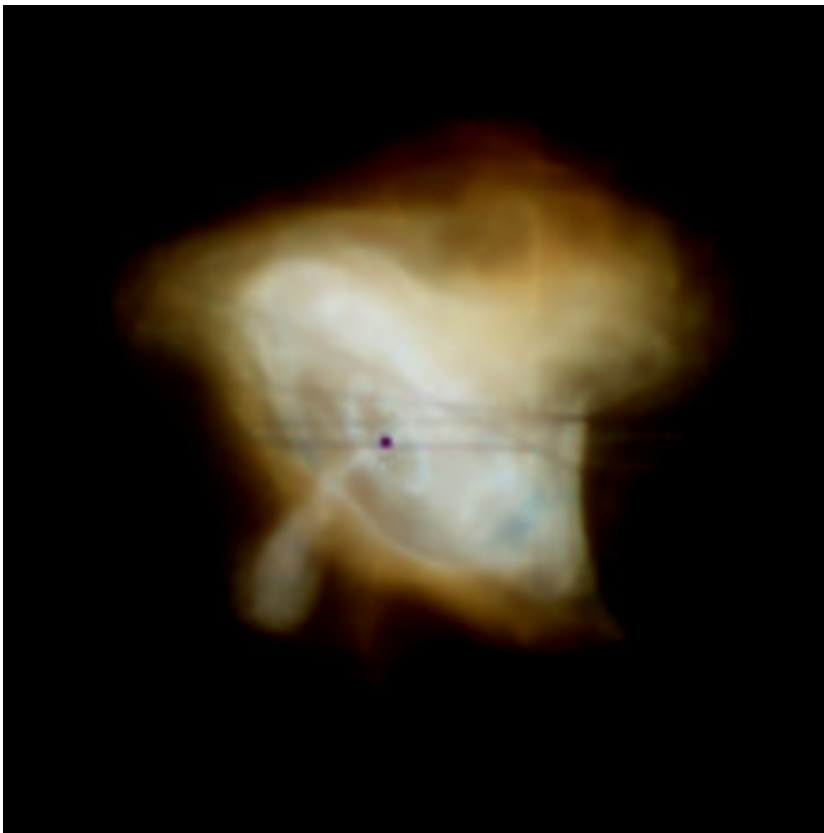
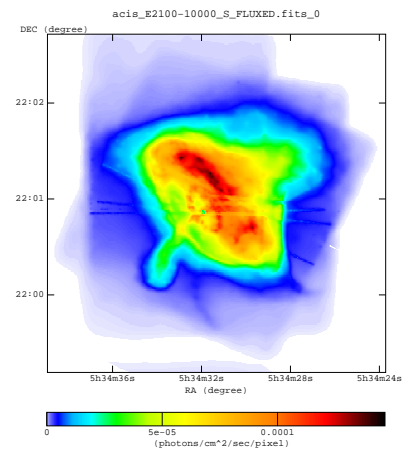
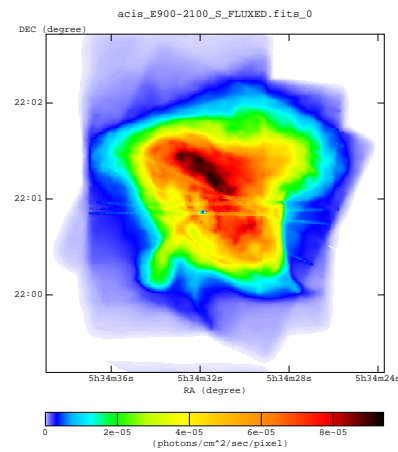
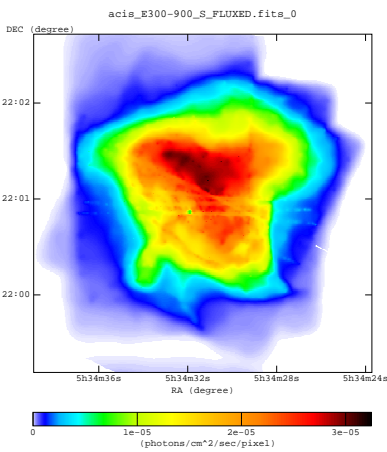
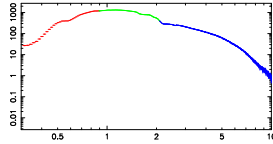


**3.3 Misc.**

### 4 Chandra Images : True Color

- Individual images are adaptively smoothed.
- Warning : the adaptive smoothing process sometimes produces artifacts.
- convolution method : fft
- kernel type : gauss
- significance ( min , max ) : ( 3 , 5 )

RED : 300-900 eV  
GREEN : 900-2100 eV  
BLUE : 2100-10000 eV



## 5 Chandra Spectrum

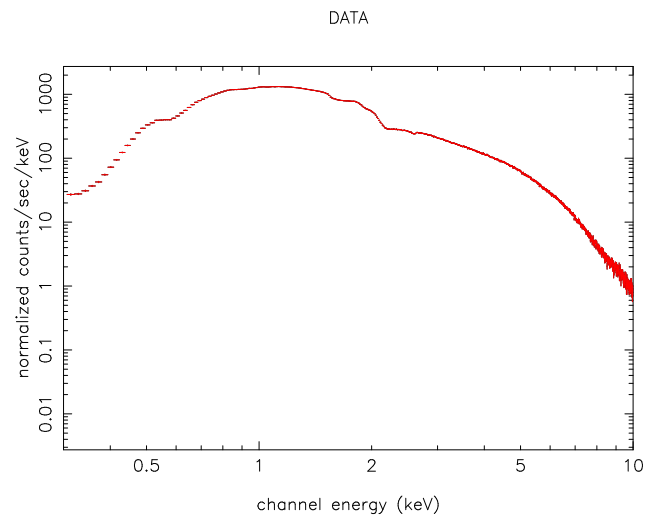
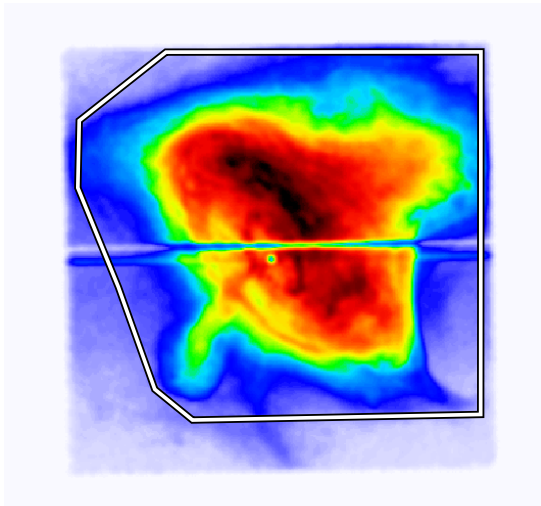
- Images show Regions used to extract spectra
- Regions with red strikes are excluded

### 5.1 ObsID 1994

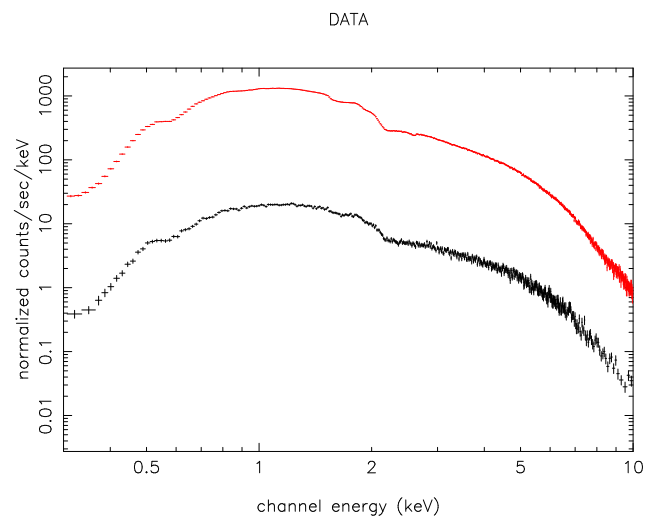
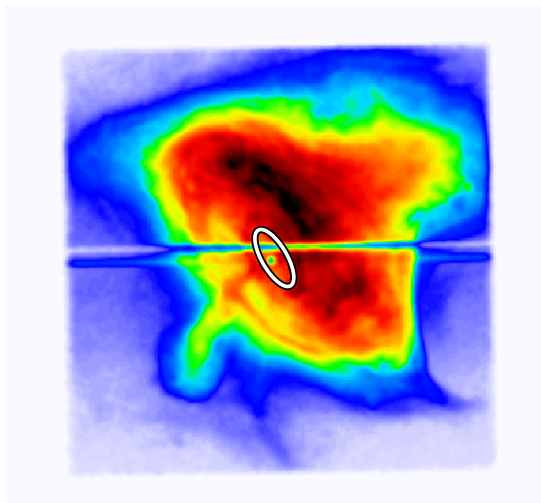
### 5.2 ObsID 1996

- Background was subtracted from the region around the SNR.

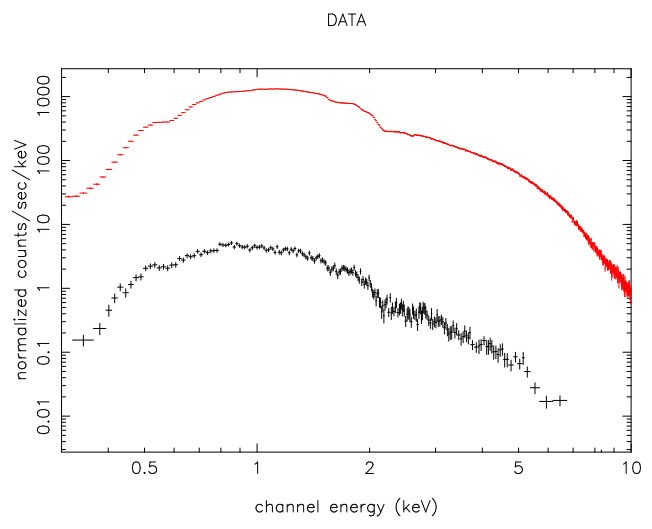
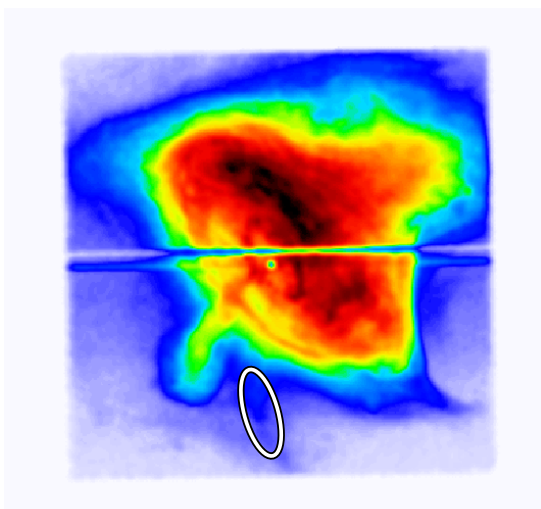
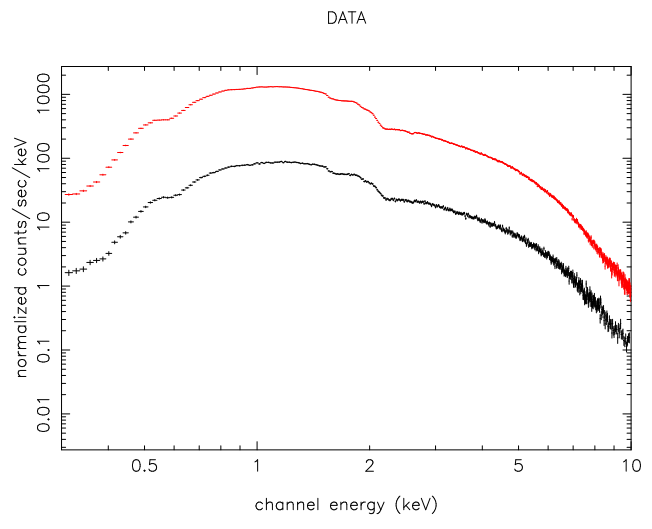
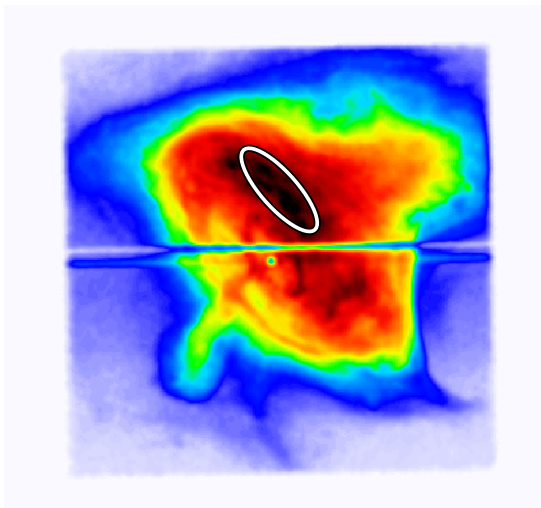
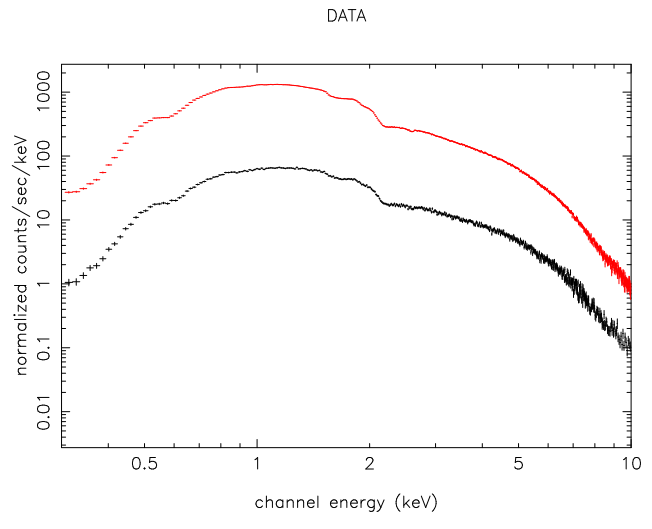
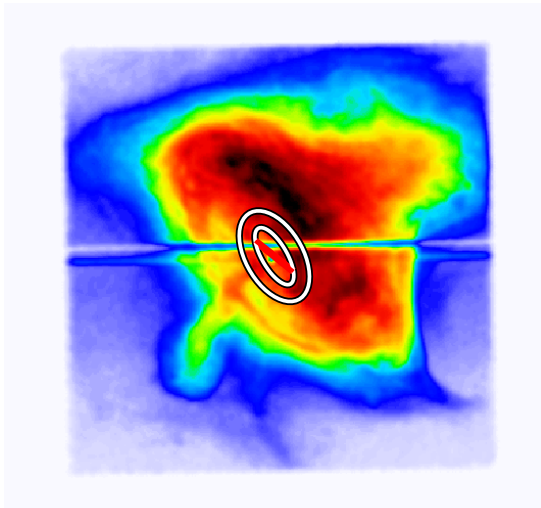
#### Total

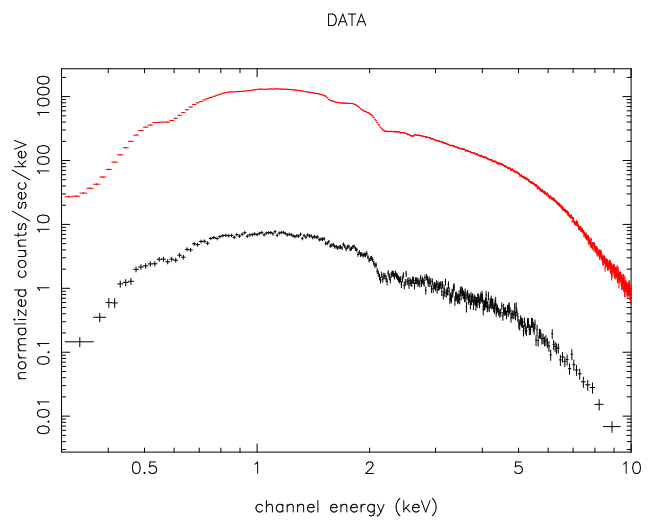
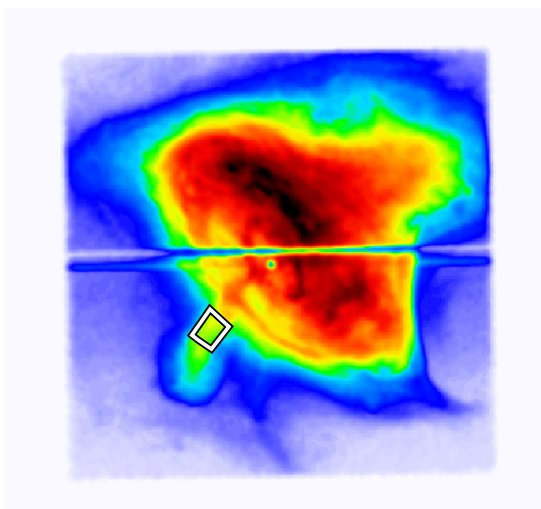
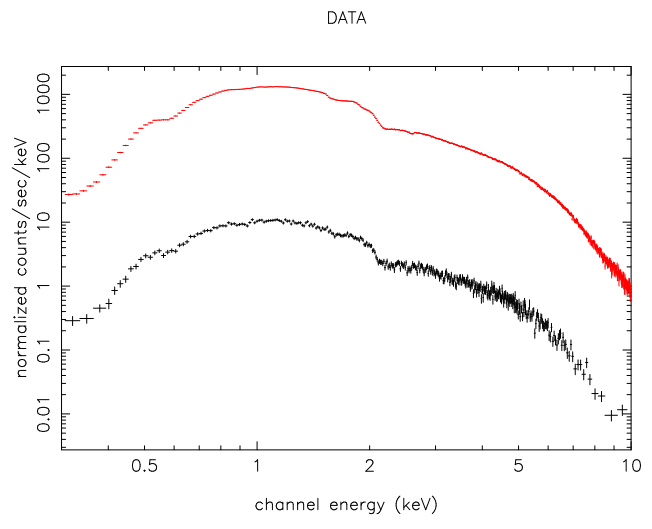
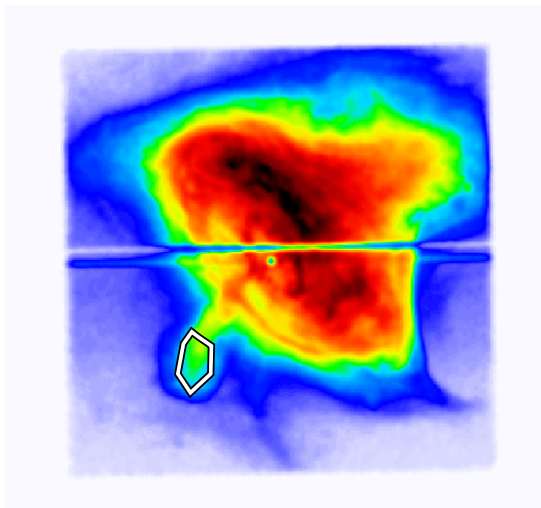
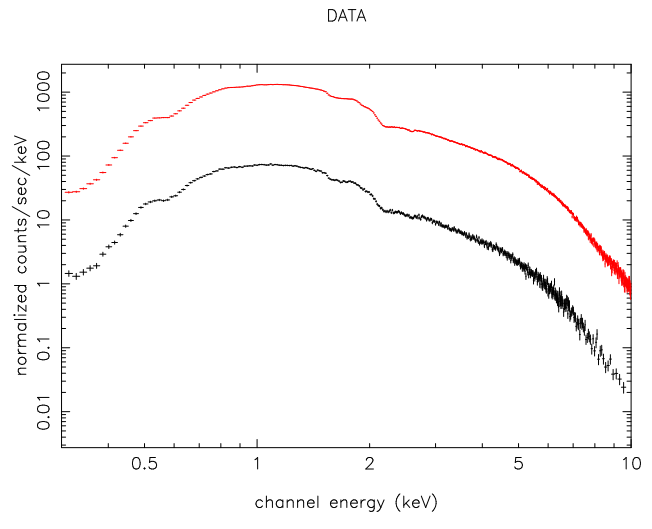
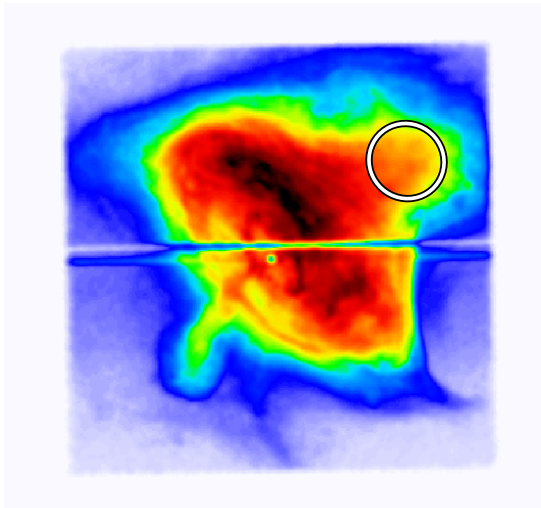


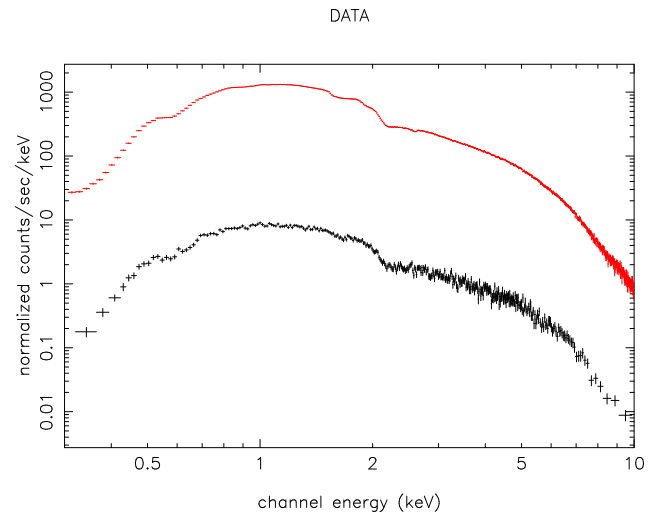
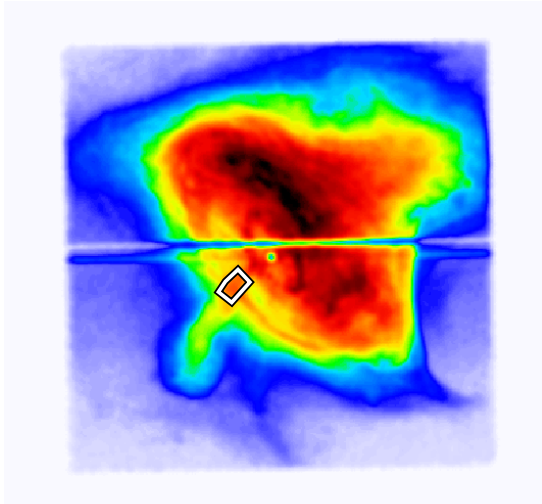
#### Central region (strong pile-up)











5.3 ObsID 1998

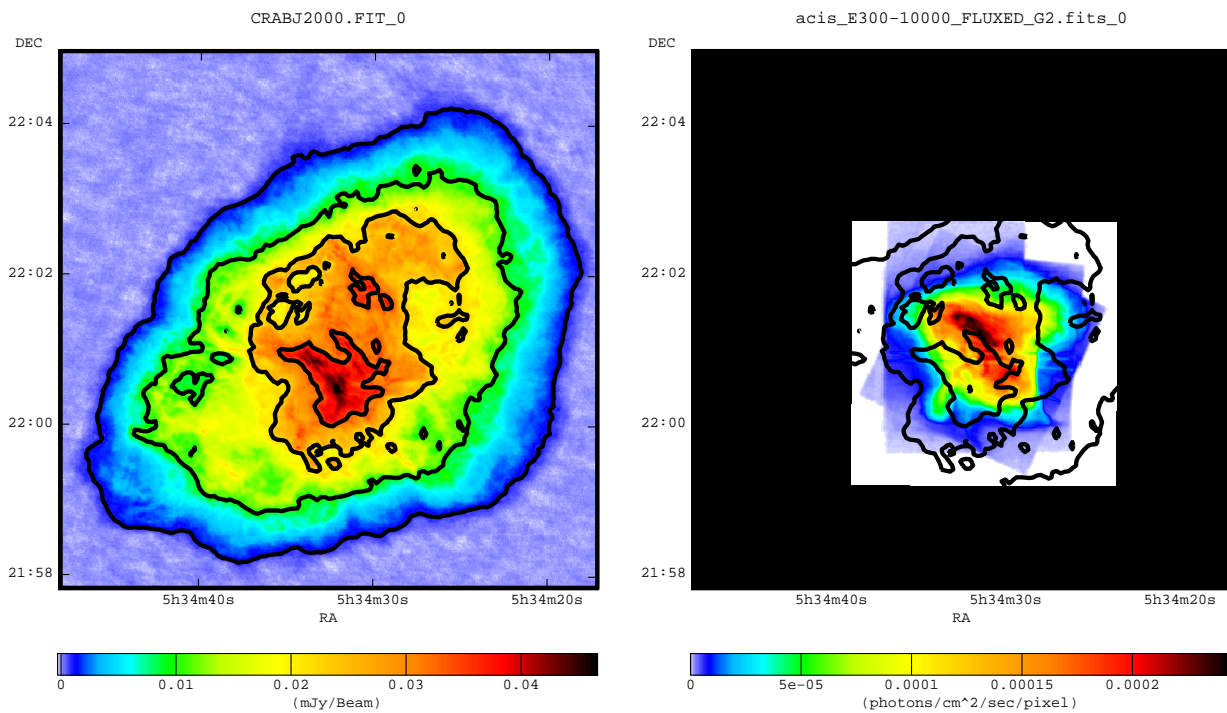
5.4 ObsID 1999

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## 6 Radio Image

- left : radio image
- right : chandra x-ray image with radio contour lines

- This radio image is made from several observation with MEM.
- See the reference( **Bietenholz et al., 2001** ) for the detail.
- This Image is NOT CORRECTED for the VLA primary beam reponse.




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### Summary of Observation

Deconvolution . . . . .	MEM with default
Convolving Beam Size .	1.4"
Peak brightness in image	46.64 mJy/beam
rms background level . . .	0.076 mJy/beam

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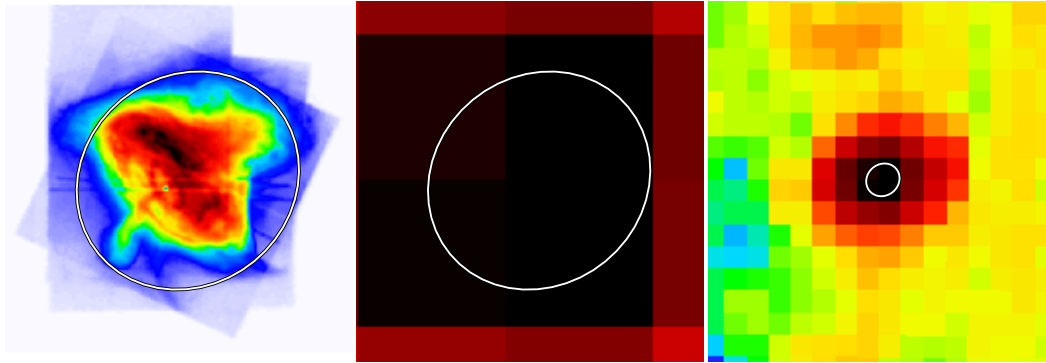


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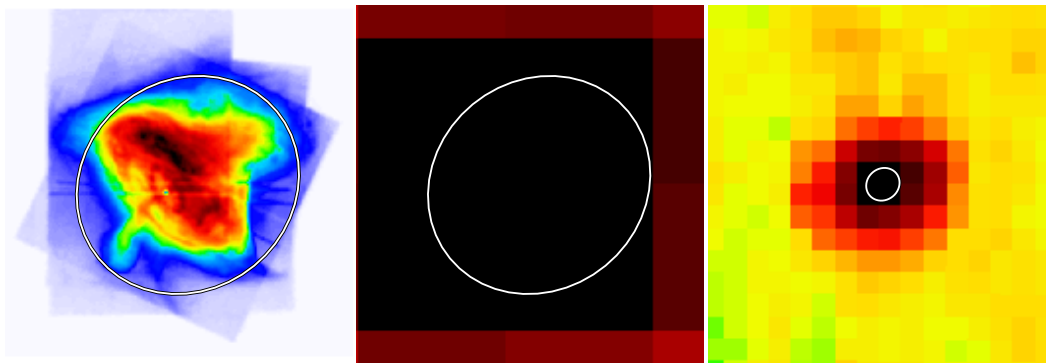
## 7 Images from Survey Missions

- Left : Chandra Image (0.3-10. keV)
- Center : Images from *SkyView* with the **same** scale
- right : Images from *SkyView* with a **reduced** scale

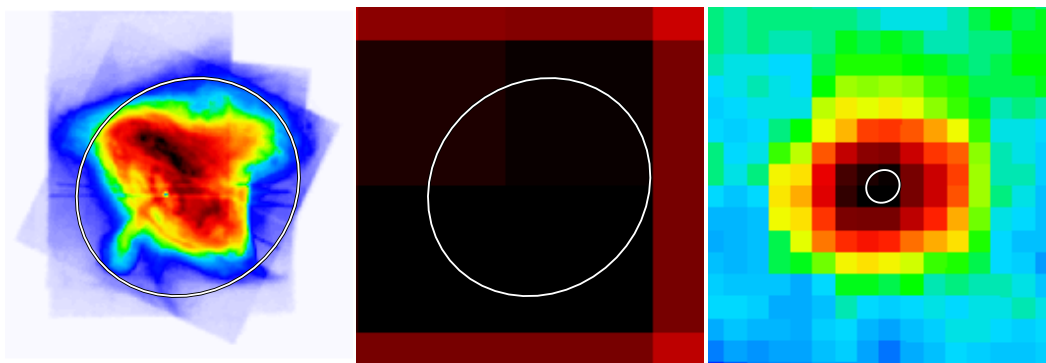
### IRAS 12 micron: Infrared (12 micron)



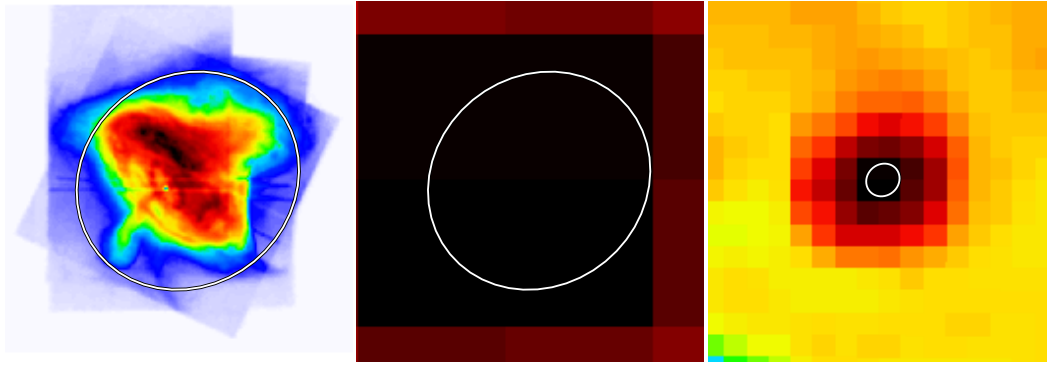
### IRAS 25 micron: Infrared (25 micron)



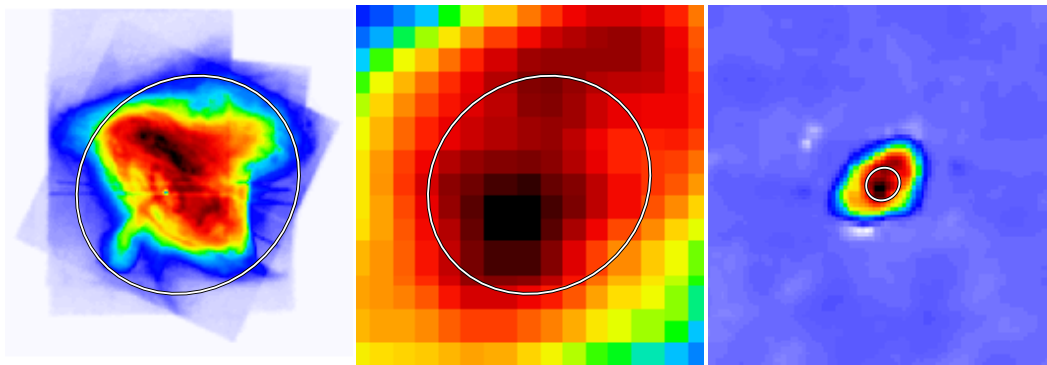
### IRAS 60 micron: Infrared (60 micron)



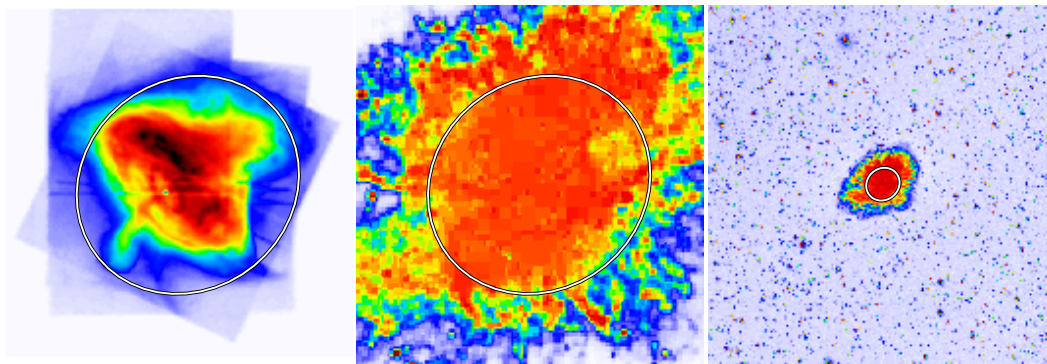
**IRAS 100 micron: Infrared (100 micron)**



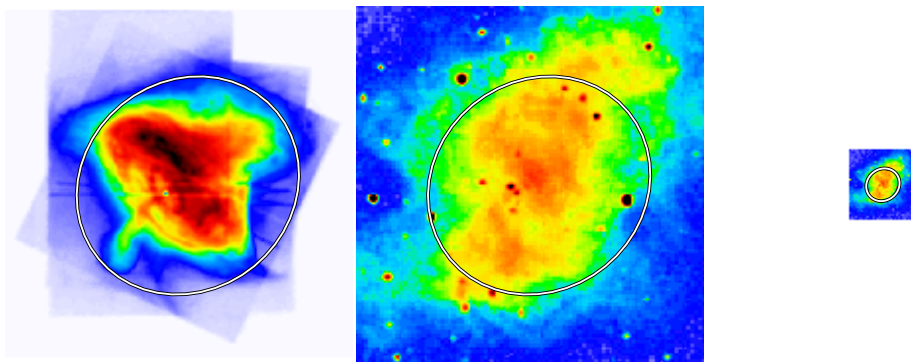
**NRAO VLA Sky Survey (NVSS): Radio (1.4 GHz Continuum)**



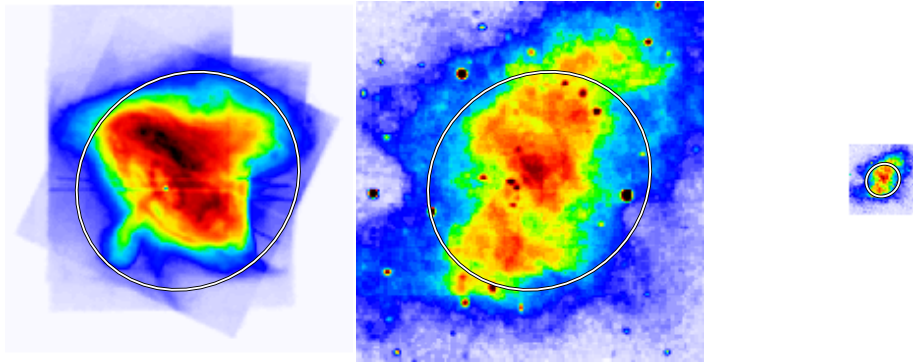
**Digitized Sky Survey: Optical (J or E band images with a few exceptions)**



**2MASS-J.hires.fits:**



**2MASS-H.hires.fits:**



**2MASS-K.hires.fits:**

