

## G011.2-00.3

**1 Summary**

- Distance: 5 kpc ( **Green et al., 1988** )
- Position of Central Source (J2000): ( 18 11 29.2, -19 25 26.4 )
- X-ray size: 4.5'x4.4'
- Description: Circular outer shell with central source

**1.1 Summary of Chandra Observations**

Sequence	Obs ID	Instrument	Exposure <sub>uf</sub> (ks)	Exposure <sub>f</sub> (ks)	Date Observed	Aimpoint (J2000) ( $\alpha$ , $\delta$ )
500076	780	ACIS-235678	21.1	19.4	2000-08-06	( 18 11 29.4, -19 25 25.0 )

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

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

- The whole remnant is covered by chip ACIS-S3(CCD\_ID=7)

**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	9.272e+04	4.791e+00	3.26e-11	3.98e-09	1.19e+37
(780)	0.3 - 2.1	7.100e+04	3.669e+00	1.47e-11	3.95e-09	1.18e+37
	2.1 - 10.	2.202e+04	1.138e+00	1.80e-11	3.00e-11	8.94e+34

- N<sub>H</sub> = 3.14 (10<sup>22</sup> cm<sup>-2</sup>)
- Assumed distance: 5 kpc ( **Green et al., 1988** )
- nH was derived with two thermal plasma model + power law

### 1.3 Nearby Sources

Obs ID	Position (J2000)	Size	Net Count	Count rate	Note
780	( 18 10 32.9, -19 17 53.3 )	< 35.0"	114.0	5.40e-03	
	( 18 10 49.2, -19 31 25.0 )	< 16.3"	26.2	1.24e-03	
	( 18 10 56.9, -19 34 00.7 )	< 15.7"	63.4	3.00e-03	
	( 18 10 59.6, -19 22 33.7 )	< 8.7"	27.2	1.29e-03	
	( 18 11 13.6, -19 33 42.0 )	< 9.0"	267.0	1.26e-02	
	( 18 11 17.1, -19 22 23.1 )	< 5.9"	17.6	8.34e-04	
	( 18 11 19.2, -19 26 33.1 )	< 5.9"	97.2	4.60e-03	
	( 18 11 19.3, -19 29 36.1 )	< 5.9"	16.6	7.86e-04	
	( 18 11 38.6, -19 24 26.0 )	< 5.6"	59.3	2.81e-03	
	( 18 11 40.6, -19 21 54.6 )	< 4.6"	53.2	2.52e-03	
	( 18 11 41.9, -19 28 15.4 )	< 2.3"	41.3	1.96e-03	
	( 18 11 42.1, -19 19 41.0 )	< 8.8"	55.8	2.64e-03	
	( 18 11 42.4, -19 18 42.9 )	< 12.6"	25.9	1.23e-03	

(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

- Green et al., 1988 MNRAS, 231, 735 : VLA at 1.4 and 5 GHz
- Vasisht et al., 1996 ApJ, 456L, 59 : ASCA

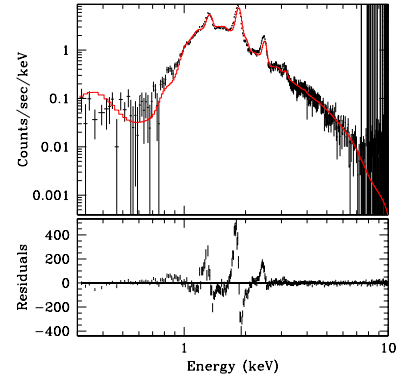
## 2 Fit Detail

- See spectrum page for used regions.

### 2.1 Total:

- Two thermal plasma model and power law
- Elemental abundance of O, Ne, Mg, Fe were thawed.
- Derived nH is much higher than **Vasisht et al.(1996)** (1.38, 2.19).
- Fitting the central source with power law gives nH=1.7, see below.

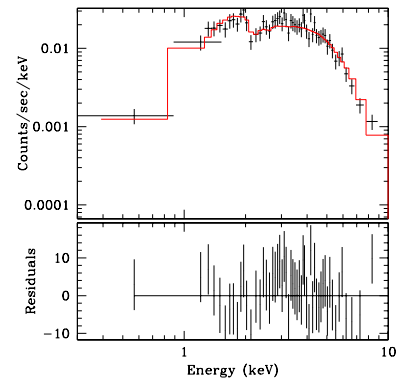
```
source=(xswabs * ((xsvapec + xsvapec) + powlaw1d))
reduced  $\chi^2 = 5.58621$ 
nh = 3.1445 1022/cm2
```



### 2.2 Central Source:

- **central source** was fitted with power law.
- Flux was NOT derived from this fit result!

```
source=(xswabs * powlaw1d)
reduced  $\chi^2 = 0.879599$ 
nh = 1.6675 1022/cm2
```

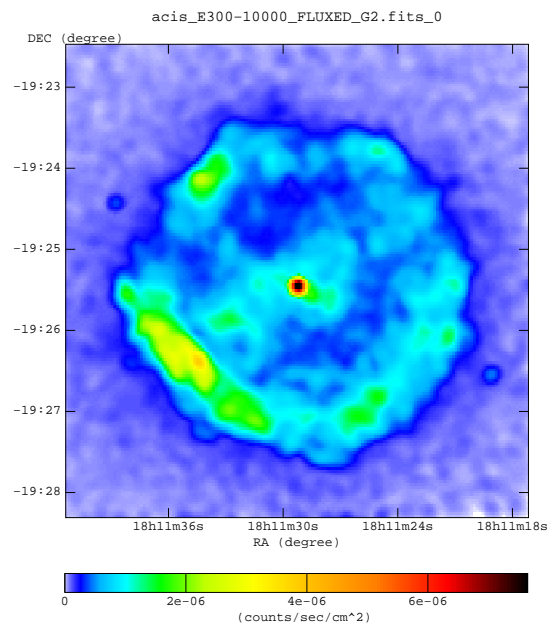
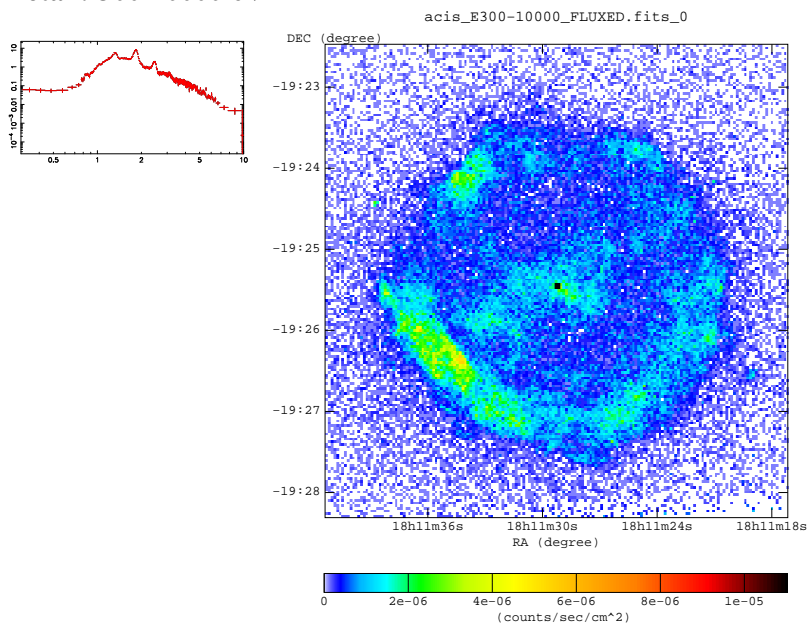


### 3 Chandra Images : Band Images

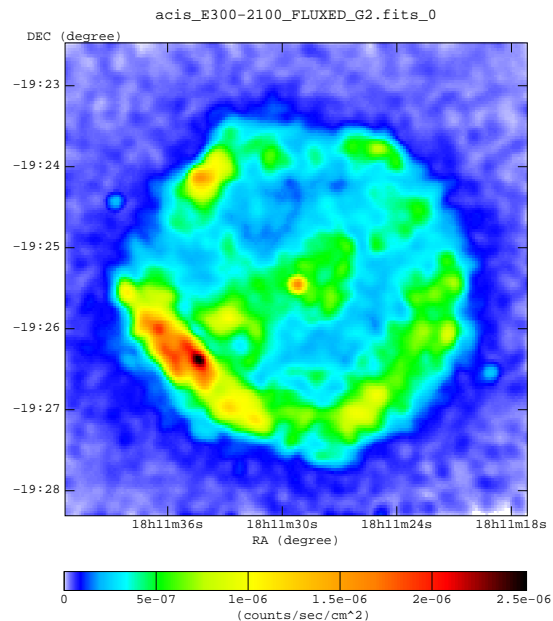
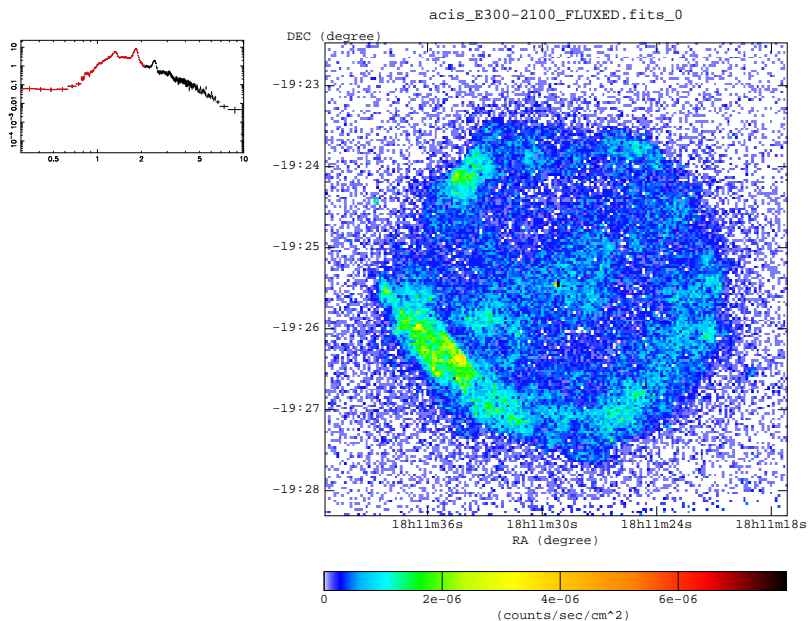
- Left : raw image, binned by 1x1 pixel
- Right : gaussian smoothed version of above ( $\sigma = 2$  pixel)

#### 3.1 Wide Band Images

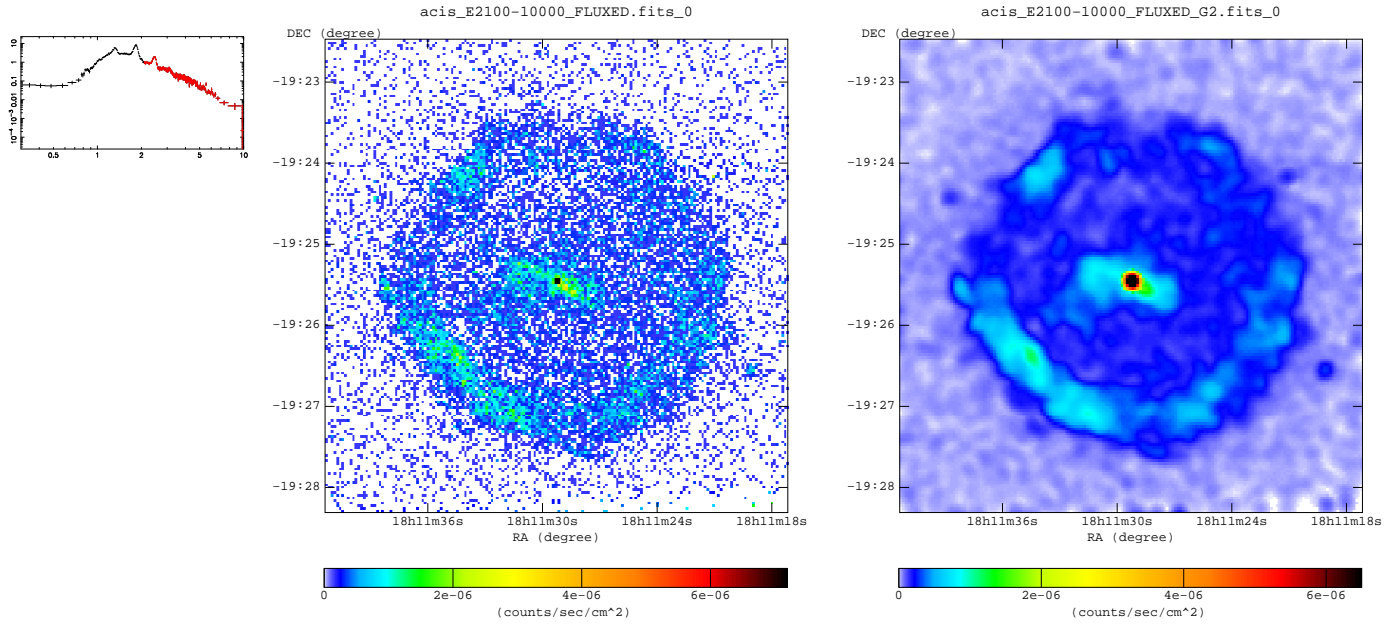
Total : 300-10000 eV



Soft Band : 300-2100 eV

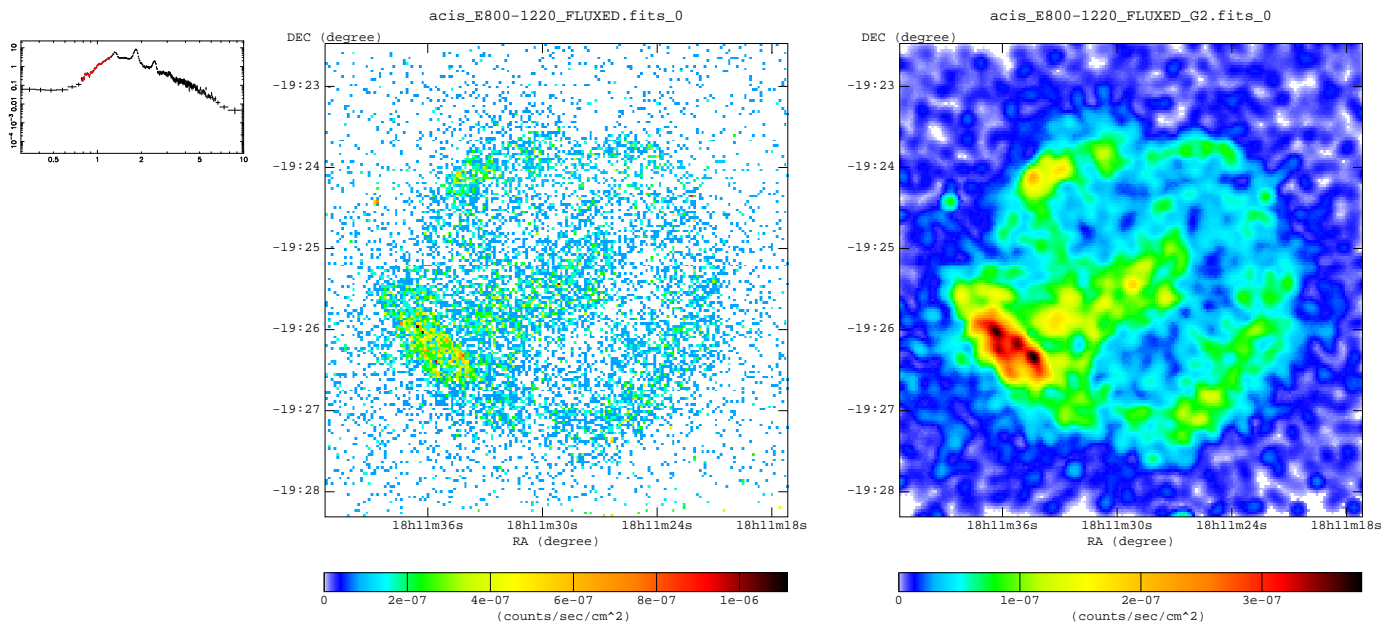


**Hard Band : 2100-10000 eV**

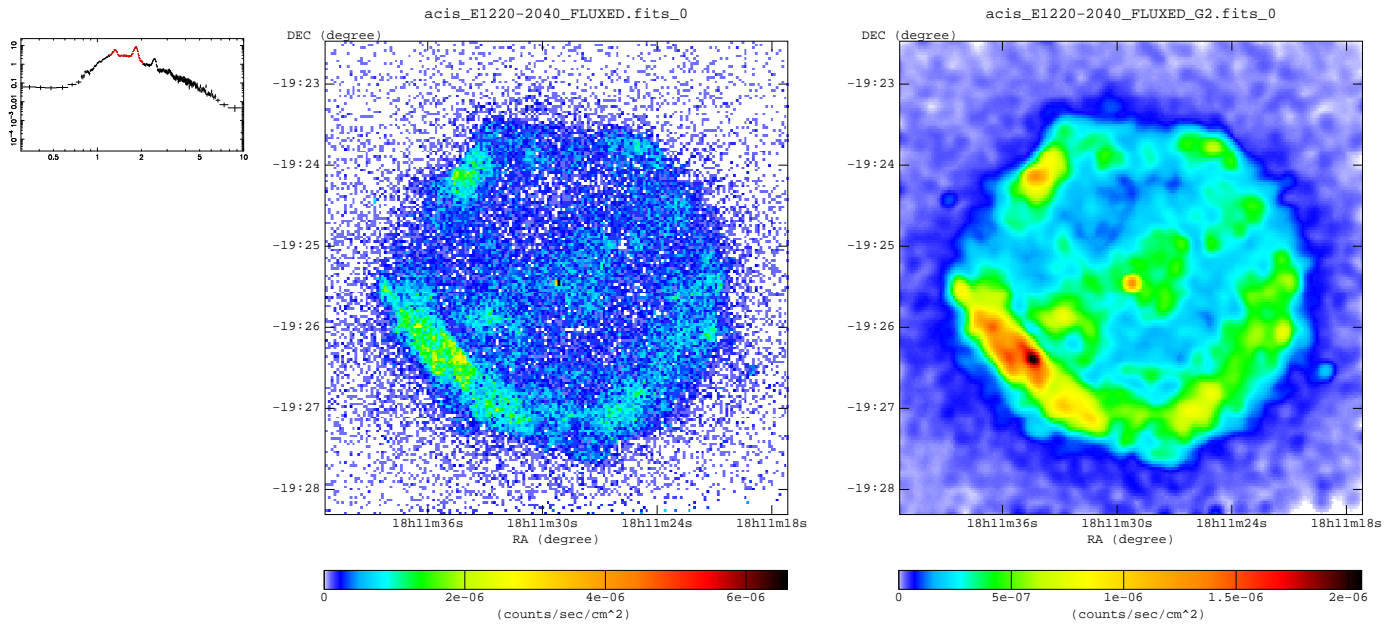


**3.2 Band images used in true color image.**

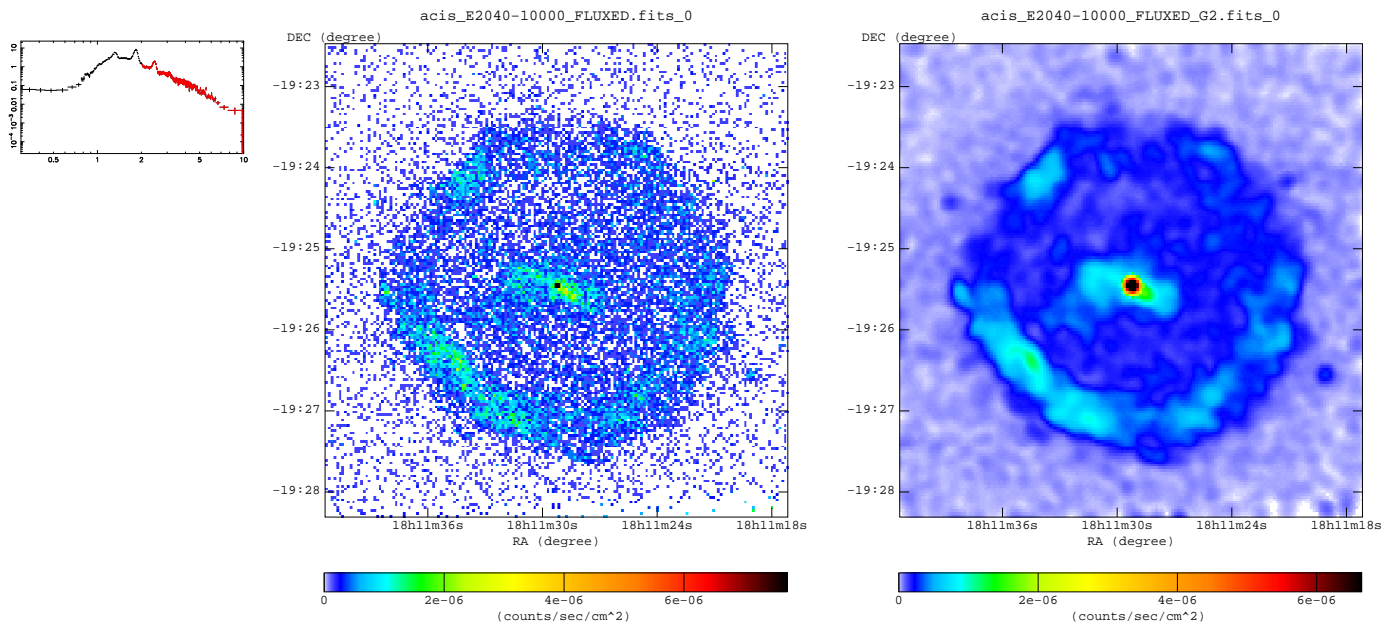
**Red : 800-1220 eV**



**Green : 1220-2040 eV**

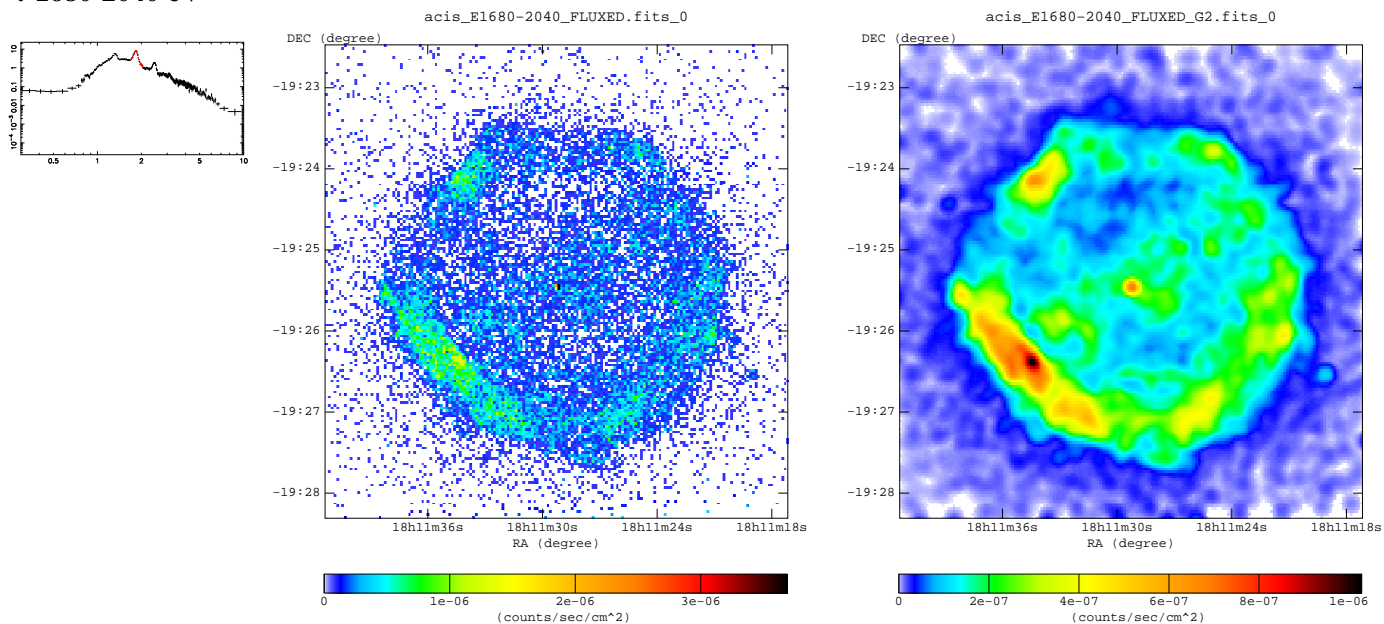


**Blue : 2040-10000 eV**

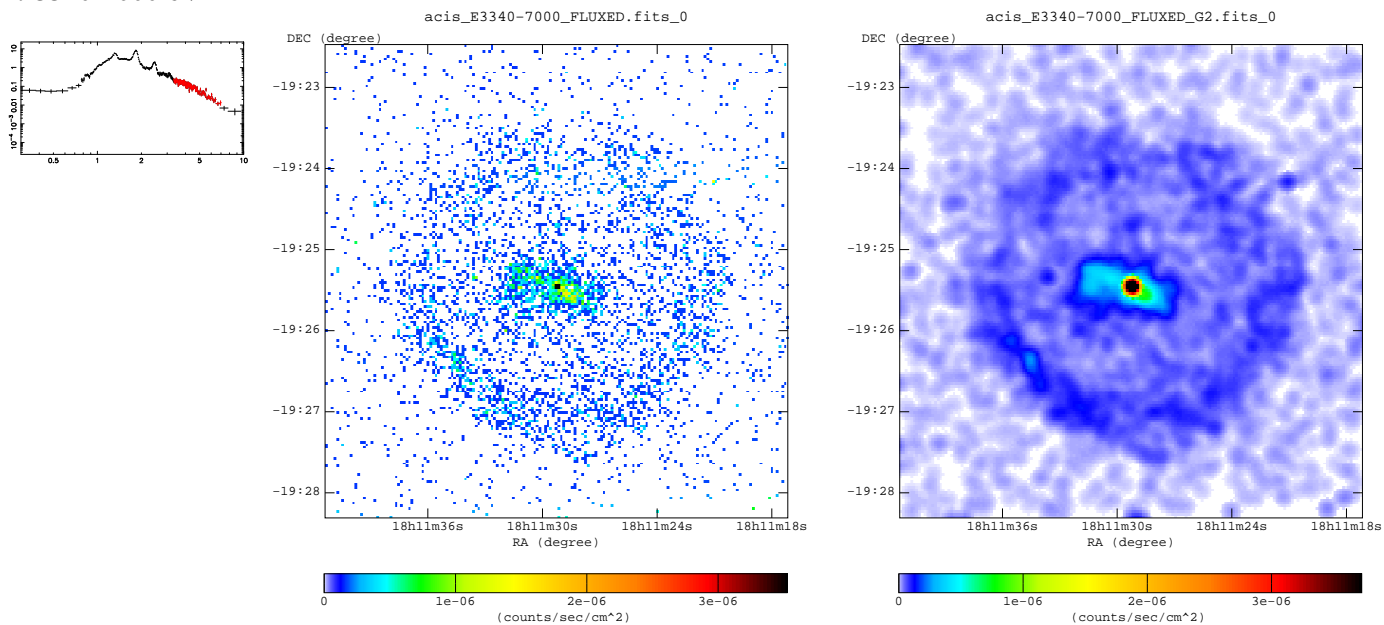


### 3.3 Misc.

#### : 1680-2040 eV



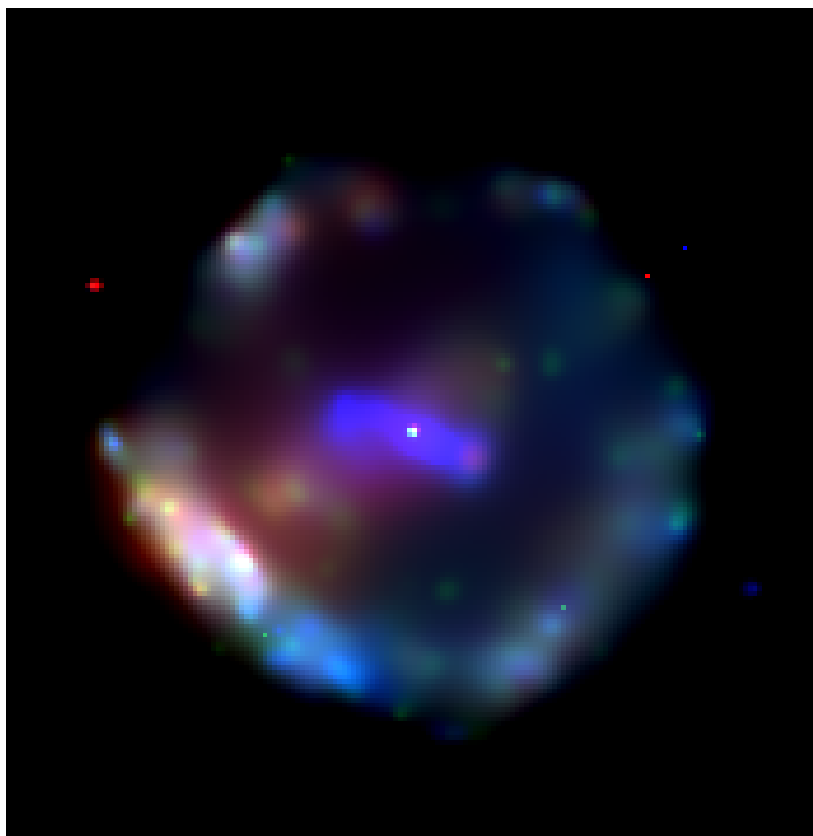
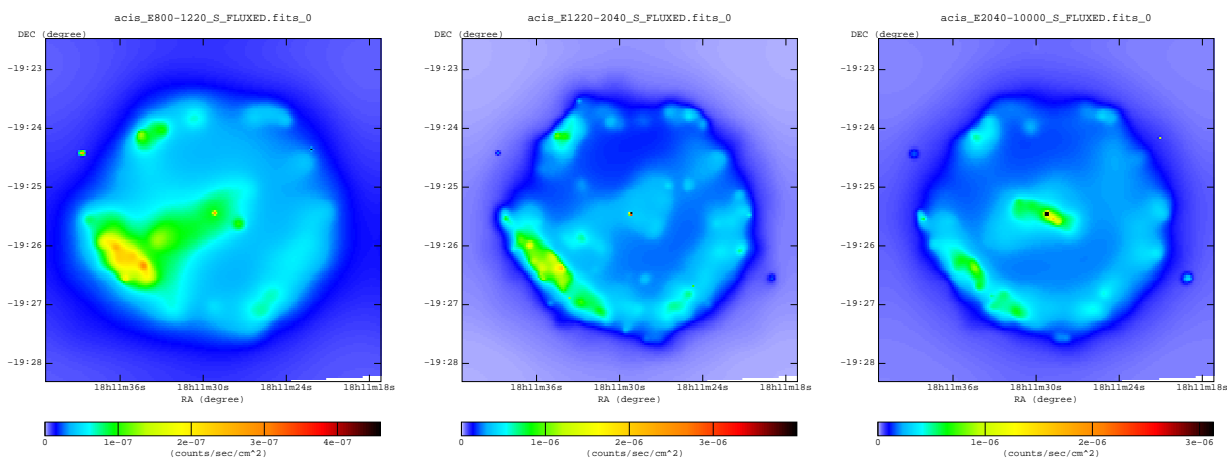
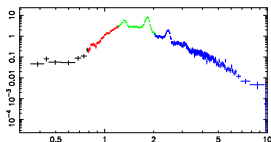
#### : 3340-7000 eV



## 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 : 800-1220 eV  
 GREEN : 1220-2040 eV  
 BLUE : 2040-10000 eV



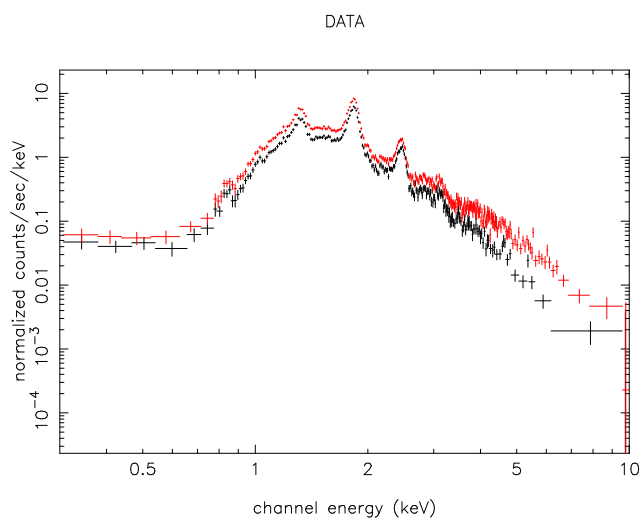
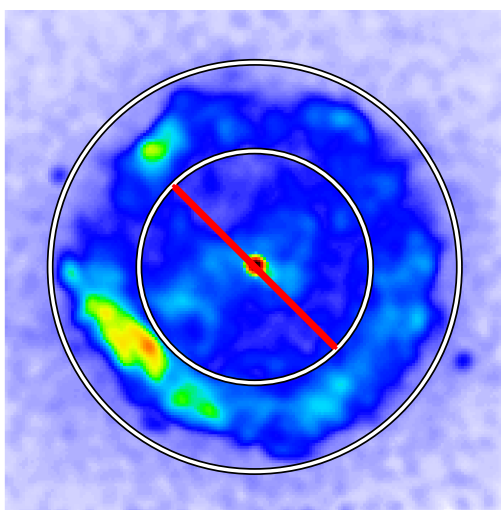
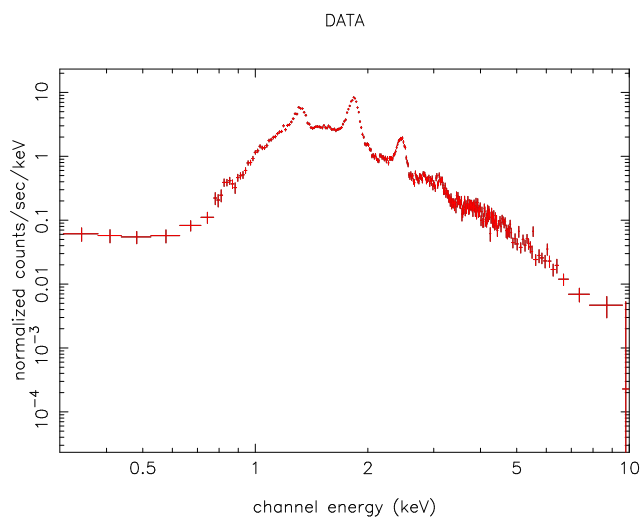
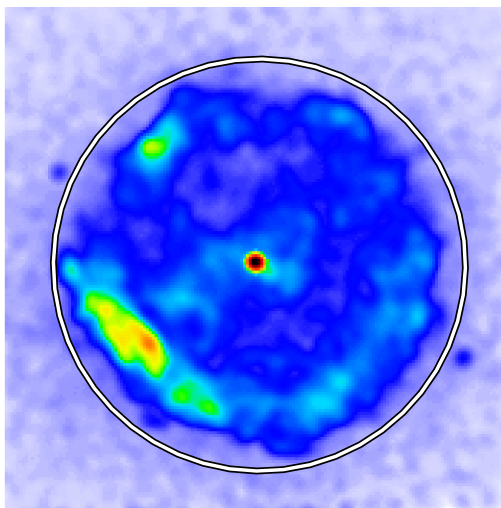
## 5 Chandra Spectrum

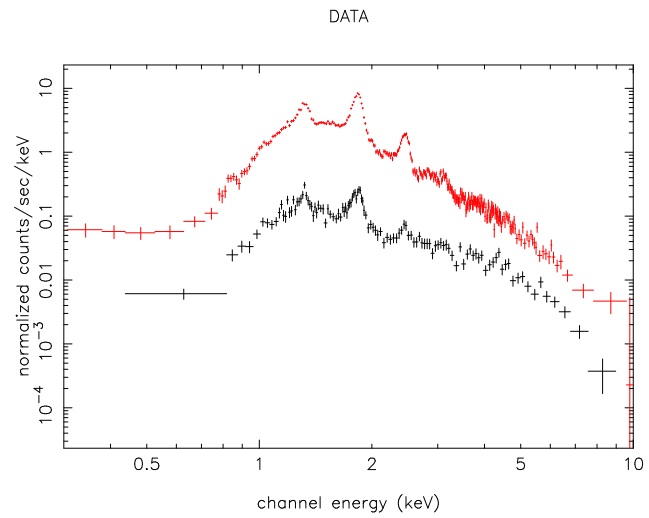
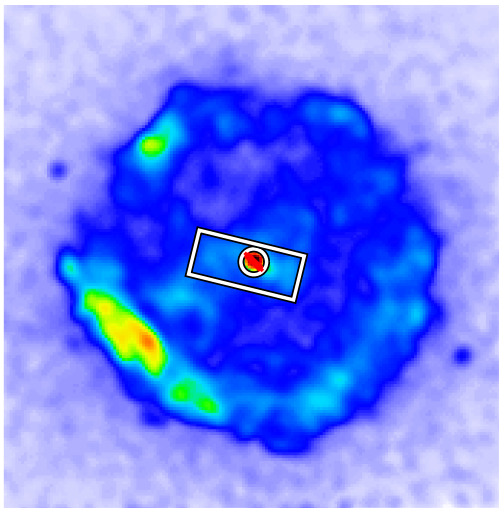
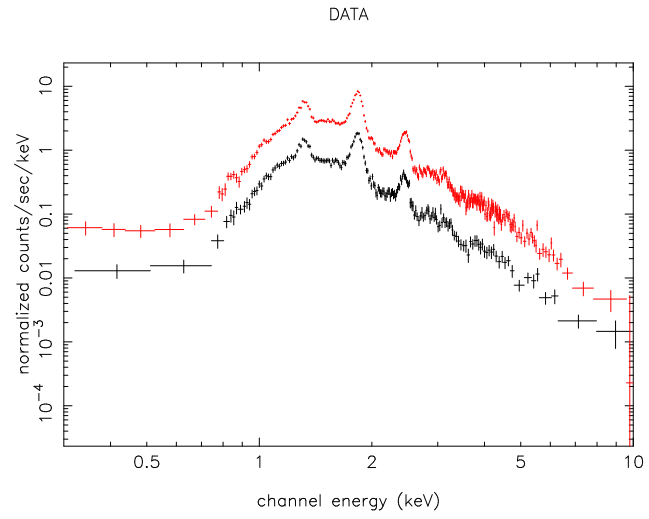
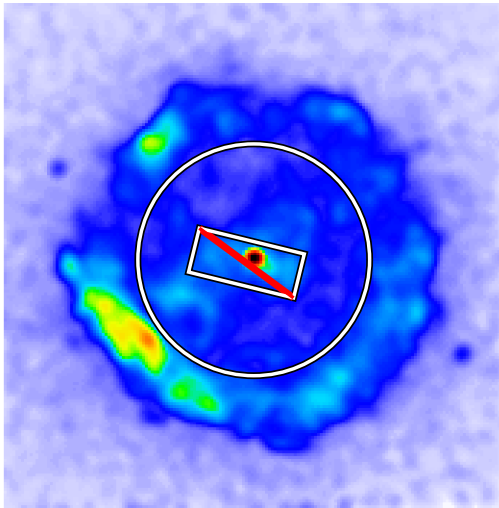
- Images show Regions used to extract spectra
- Regions with red strikes are excluded

### 5.1 ObsID 780

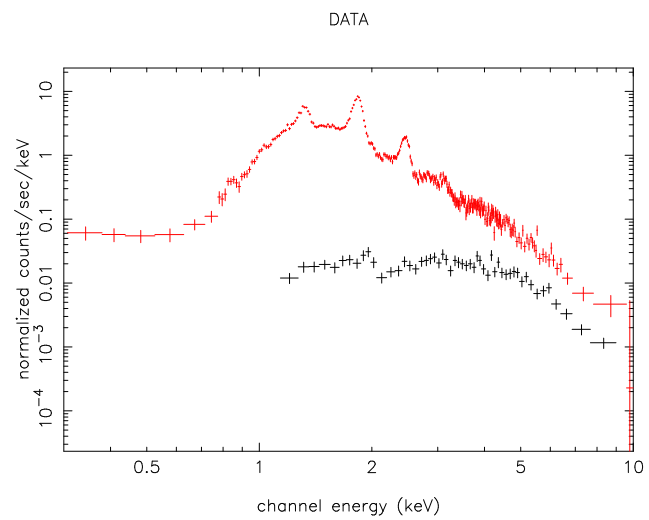
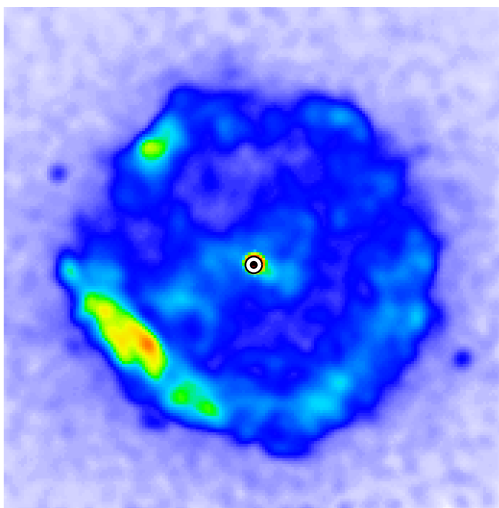
- Background was subtracted from the region around the SNR.

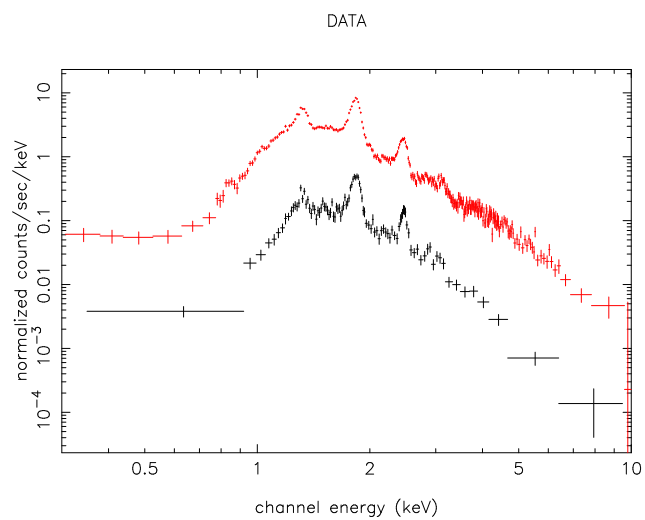
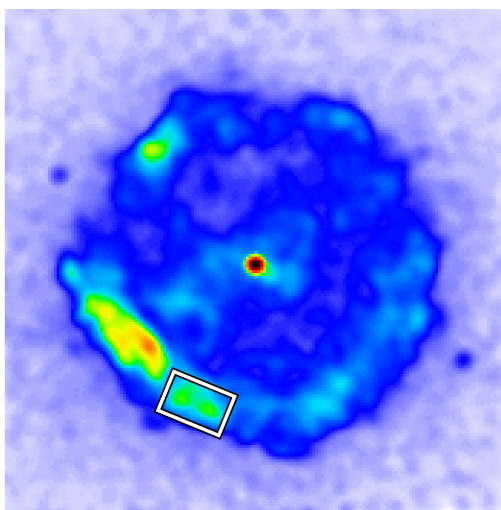
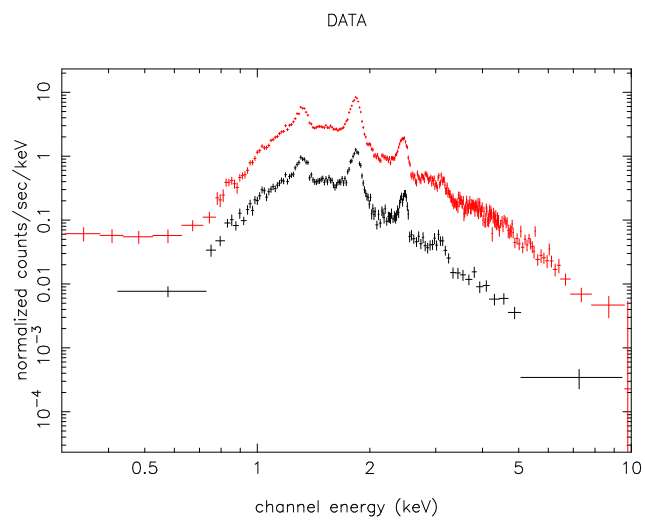
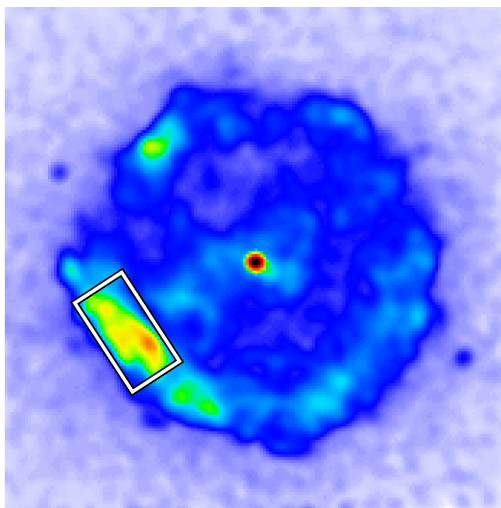
total





### central source



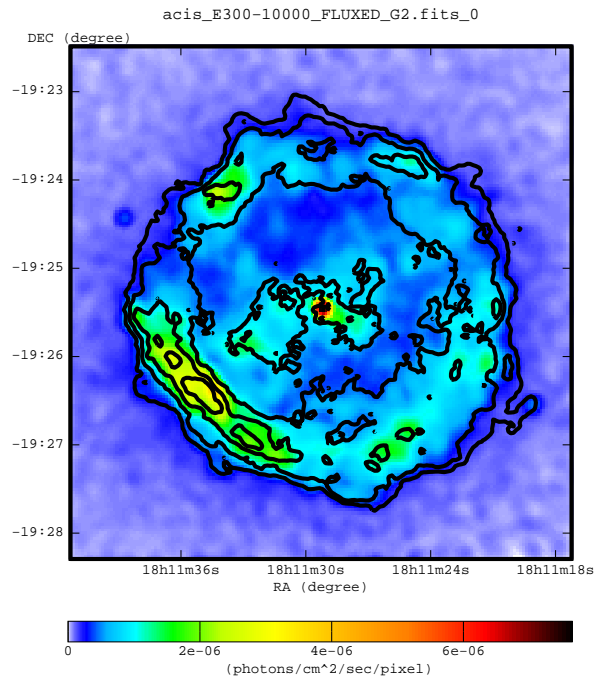
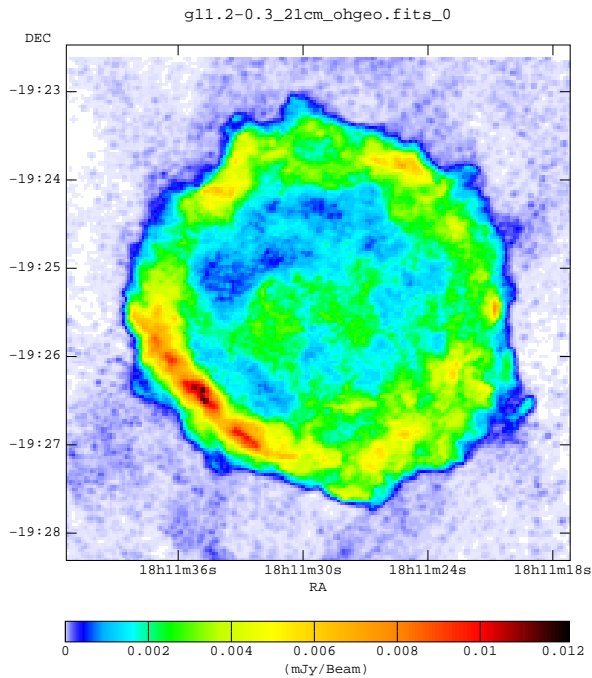


## 6 Radio Image

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

### 21-cm

- . Image from **Green et al.(1988)**
- . 1 GHz flux density: 22 Jy (citepGREEN2001)




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### Summary of Observation

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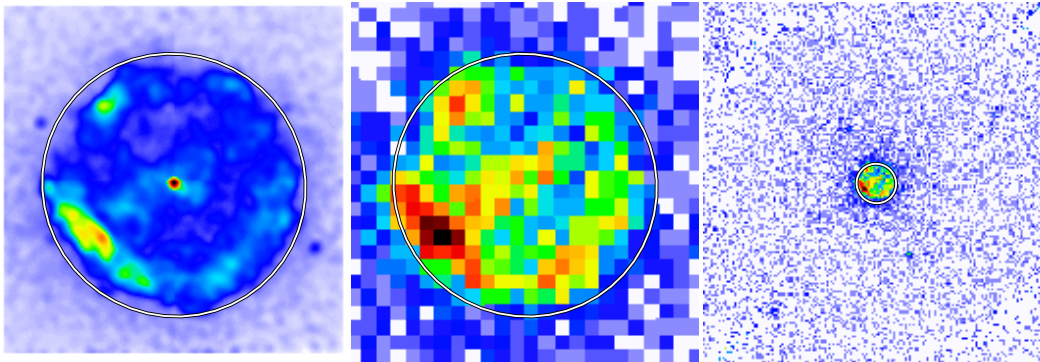
Telescope . . . . .	VLA
Date . . . . .	1984 Jul, 1985 Feb, May
Frequency . . . . .	1.415-1.496 GHz
Beam size . . . . .	3"
1 sigma noise . . . . .	0.21 mJy / beam

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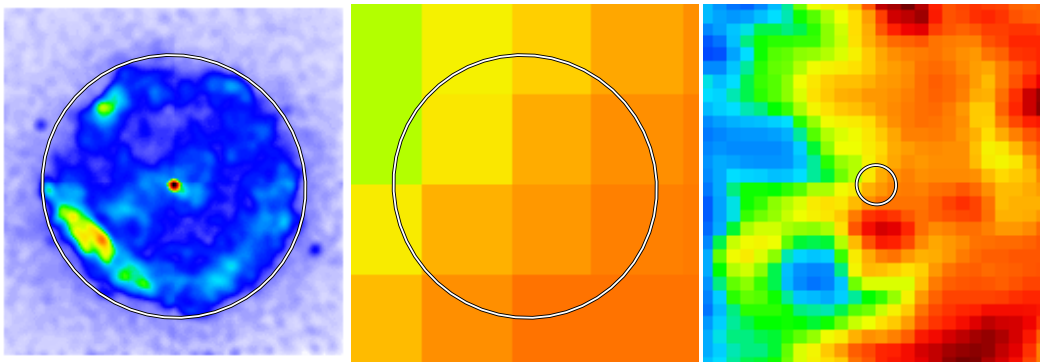
## 7 Images from Survey Mission

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

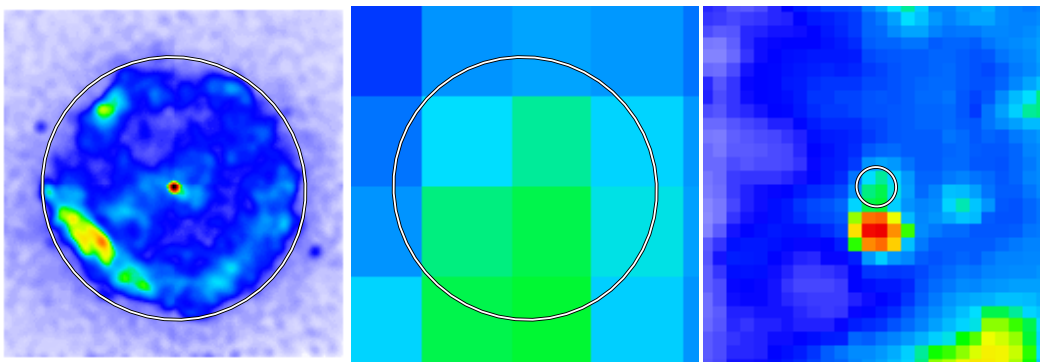
### ROSAT PSPC (1.0 deg): X-ray (0.1-2.4 keV)

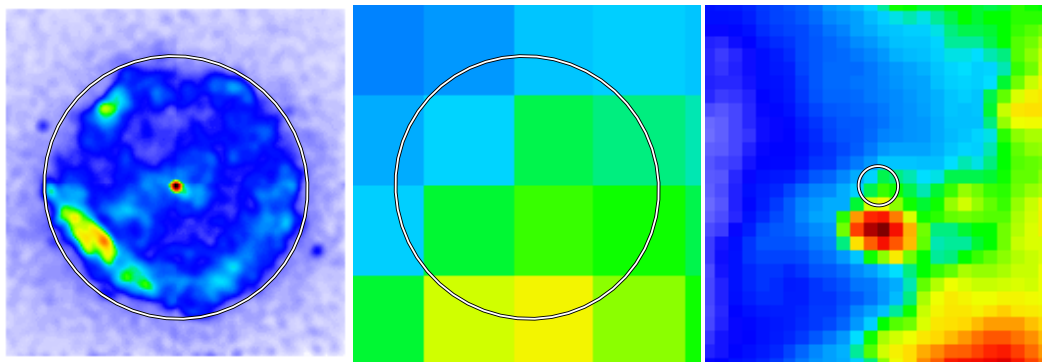
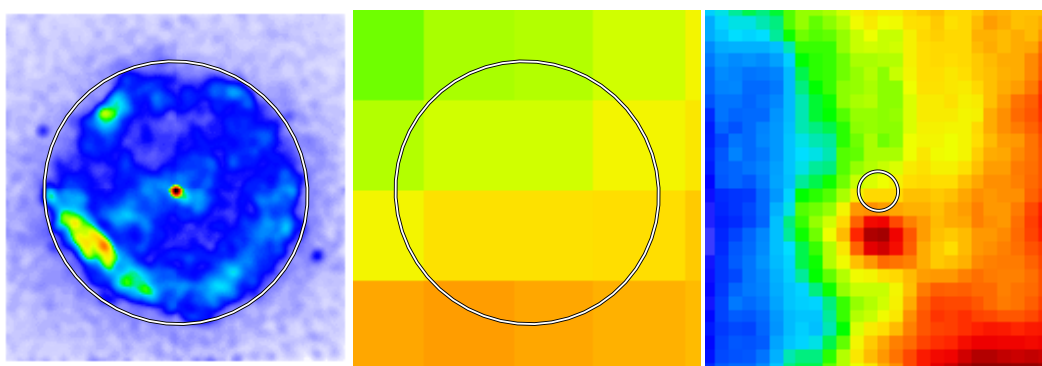
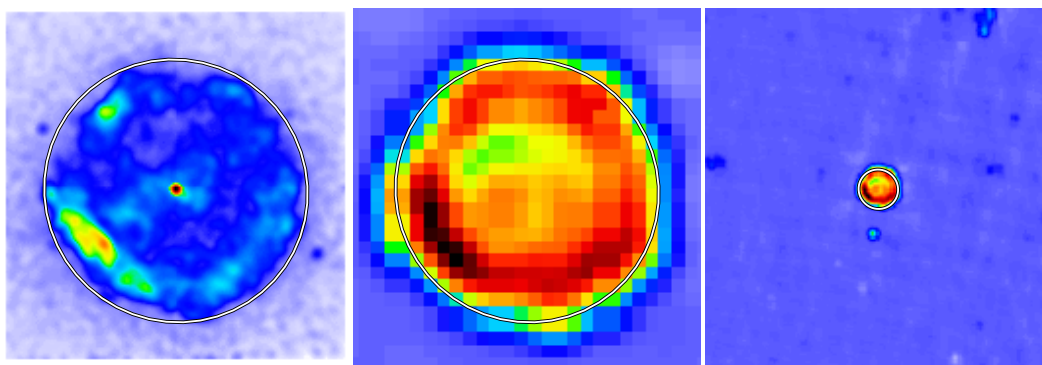


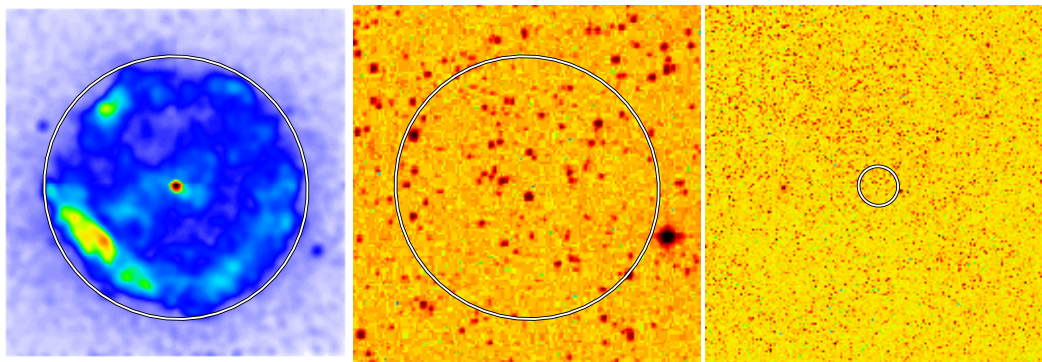
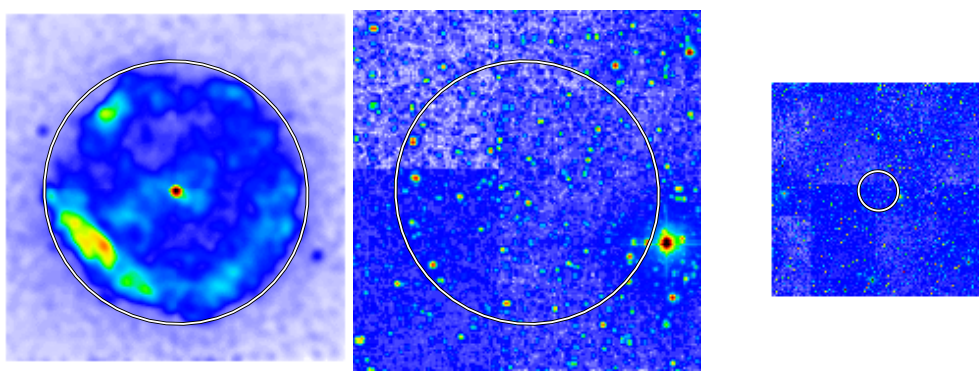
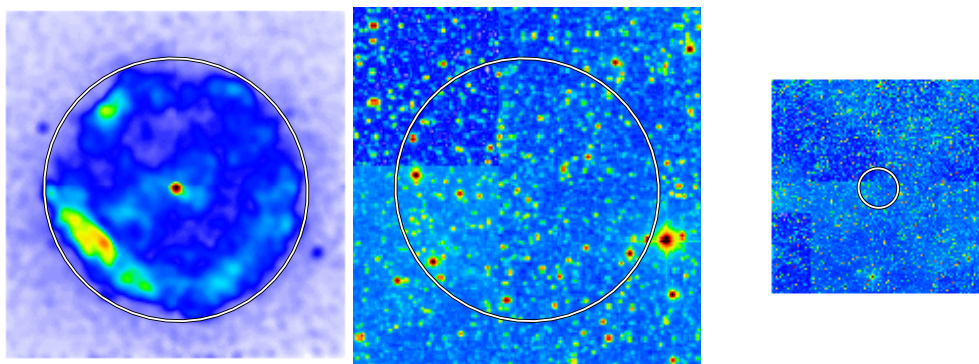
### IRAS 12 micron: Infrared (12 micron)



### 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)****The Two Micron All Sky Survey (J-band): IR (1.25 microns)****The Two Micron All Sky Survey (H-band): IR (1.65 microns)**

**The Two Micron All Sky Survey (K-band): IR (2.17 microns)**

