

# Homework – and other housekeeping matters

- Homework is due at *3:30PM Wednesday* (of the week following a class) instead of Monday.
- Turn in to the Astronomy Mail Room (*CSS 1204*) that closes at 4:30.
- Alternatively, turn in to us in our office or in class.
- Homework will be returned the following Monday (two weeks after it is handed out), so late homework (with a 20%/day penalty) must be in before class on that day.
- The lowest HW score will be dropped.
- HW solutions will be posted on the website after all of the assignments are completed.
- This information is on the updated syllabus – see e-mail attachment, class website.
- The website also has all lecture notes, labs, and assignments.

# **High Energy Databases and Catalogs**

# Accessing Public Data on the Web

- Sources: facility/mission sites, dedicated archives, links from electronic journal articles
- Content: raw and/or processed data, auxiliary data (e.g., calibration), reduction and analysis tools, data products (images, spectra), catalogs

# Accessing Public Data on the Web

Usage:

- (1) Read documentation (manuals, help files, tutorials).
- (2) Identify the object(s) or region(s) of interest.
- (3) ID the type of data required (including wavelength regime).
- (4) Download what you need.

# NASA/IPAC Extragalactic Database (NED)

NED is build around a master list of *extragalactic* objects searchable by name or region. Collected are...

- Source names
- Positions and their Coordinates
- Redshifts and radial velocities
- Optical diameters and magnitudes
- Images from (ground-based) optical and IR all-sky surveys
- Spectra
- Bibliographic references

NED is a good starting point if one is interested in a particular extragalactic object.

# NASA/IPAC EXTRAGALACTIC DATABASE

Latest updates to NED content and interface (September 2010)

Over 760,000 new data entries  
 Additions to Level5, including M. Cignoni and Monica Tosi (2010)  
 Spectra from R. Giovanelli et al (2004)  
 Compilation of Distances: NED-D complete download available  
 Galaxy Morphology: 16,274 entries from The ESO/Uppsala survey of the ESO(B) Atlas  
 New features in the *Classifications by Object Name* service



|  <a href="#">OBJECTS</a> |  <a href="#">DATA</a> |  <a href="#">LITERATURE</a>      |  <a href="#">TOOLS</a> |  <a href="#">INFO</a> |
|---|--|---|---|--|
| <a href="#">By Name</a>   | <a href="#">Images By Object Name</a><br>or <a href="#">By Region</a>                                  | <a href="#">References by Object Name</a>   | <a href="#">Coordinate Transformation &amp; Extinction Calculator</a>                                     | <a href="#">Introduction</a><br><a href="#">Latest News/Updates</a>                                      |
| <a href="#">Near Name</a>   | <a href="#">Photometry &amp; SEDs</a>  | <a href="#">References by Author Name</a>   | <a href="#">Velocity Calculator</a>   | <a href="#">Features</a><br><a href="#">FAQ</a>  |
| <a href="#">Near Position</a>   | <a href="#">Spectra</a>  | <a href="#">Text Search</a>   | <a href="#">Cosmology Calculators</a>   | <a href="#">Overview (pdf)</a>   |
| <a href="#">IAU Format</a>  | <a href="#">Redshifts</a>  | <a href="#">Knowledgebase</a>  | <a href="#">Extinction-Law Calculators</a>  | <a href="#">Source List</a>  |
| <a href="#">By Parameters (All-Sky)</a>   | <a href="#">Redshift-Independent Distances</a>   | <a href="#">Galaxy Distance Tabulations (NED-D)</a>   | <a href="#">Skyplot</a>   | <a href="#">Web Links</a>  |
| <a href="#">By Classifications Types, Attributes</a>  | <a href="#">Classifications by Object Name</a>   | <a href="#">Abstracts</a>   | <a href="#">X/Y offset to RA/DEC</a>  | <a href="#">Glossary &amp; Lexicon</a>   |
| <a href="#">By Refcode</a>  | <a href="#">Positions</a>  | <a href="#">Thesis Abstracts</a>  | <a href="#">Batch Job Submission</a>  | <a href="#">Team</a>   |
| <a href="#">Object Notes</a>  | <a href="#">Diameters</a>  |   | <a href="#">Pick Up Batch Job Results</a>   | <a href="#">Contact Us or Comment</a>  |

If your research benefits from the use of NED, we would appreciate the following acknowledgement in your paper: *This research has made use of the NASA/IPAC Extragalactic Database (NED) which is operated by the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration.*



# NASA/IPAC Extragalactic Database (NED)

NED has five broad sections

- Objects
- Data
- Literature
- Tools
- Info – check out the intro, FAQ, overview

# NASA/IPAC Extragalactic Database (NED)

In addition to “static” data, NED also provides

- Calculators and other tools.
- Coordinate transformations
- Extinction calculator
- Cosmology calculators
- Plotting tools
- Batch jobs
- Much more...

**NASA/IPAC EXTRAGALACTIC DATABASE**

Date and Time of the Query: 2010-09-13 T09:21:36 PDT  
 Help | Comment | NED Home

**You have selected the following parameters to search on:**

Parameters for Distances and Cosmology:  $H_0 = 73.0$ ;  $\Omega_{\text{matter}} = 0.27$ ;  $\Omega_{\text{vacuum}} = 0.73$ ;  
 Derived Quantities use a Redshift corrected to a Reference Frame defined by the 3K CMB

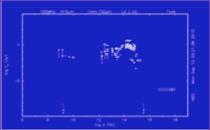
**NED results for object NGC 4649**

1 objects found in NED. Skyplot(first 100)

| SOURCE LIST |                                      |             |                |             |                             |               |               |      |       |      |        |
|-------------|--------------------------------------|-------------|----------------|-------------|-----------------------------|---------------|---------------|------|-------|------|--------|
| Row No.     | Object Name<br>(* => Essential Note) | RA          | EquJ2000.0 DEC | Object Type | Velocity/Redshift<br>km/s z | Mag. / Filter | Separ. arcmin | Refs | Notes | Phot | Number |
| 1           | MESSIER 060                          | 12h43m40.0s | +11d33m10s     | G           | 1117 0.003726               | 9.81          | ...           | 614  | 12    | 101  | 5      |

Detailed information for each object

Object No. 1 - MESSIER 060

| INDEX for MESSIER 060   |   |
|---|---|
| <p><b>Essential Data (jump to sub-section of this query report):</b></p> <ul style="list-style-type: none"> <li><a href="#">Essential Note</a></li> <li><a href="#">Cross-IDs</a></li> <li><a href="#">Coordinates</a></li> <li><a href="#">Basic Data</a></li> <li><a href="#">Quantities Derived from Redshift</a></li> <li><a href="#">Redshift-Independent Distances</a> <b>new</b></li> <li><a href="#">Classifications</a> <b>new</b></li> <li><a href="#">Foreground Galactic Extinction</a></li> <li><a href="#">External Services</a></li> </ul> | <p><b>Detailed Data (NED queries):</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Images</p> </div> <div style="text-align: center;">  <p>101 Photometric data point(s) and SED</p> </div> <div style="text-align: left;"> <p><a href="#">Spectra</a></p> <p><a href="#">Redshift-Independent Distances</a></p> <p><a href="#">614 Reference(s)</a></p> <p><a href="#">5 Position data point(s)</a></p> <p><a href="#">13 Redshift data point(s)</a></p> <p><a href="#">11 diameter data point(s)</a></p> <p><a href="#">12 Note(s)</a></p> <p><a href="#">1 Association(s)</a></p> <p><a href="#">UGC data</a></p> <p><a href="#">RC3 data</a></p> </div> </div> |

**ESSENTIAL NOTE for MESSIER 060** ([Back to INDEX](#))

N/A

**CROSS-IDENTIFICATIONS for MESSIER 060** ([Back to INDEX](#))

| Object Names                     | Type | Object Names                          | Type   |
|----------------------------------|------|---------------------------------------|--------|
| <a href="#">MESSIER 060</a>      | G    | <a href="#">HOLM 448A</a>             | G      |
| <a href="#">NGC 4649</a>         | G    | <a href="#">PGC 042831</a>            | G      |
| <a href="#">UGC 07898</a>        | G    | <a href="#">RBS 1150</a>              | XrayS  |
| <a href="#">ARP 116 NED02</a>    | G    | <a href="#">UZC J124339.7+113307</a>  | G      |
| <a href="#">VV 206a</a>          | G    | <a href="#">RGB J1243+115</a>         | RadioS |
| <a href="#">VCC 1978</a>         | G    | <a href="#">CXOU J124340.0+113311</a> | XrayS  |
| <a href="#">CGCG 071-016</a>     | G    | <a href="#">RX J1243.6+1133</a>       | XrayS  |
| <a href="#">CGCG 1241.1+1150</a> | G    | <a href="#">IRXS J124340.6+113309</a> | XrayS  |

# Data “Archives”

- Sites where data are stored are sometimes called archives.
- Often, after some proprietary period (say, one year) the data become publicly accessible, and may be downloaded.

## Why analyze archival data?

Re-analysis -- new methods, calibration

New focus --

- part of a uniform sample
- look for some new phenomenon discovered elsewhere
- look for variability compared to data elsewhere
- look for counterparts to sources at other wavelengths

# Questions to Consider

- What documentation is available?
- What files do I need?
- Is the data preprocessed?
- Is the data calibrated?
- What format is the data in?
- What software do I need to use the data?
- Who do I acknowledge when I publish the data?

# High Energy Astrophysics Science Archive Research Center (HEASARC)

The screenshot shows the top navigation bar of the HEASARC website. It includes the NASA logo and the text "GODDARD SPACE FLIGHT CENTER" and "Smithsonian Astrophysical Observatory". There are links for "Help/FAQ", "What's New", "Site Map", and "NASA Homepage". A search bar is present with the text "Search enter search terms" and a link to "Advanced Search". Below the search bar is a "HEASARC Quick Links" dropdown menu. The main navigation menu includes "HEASARC HOME", "OBSERVATORIES", "ARCHIVE", "CALIBRATION", "SOFTWARE", "TOOLS", and "STUDENTS / TEACHERS / PUBLIC". The "ARCHIVE" link is circled in red. Below the navigation menu is a banner image with the text "NASA's High Energy Astrophysics Science Archive Research Center".

Access to other NASA archives, such as NED



The screenshot shows two dropdown menus. The first is labeled "Guest Observer Facilities & Science Centers" and has a "Select One" dropdown. The second is labeled "NASA Archives" and also has a "Select One" dropdown. Both dropdowns are circled in red.

HEASARC Tip:

You can easily add tips to the HEASARC tip archive! Submit your tips on the [General HEASARC Feedback page](#).

[View all tips](#)

The High Energy Astrophysics Science Archive Research Center (HEASARC) is the primary archive for NASA missions dealing with extremely energetic phenomena, from black holes to the Big Bang. Having recently merged with the Legacy Archive for Microwave Background Data Analysis (LAMBDA), it includes data obtained by NASA's high-energy astronomy missions from the extreme ultraviolet through gamma-ray bands, along with missions that study the relic cosmic microwave background.

Archive Data Search Form

[More Search Options](#)

Search criteria:

Enter positions, times, missions, ... to [Browse](#).

Try `ROSAT 3c273` to get ROSAT data on 3c273 or `chandra bii>80 status=archived` to get archived Chandra data near the north galactic pole. Use quotes around targets that have embedded white space (e.g., 'ar lac').

- [More examples and interactive feedback](#)
- [Detailed help on the options](#)

Latest News

- [Reminder: RXTE Cycle 15 "Open-Time" Proposals are Due September 16 by 05:00pm EDT \(10 Sep 2010\)](#)

Full details for proposers are available at the above link.

- [VLA SWIRE Deep Field 20-cm Source Catalog \(10 Sep 2010\)](#)

This catalog (Owen and Morrison 2008, AJ, 136, 1889) of 20-cm sources from a survey of a region of the SWIRE Spitzer Legacy Survey is now available in Browse.

- [XSPEC Updated \(09 Sep 2010\)](#)

Version 12.6.0s released September 8, 2010; fix for saving correct normalization for correction file...

NASA GODDARD SPACE FLIGHT CENTER  
Smithsonian Astrophysical Observatory

Help/FAQ  
What's New  
Site Map  
NASA Homepage

Search enter search terms Advanced Search

HEASARC Quick Links  
---Quick Links---

HEASARC HOME OBSERVATORIES ARCHIVE CALIBRATION SOFTWARE TOOLS STUDENTS / TEACHERS / PUBLIC

NASA's HEASARC: Archive

BROWSE ASCII CATALOGS FTP AREA SKYVIEW ARK/RPS VO DATASCOPE OTHER ARCHIVES

The interface to the HEASARC archive is called **Browse**.

Latest News Other Resources Archive Status & Information

Access to the catalogs and astronomical archives of the HEASARC

Select an interface or fill in the Browse Quick Search Form

Browse interactive forms:

- Full database access  
**Browse**  
Full-featured interface - Search all tables by any field. Includes many options
- Browse keyword Search  
Search Engine-like query using keywords
- Index  
List of all tables for each mission
- Correlation  
Cross-correlation of full tables
- Browse Notification Service  
Get notified when new data is available in the archive

Quick Search Form

Search criteria:

Enter positions, times  
Try ROSAT 3c273 to  
chandra bii>80 statu  
Chandra data near the  
Note: For more than one  
qualifier other than a r  
around targets that ha

HEASARC Browse

Archive

Other Browse interfaces:  
Notification Service | Batch | Correlation | Index of all tables | Keyword Search

Main Search Form > Search Results > Choose Data Products

Start Search Reset Detailed Mission/Catalog Search

1. Do you want to search around a position ... ?  
(If you want to search on parameters other than object name or coordinates, select "Detailed Mission/Catalog Search".)

Object Name Or Coordinates: NGC 5813 and/or

Coordinate System: J2000

Search Radius: Default arcmin

... and/or search by date?

Observation Dates: YYYY-MM-DD hh:mm:ss or MJD: DDDDD.ddd

2. What missions and catalogs do you want to search? (Bold text indicates mission is active)

Most Requested Missions

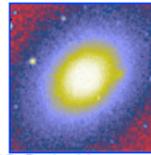
Chandra [CXC] Fermi ROSAT RXTE  
Suzaku Swift WMAP XMM-Newton [XSA]

One commonly searches by **object name** or **position**. One may specify a **search radius**, as well as the **missions** and **catalogs** to be queried.

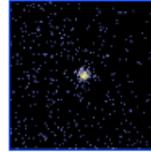
Images generated by [SkyView](#)  
Click on image to see full [SkyView](#) image

## Search was based on:

Object/Coordinates:   
resolved by SIMBAD (local cache) to [ 15 01 11.27, +01 42 07.1 ]  
Coord. System: Equatorial, equinox 2000  
Maximum Rows:   
Search Radius:  arc minutes



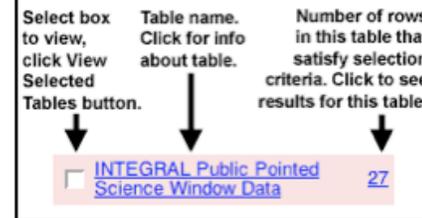
[DSS](#) Optical image, 2.83'



[RASS](#) X-ray image, 75.0'

Images centered on requested position

## How to use the information on this page





## Active HEASARC Missions

|  |  |   |  |    |
|--|--|---|--|----|
| <input type="checkbox"/> <a href="#">ASCA</a>    | <input type="checkbox"/> <a href="#">ASCA Proposals</a>                  | 1 | <input type="checkbox"/> <a href="#">ASCA Master Catalog</a>         | 1  |
| <input type="checkbox"/> <a href="#">CHANDRA</a> | <input checked="" type="checkbox"/> <a href="#">Chandra Observations</a> | 6 | <input type="checkbox"/> <a href="#">Chandra XAssist Source List</a> | 25 |

If no mission or catalog is selected, one gets a list of all of the possible selections with entries located on the sky within the search radius. From among these, we choose to view the table of observations from the *Chandra* X-ray Observatory.

Images generated by [SkyView](#)  
Click on image to see full [SkyView](#) image



Search was based on:

Object/Co

[Main Search Form](#)

Browse Query Results

How to use the information on this page

Tip Archive Hera HELP

Coord. Sy

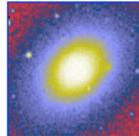
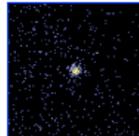
Maximum

Search Ra

Reissue

[Query Information](#)[Query Results](#)[Data Products Retrieval](#)[Help](#)

Images generated by [SkyView](#)  
Click on image to see full [SkyView](#) image

[DSS](#) Optical image, 2.83'[RASS](#) X-ray image, 75.0'

Images centered on requested position

Search was based on:

Object/Coordinates: NGC 5813

resolved by SIMBAD (local cache) to [ 15 01 11.27, +01 42 07.1 ]

Using the coordinates from the SIMBAD resolver for *NGC 5813*.

Coord. System: Equatorial, equinox 2000

Maximum Rows: (no limit)

Search Radius: Default arc minutes

[Reissue Query](#)[Save Query To File](#)[Redisplay](#) as [HTML Table](#)[Printer-Friendly Version](#)[Save All Objects To File](#)[Reset](#)

View Selected

 [ASCA](#) [CHANDRA](#)

**Browse Tip:** Do you know how to get data products? [Learn more on this topic](#) or [See all tips](#)

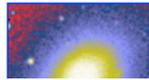
Table Name and Row Count: 1 table queried. A total of 6 rows returned.

[chanmaster.Chandra Observations](#)

6

This returns one table -- the master database of all completed and planned *Chandra* observations -- in this instance, which leads us to...

Images generated by [SkyView](#)  
Click on image to see full [SkyView](#) image



Search was based on:

Object/Co [Main Search Form](#)

## Browse Query Results

How to use the information on this page

Tip Archive Hera HELP

Coord. Sy

Maximum

Search R:

Reissue

[Query Information](#) [Query Results](#) [Data Products Retrieval](#) [Help](#)

**Data Products:** Click checkbox to add row to Data Product Retrieval List

[Chandra Observations \(chanmaster\)](#) [Bulletin](#) [Note](#)

Search radius used: 21.00 '

View Selected

ASCA

CHANDR

These are available

| Select                              | Related Links                       | Services                        | obsid | status     | name    | ra          | dec         | time                | detector | grating | exposure | type | pi      | public date | Search Offset     |
|-------------------------------------|-------------------------------------|---------------------------------|-------|------------|---------|-------------|-------------|---------------------|----------|---------|----------|------|---------|-------------|-------------------|
| <input type="checkbox"/> All        |                                     |                                 | ↑↓    | ↑↓         | ↑↓      | ↑↓          | ↑↓          | ↑↓                  | ↑↓       | ↑↓      | ↑↓ [s]   | ↑↓   | ↑↓      | ↑↓          | ['] from (target) |
| <input type="checkbox"/>            | <a href="#">ASCA ROSAT RXTE XMM</a> | <a href="#">O R N S D H</a>     | 12951 | unobserved | NGC5813 | 15 01 06.80 | +01 40 44.7 | 2011-09-08          | ACIS-S   | NONE    | 160000   | GO   | Randall |             | 1.770 (NGC 5813)  |
| <input type="checkbox"/>            | <a href="#">ASCA ROSAT RXTE XMM</a> | <a href="#">O R N S D H</a>     | 12952 | unobserved | NGC5813 | 15 01 06.80 | +01 40 44.7 | 2011-09-10          | ACIS-S   | NONE    | 160000   | GO   | Randall |             | 1.770 (NGC 5813)  |
| <input type="checkbox"/>            | <a href="#">ASCA ROSAT RXTE XMM</a> | <a href="#">O R N S D H</a>     | 12953 | unobserved | NGC5813 | 15 01 06.80 | +01 40 44.7 | 2011-09-13          | ACIS-S   | NONE    | 160000   | GO   | Randall |             | 1.770 (NGC 5813)  |
| <input checked="" type="checkbox"/> | <a href="#">ASCA ROSAT RXTE XMM</a> | <a href="#">O R N S D H F</a>   | 9517  | archived   | NGC5813 | 15 01 07.01 | +01 41 01.9 | 2008-06-05 20:18:39 | ACIS-S   | NONE    | 100060   | GO   | Forman  | 2009-06-09  | 1.521 (NGC 5813)  |
| <input type="checkbox"/>            | <a href="#">ASCA ROSAT RXTE XMM</a> | <a href="#">O R N S D H B F</a> | 5907  | archived   | NGC5813 | 15 01 11.30 | +01 42 07.1 | 2005-04-02 06:44:19 | ACIS-S   | NONE    | 49040    | GO   | Sarazin | 2006-04-05  | 0.009 (NGC 5813)  |
| <input type="checkbox"/>            | <a href="#">ASCA ROSAT RXTE XMM</a> | <a href="#">O R N S D H</a>     | 12954 | unobserved | NGC5813 | 15 01 06.80 | +01 40 44.7 | 2011-09-17          | ACIS-S   | NONE    | 20000    | GO   | Randall |             | 1.770 (NGC 5813)  |

6 rows retrieved from chanmaster

● Browse

Tabl

cha



### Data Product Retrieval

- Select the checkboxes for the rows of interest above,
- Un-check any data products below you are not interested in
- Select the Data Product Retrieval tab for retrieval options

#### Data Products available for chanmaster

- All
- Chandra Proposal Abstracts (abstracts)
- Events Lists (events)
- FITS and JPEG Images (images)
- Miscellaneous Files (misc)
- Orbit and Aspect Files (orbit)
- Processing Summary Files (psumm)

[Show current rows selected for Data Products Retrieval](#)

### Further Actions:

- Do you want to  your chanmaster results? ([help](#))
- Do you want to  your chanmaster results with another catalog or table? ([help](#))

...the list of observations, from which we select the longest and most recently archived observation

**Data Products Download Options and Other Services****Data Products Download Options**

for data products for selected rows

[What is Hera?](#)

Optionally, add a file name constraint to specify product types, e.g., \*/hri/\*.gif\* Use a semicolon (;) for multiple constraints, e.g., \*fits\*;\*.gif\*

[File name filter](#)**Other services for selected rows**

all the columns for selected rows

Web-based services for selected rows

NED

SIMBAD

SkyView:ROSAT All-Sky

SkyView:DSS

CoCo

[Web-based services help](#)**Data products that you have selected will be appear below** Select all rows**Chandra Observations**

| obsid                               | status | name     | ra      | dec         | time        | detector            | grating | exposure | type   | pi | public | date       | Search Offset    |
|-------------------------------------|--------|----------|---------|-------------|-------------|---------------------|---------|----------|--------|----|--------|------------|------------------|
| <input checked="" type="checkbox"/> | 9517   | archived | NGC5813 | 15 01 07.01 | +01 41 01.9 | 2008-06-05 20:18:39 | ACIS-S  | NONE     | 100060 | GO | Forman | 2009-06-09 | 1.521 (NGC 5813) |

We can now preview the data and retrieve the requested FITS files....

## Data Products Download Options and Other Services

## Data Products Download Options

[Create Download Script](#)

for data products for selected rows

[Preview and Retrieve](#)

data products for selected rows

[Retrieve](#)

data products for selected rows

[Save to Hera](#)

data products for selected rows

[What is Hera?](#)

Optionally, add a file name constraint to specify, e.g., \*/hri/\*.gif\* Use a semicolon (;) for multiple

[File name filter](#)

## Data products that you have selected

 Select all rows

## Chandra Observations

| obsid                               | status | name     | ra      | dec                  |
|-------------------------------------|--------|----------|---------|----------------------|
| <input checked="" type="checkbox"/> | 9517   | archived | NGC5813 | 15 01 07.01 +01 41 0 |

## Other services for selected rows

[Display](#)

all the columns for selected rows

Web-based services for selected rows

NED

SIMBAD

[Chandra Observations \(chanmaster\)](#) [FTOOLS](#)

| obsid | status   | name    | ra          | dec         | time                | detector | grating | exposure | type | pi     | public_date |
|-------|----------|---------|-------------|-------------|---------------------|----------|---------|----------|------|--------|-------------|
| 9517  | archived | NGC5813 | 15 01 07.01 | +01 41 01.9 | 2008-06-05 20:18:39 | ACIS-S   | NONE    | 100060   | GO   | Forman | 2009-06-09  |

 Select all products in this row

## FITS and JPEG Images

 Center Image (acisf09517N001\_cntr\_img2.fits.gz) [FITS](#) 303 kB Center Image (acisf09517N001\_cntr\_img2.jpg) [JPEG](#) 694 kB Full Image (acisf09517N001\_full\_img2.fits.gz) [FITS](#) 93 kB Full Image (acisf09517N001\_full\_img2.jpg) [JPEG](#) 50 kB Source Image (acisf09517N001\_src\_img2.jpg) [JPEG](#) 51 kB Source List (acisf09517N001\_src2.fits.gz) [FITS](#) 26 kB[TAR selected products](#)[Create Download Script](#)[Reset](#)

...and create a single *tarfile* containing all of these files.

**Data Products Download Options and Other Services****Data Products Download Options** for data products for selected rows data products for selected rows data products for selected rows data products for selected rows[What is Hera?](#)**Other services for selected rows** all the columns for selected rows

Web-based services for selected rows

NED  
SIMBADOptionally, add a file name constraint to specify  
e.g., \*/hri/\*.gif\* Use a semicolon (;) for multiple

File name filter

[Chandra Observations \(chanmaster\)](#) [FTOOLS](#)

| obsid | status   | name    | ra          | dec         | time                | detector | grating | exposure | type | pi     | public_date |
|-------|----------|---------|-------------|-------------|---------------------|----------|---------|----------|------|--------|-------------|
| 9517  | archived | NGC5813 | 15 01 07.01 | +01 41 01.9 | 2008-06-05 20:18:39 | ACIS-S   | NONE    | 100060   | GO   | Forman | 2009-06-09  |

 Select all products in this row**Archive****Retrieve Data Products**

Data pro

 Select [Choose Tables](#) > Choose Data Products > **Retrieve Data Products**Chandra **Estimated size of TAR file: 303 kB**

Your TAR file is being created now. When finished you may retrieve it via the following link

obsid

 9517<http://heasarc.gsfc.nasa.gov/FTP/retrieve/w3browse/w3browse-172321.tar>.**Note:** We have phased out retrieval of data product tar files via FTP.

Please wait until the "TAR complete" message appears below before retrieving.

**Data products included in the TAR file:** (filenames ending in '.gz' or '.Z' have been compressed for faster downloading.)

Tarred: /FTP/chandra/data/science/ao09/cat6//9517/primary/acisf09517N001\_cnr\_img2.fits.gz

**TAR complete:** Actual size: 310 kB.

The tarfile with the requested data is now available for downloading.

***In the directory where the data was downloaded (here ``loew’’), unpack the tarfile. Move the image fits file back to the original directory and uncompress it, deleting unneeded subdirectories. (Alternatively, **cd 9517/primary, and work in that directory**).***

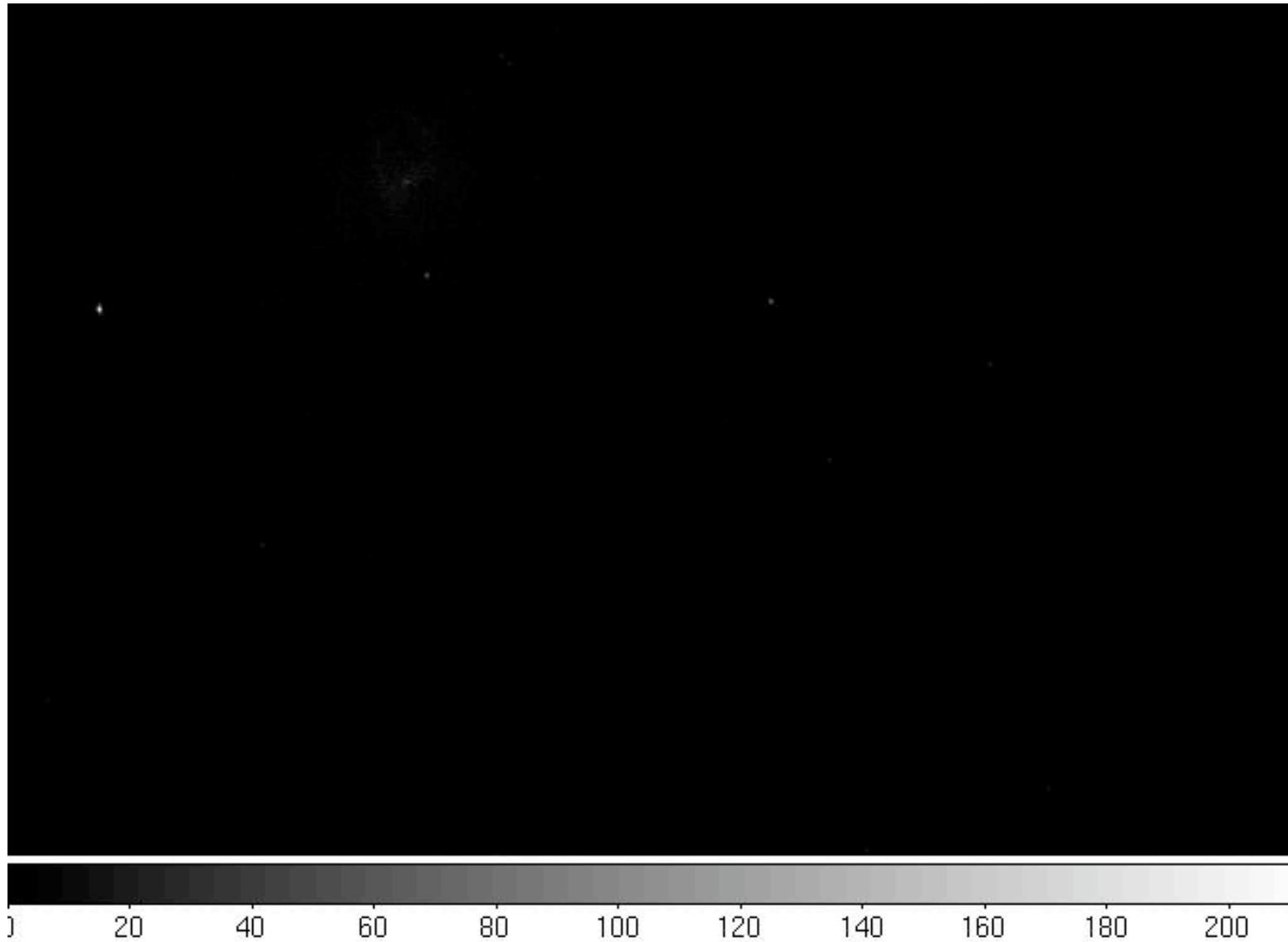
```
loew% tar -xvf w3browse-172321.tar
9517/primary/acisf09517N001_cntr_img2.fits.gz
loew% mv 9517/primary/acisf09517N001_cntr_img2.fits.gz .
loew% ls 9517
primary
loew% ls 9517/primary
loew% rm -r -i 9517
examine files in directory 9517? y
examine files in directory 9517/primary? y
remove 9517/primary? y
remove 9517? Y
loew% ls 9517
ls: 9517: No such file or directory
loew% rm -i w3browse-172321.tar
remove w3browse-172321.tar? y
loew% gunzip acisf09517N001_cntr_img2.fits.gz
loew% ls *.fits
acisf09517N001_cntr_img2.fits
ds9 acisf09517N001_cntr_img2.fits &
```

Steps leading from the download to opening the image FITS file with ds9 -- a combination of UNIX practice and “tidying” up.

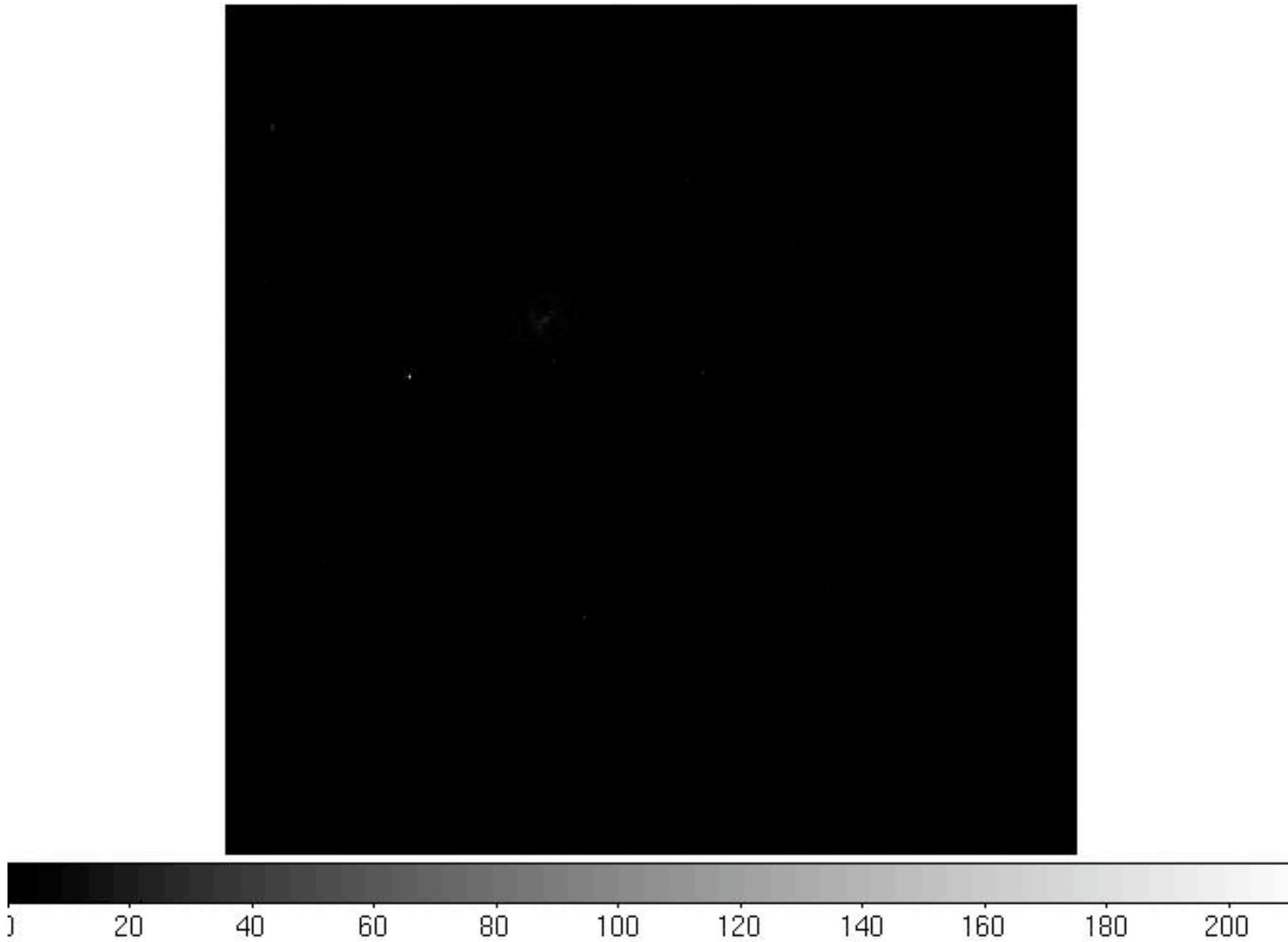
# ***Overlaying X-ray contours on an optical image – step-by-step***

See, also, <http://cxc.harvard.edu/ciao/threads/ds9/>.  
(which has a link to ds9 manuals)

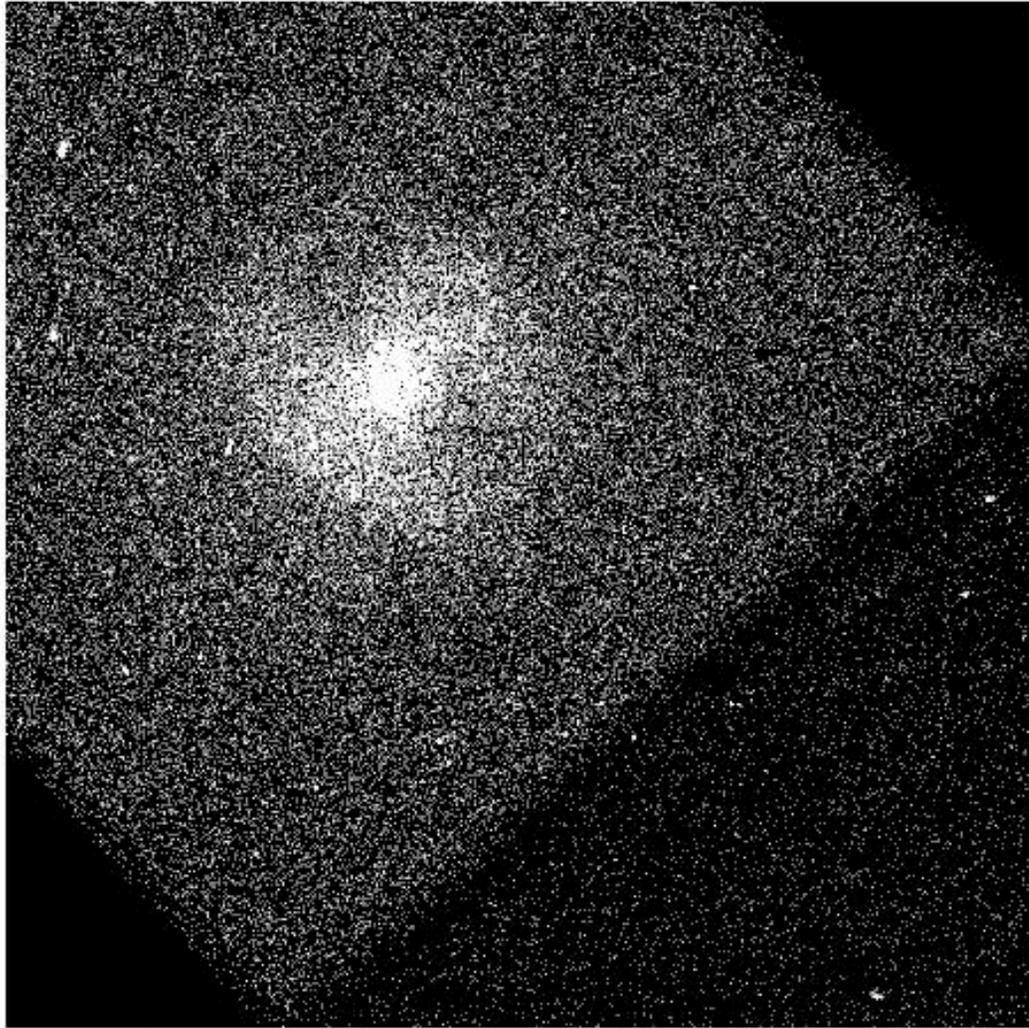
The example shown utilizes *Chandra* X-ray, and DSS optical, images of the NGC 5813 elliptical galaxy. While the optical photons originate in stars in the galaxy, the diffuse X-rays are emitted by 8 million K hot interstellar gas. The structure in the hot gas is attributed to outbursts from the an active galactic nuclei in the galactic center. For more details, see <http://arxiv.org/abs/1006.4379>.



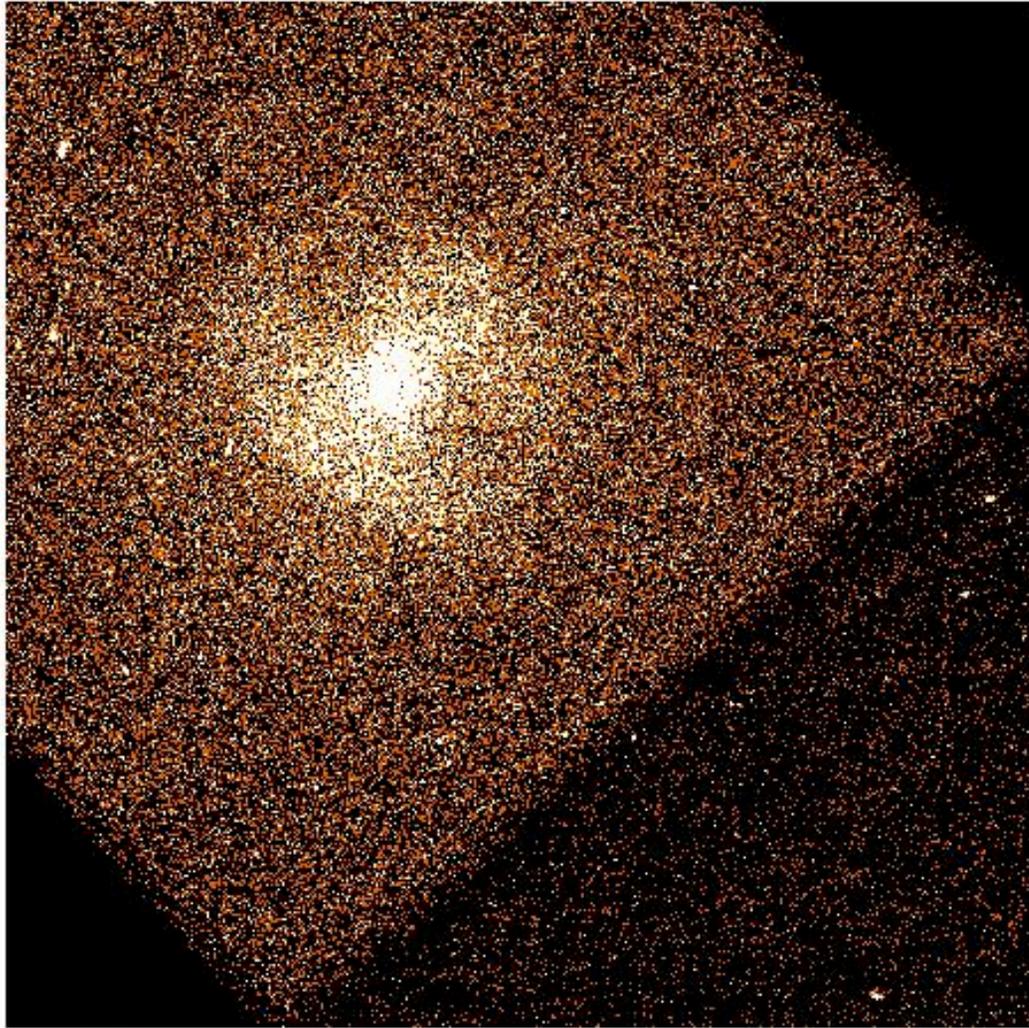
Chandra X-ray image of the NGC 5813 elliptical galaxy



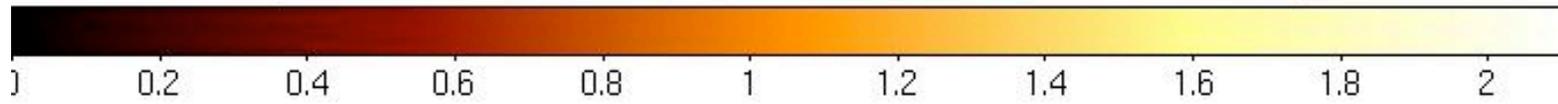
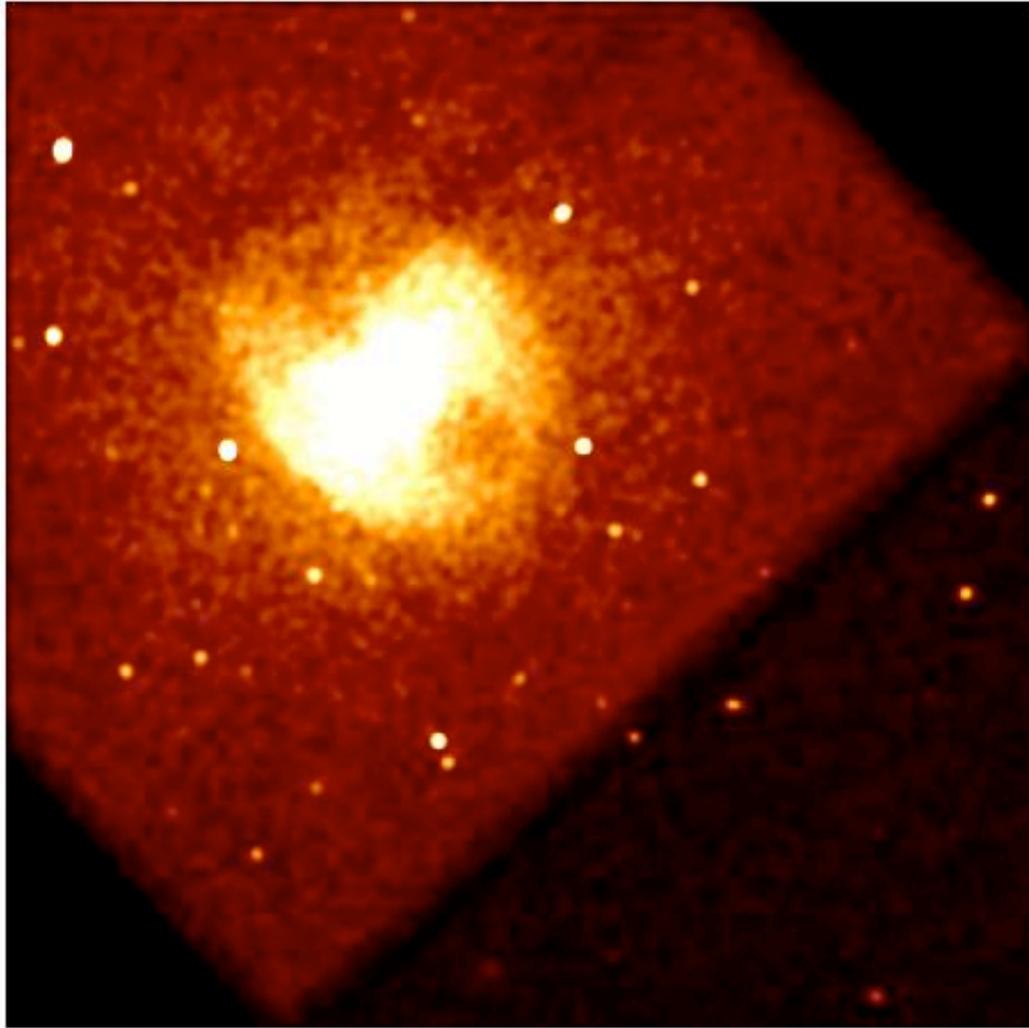
*zoom to fit*



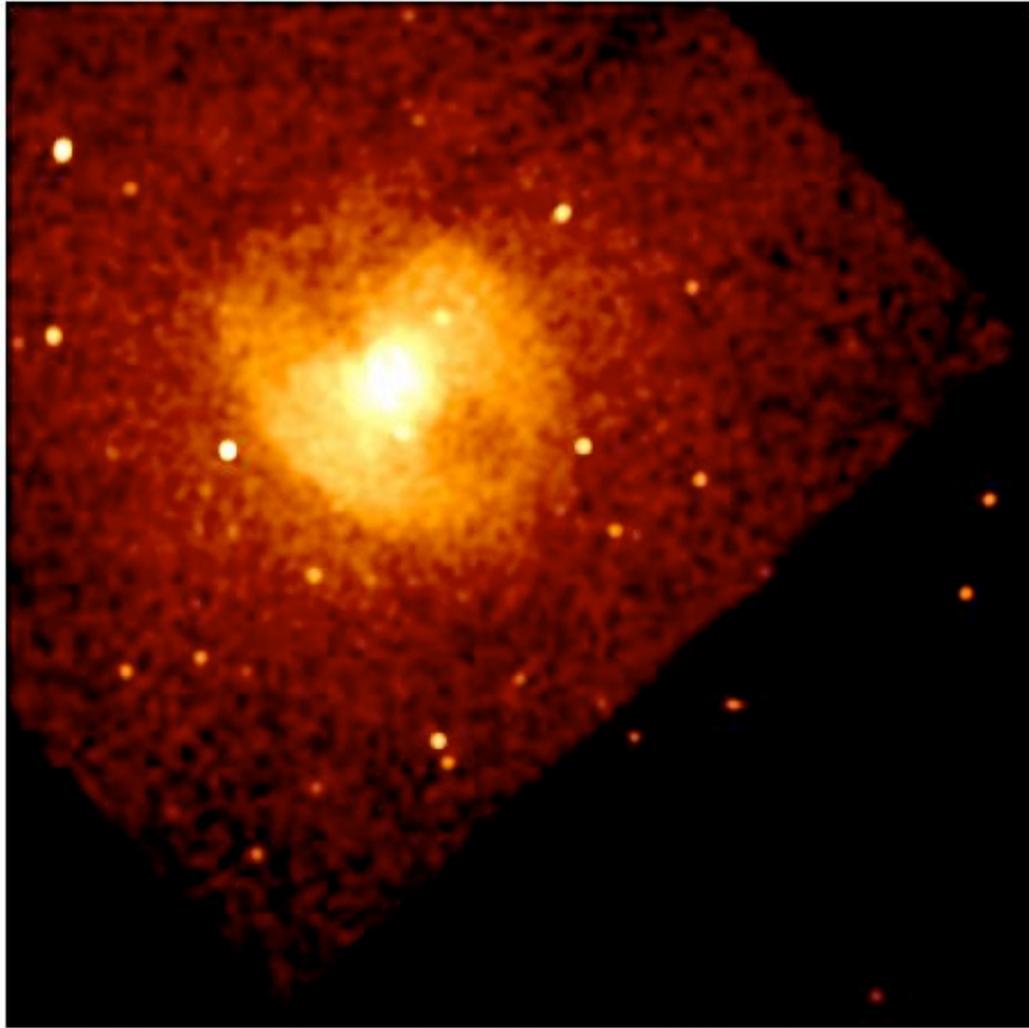
rescale colors using *zscale*



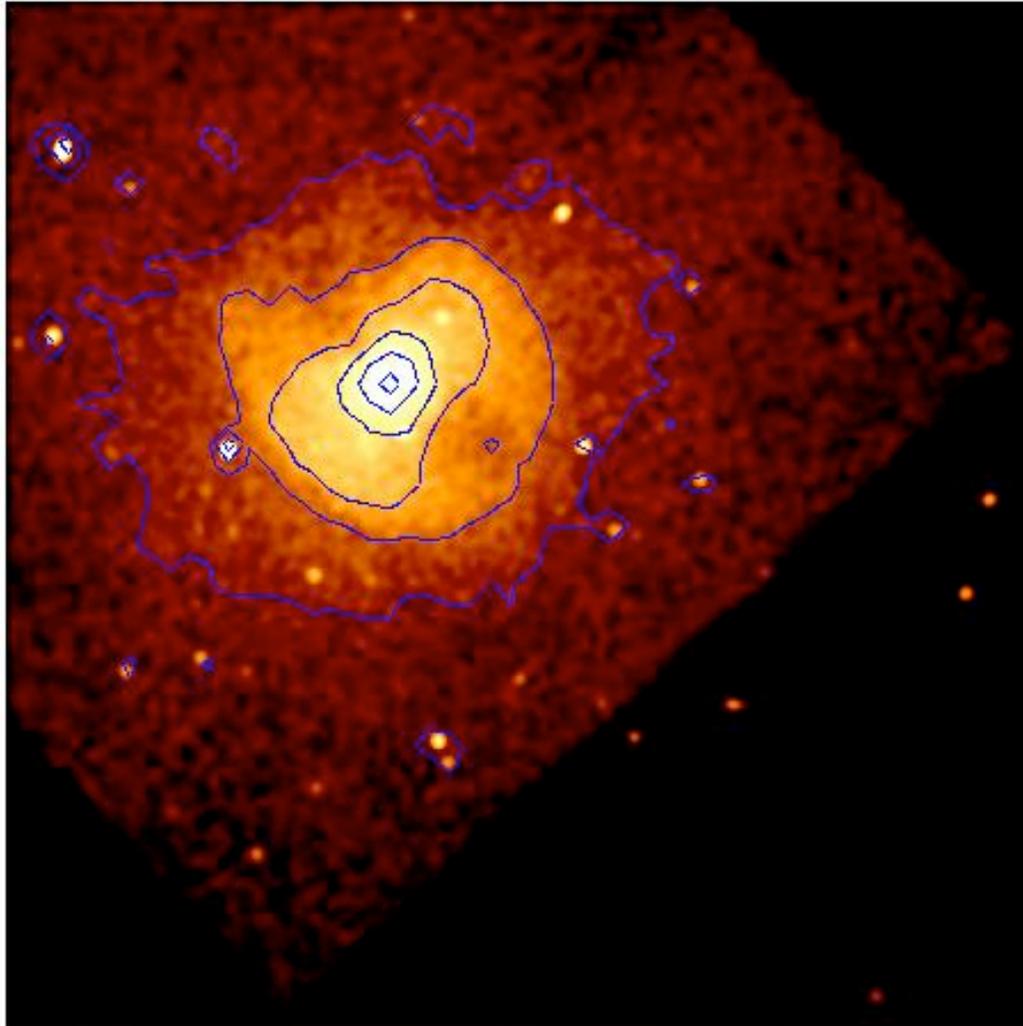
change *color*



smooth [*analysis*  $\rightarrow$  *smooth parameters*]

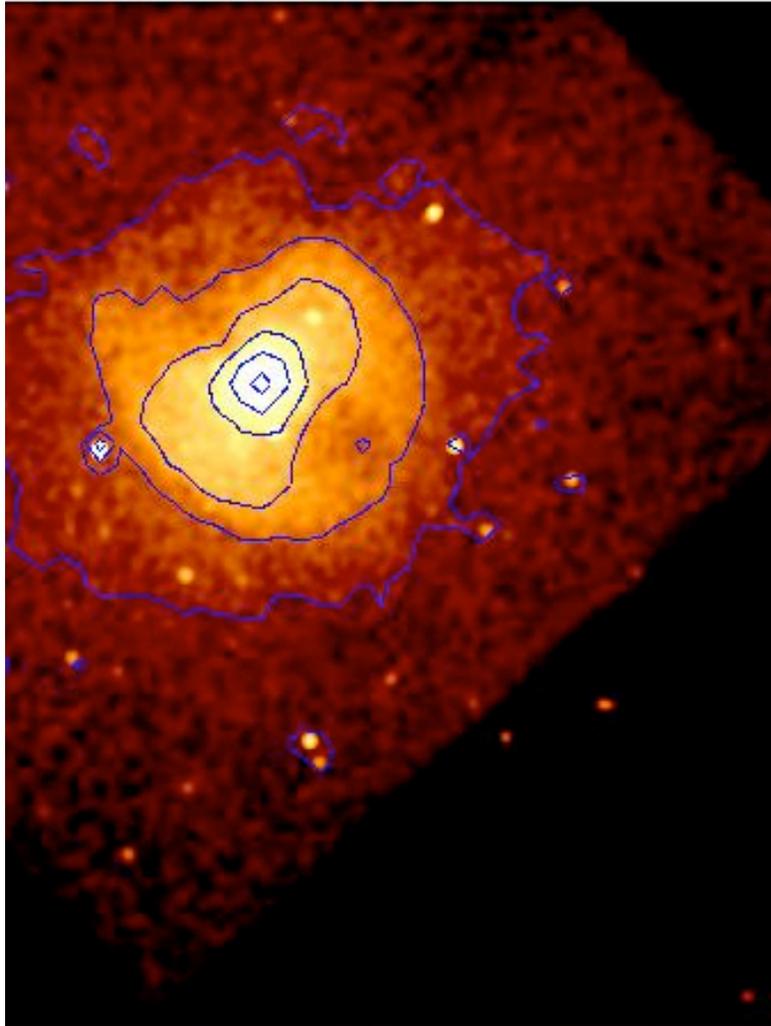


*rescale* colors

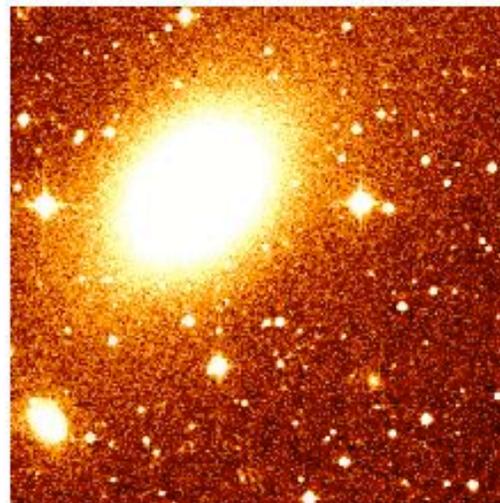
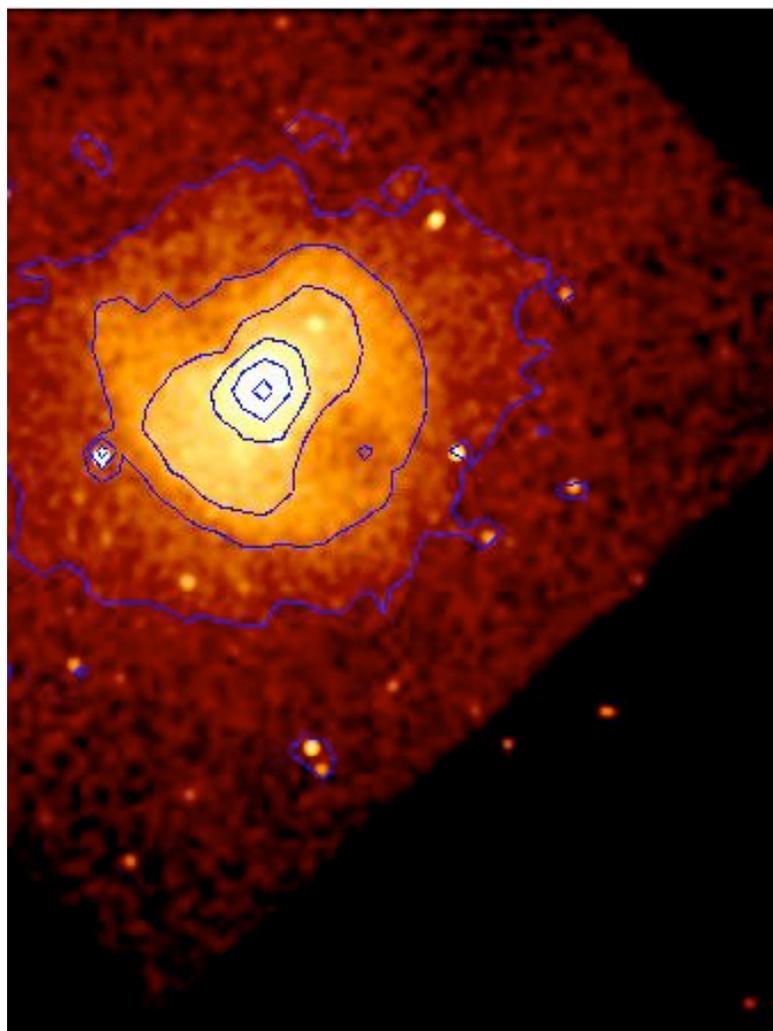


x-ray contours [*analysis* → *contour parameters*]

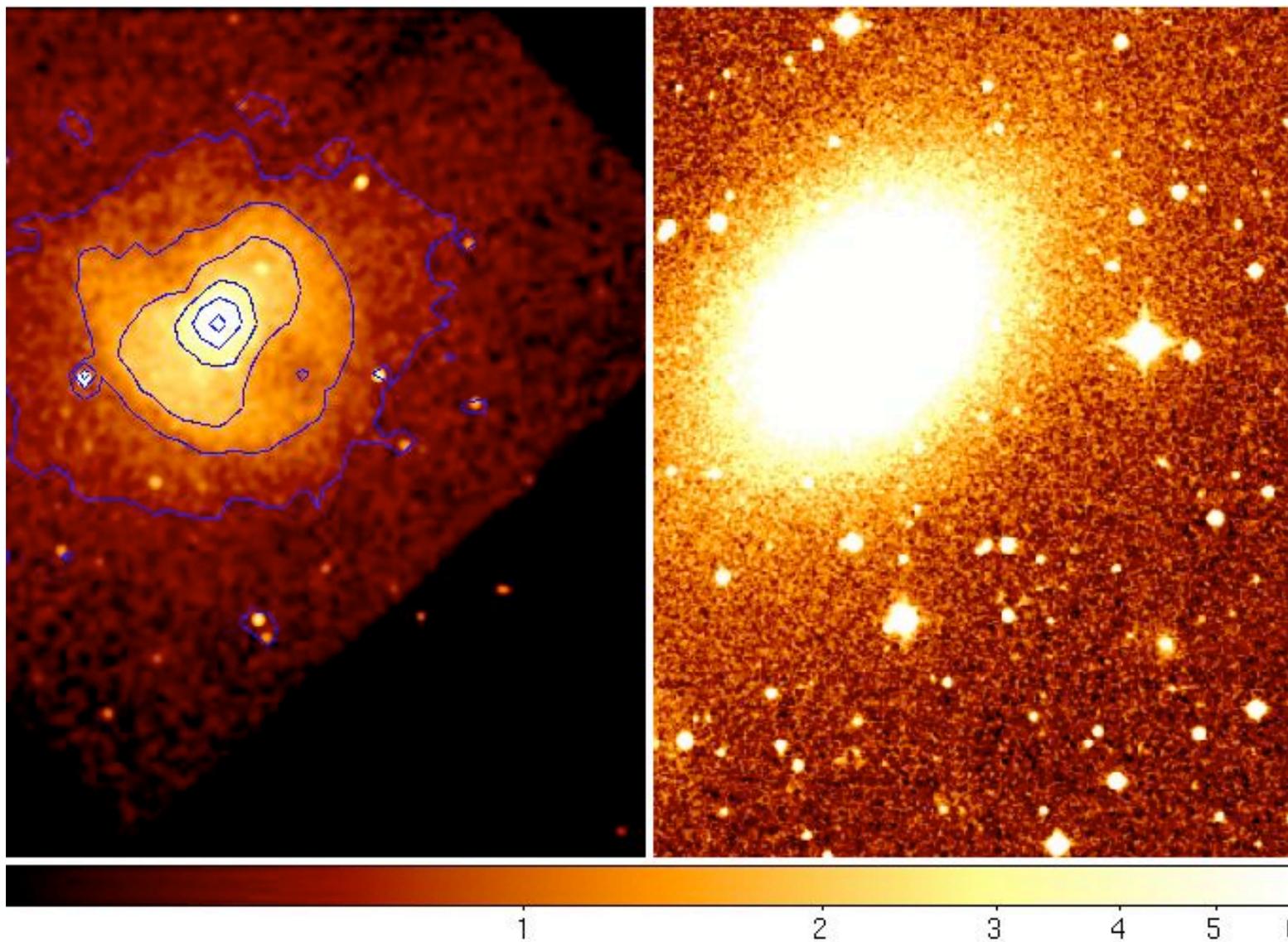
save these in a file [*analysis* → *contour parameters* → *file* → *save contours*]



Load DSS optical image [*analysis* → *image servers* → *STSCI-DSS I/II*] (automatically tiled)

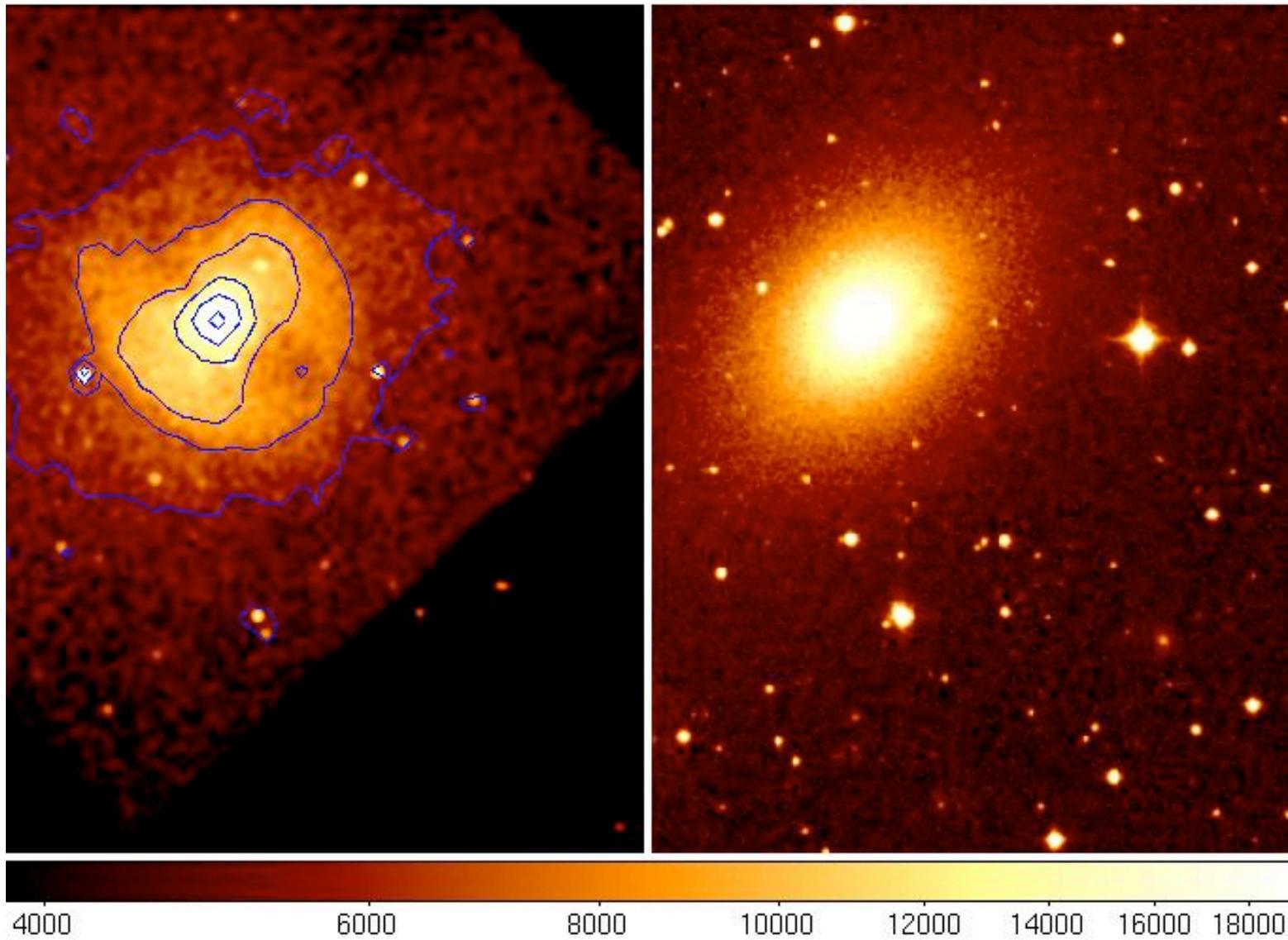


*rescale* colors in optical image

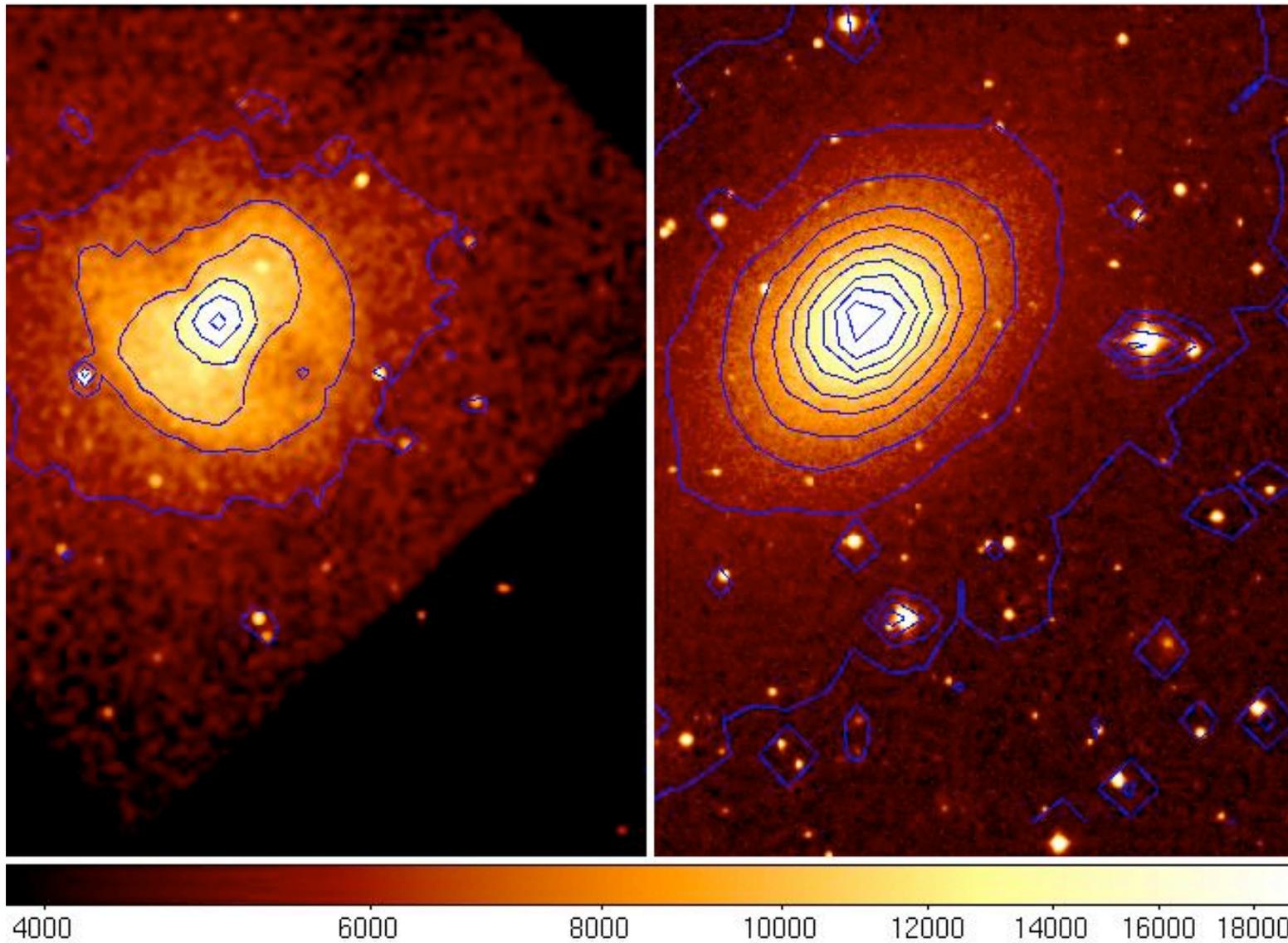


WCS-align images

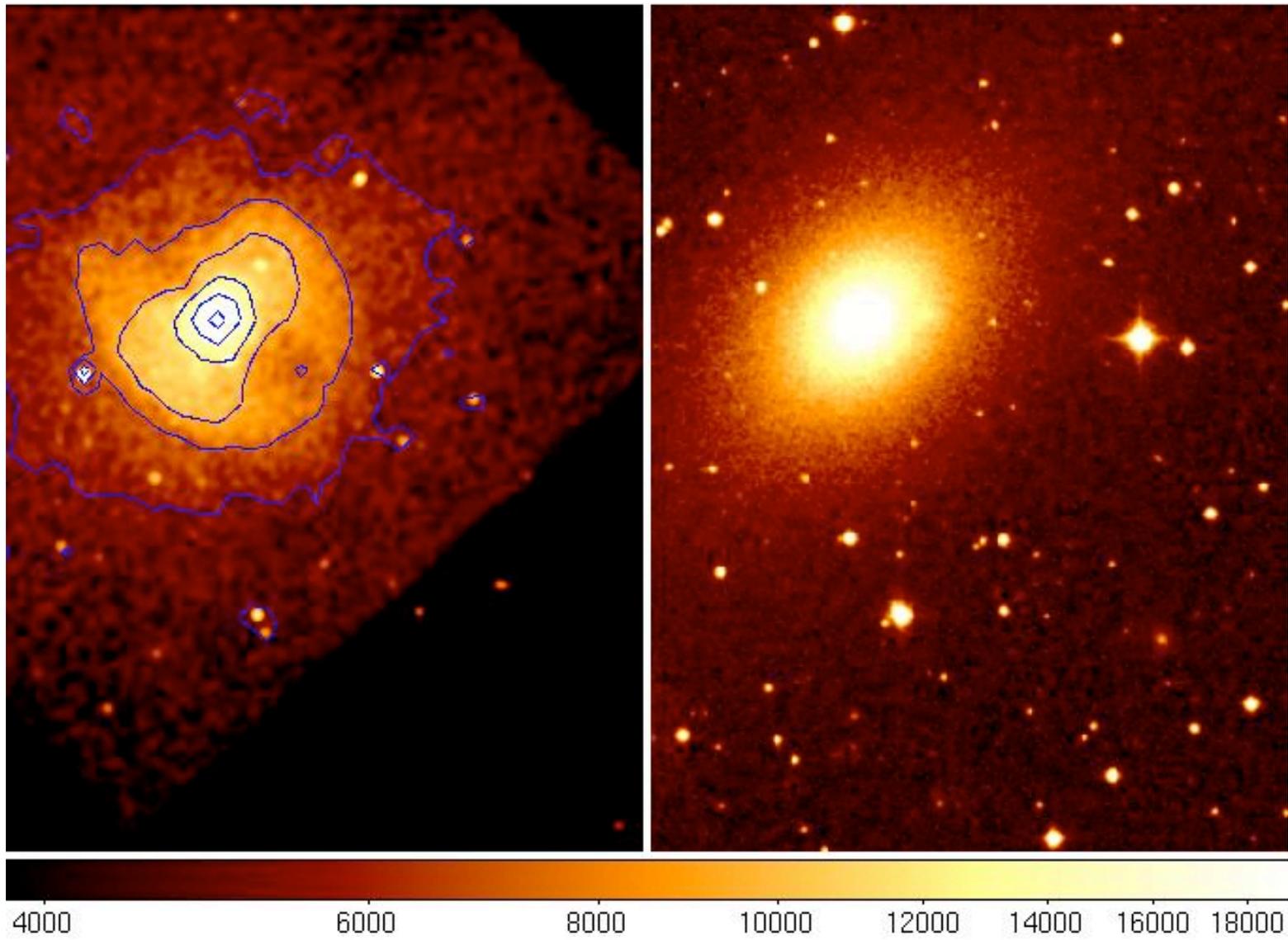
[*Frame* → *Match Frames* → *WCS*]



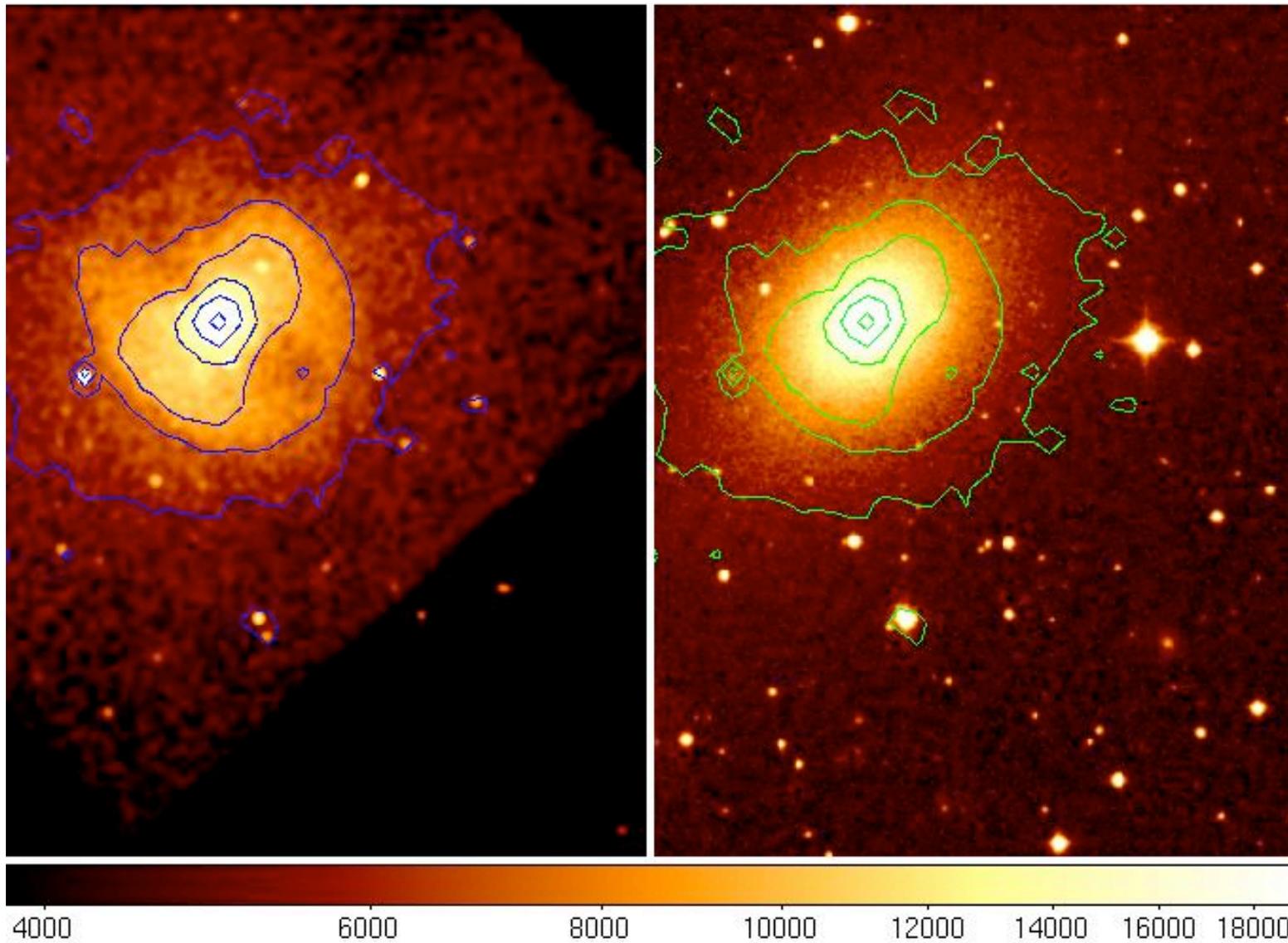
rescale *colors* in optical image



overlay optical contours on optical image



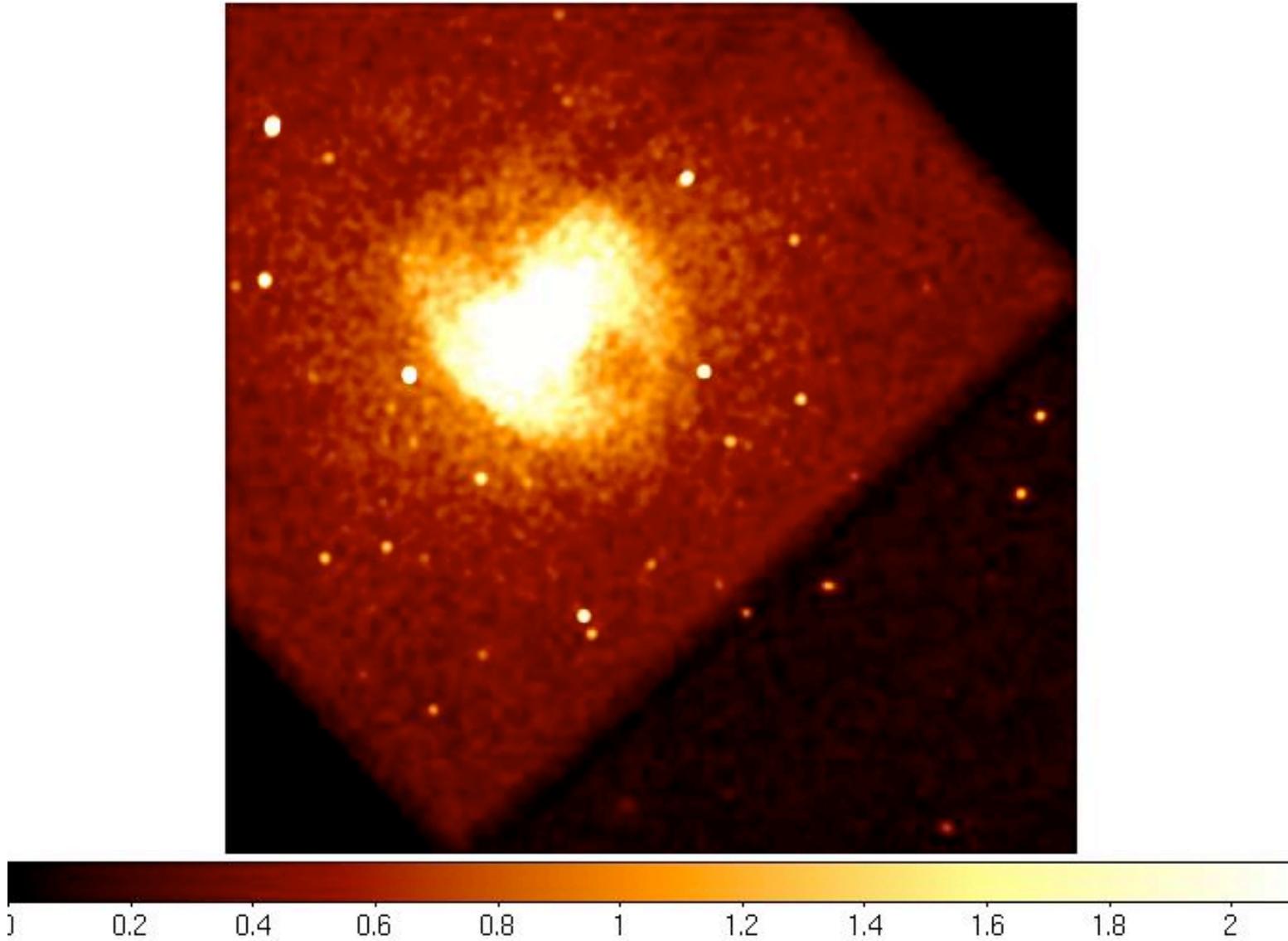
*clear* optical contours



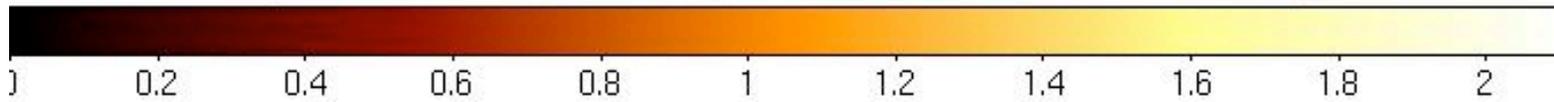
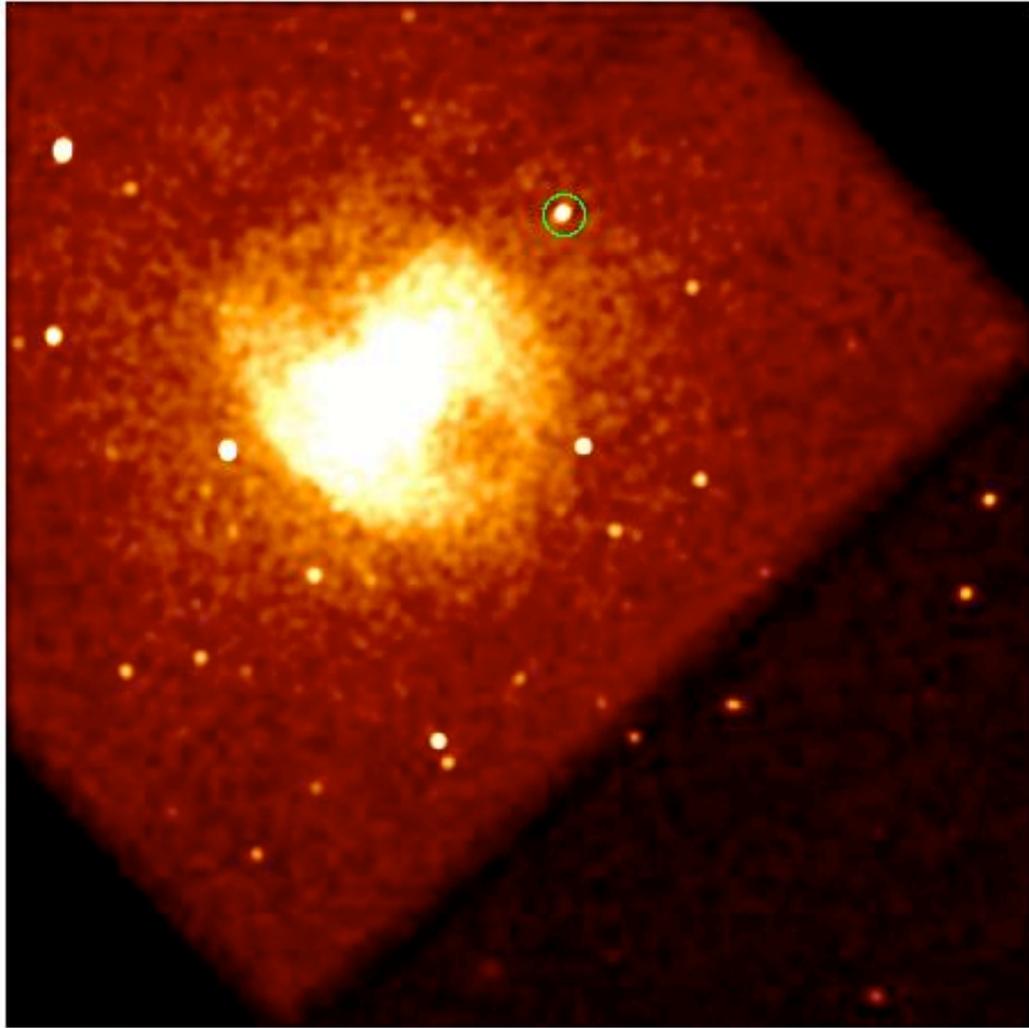
overlay x-ray contours on optical image

[*analysis* → *contour parameters* → *file* → *load contours*]

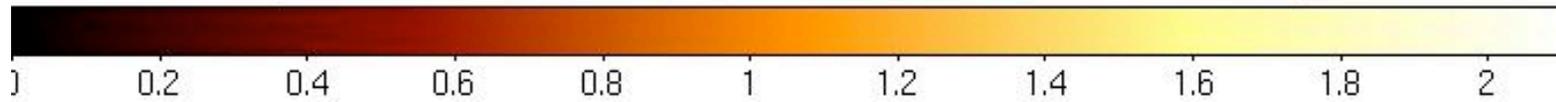
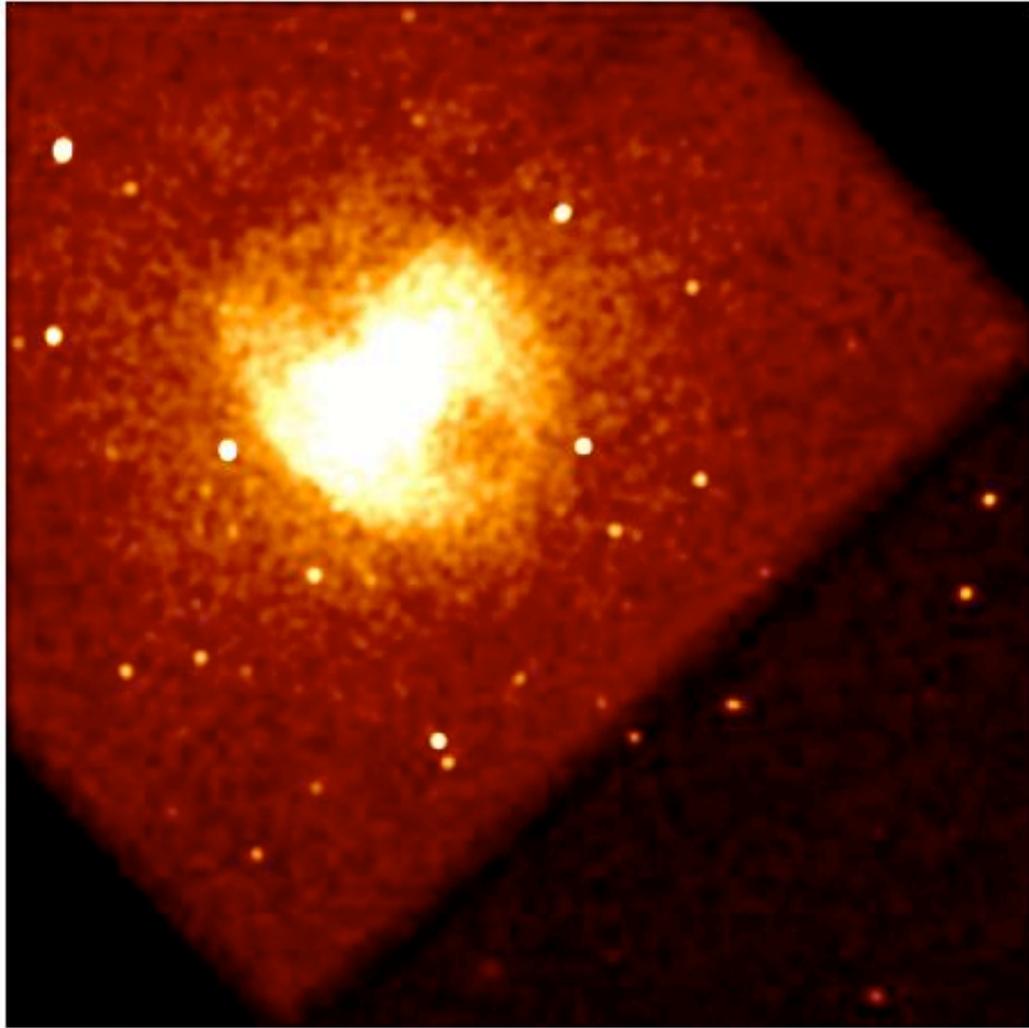
# ***A Quick Look at Regions and Catalogs in DS9***



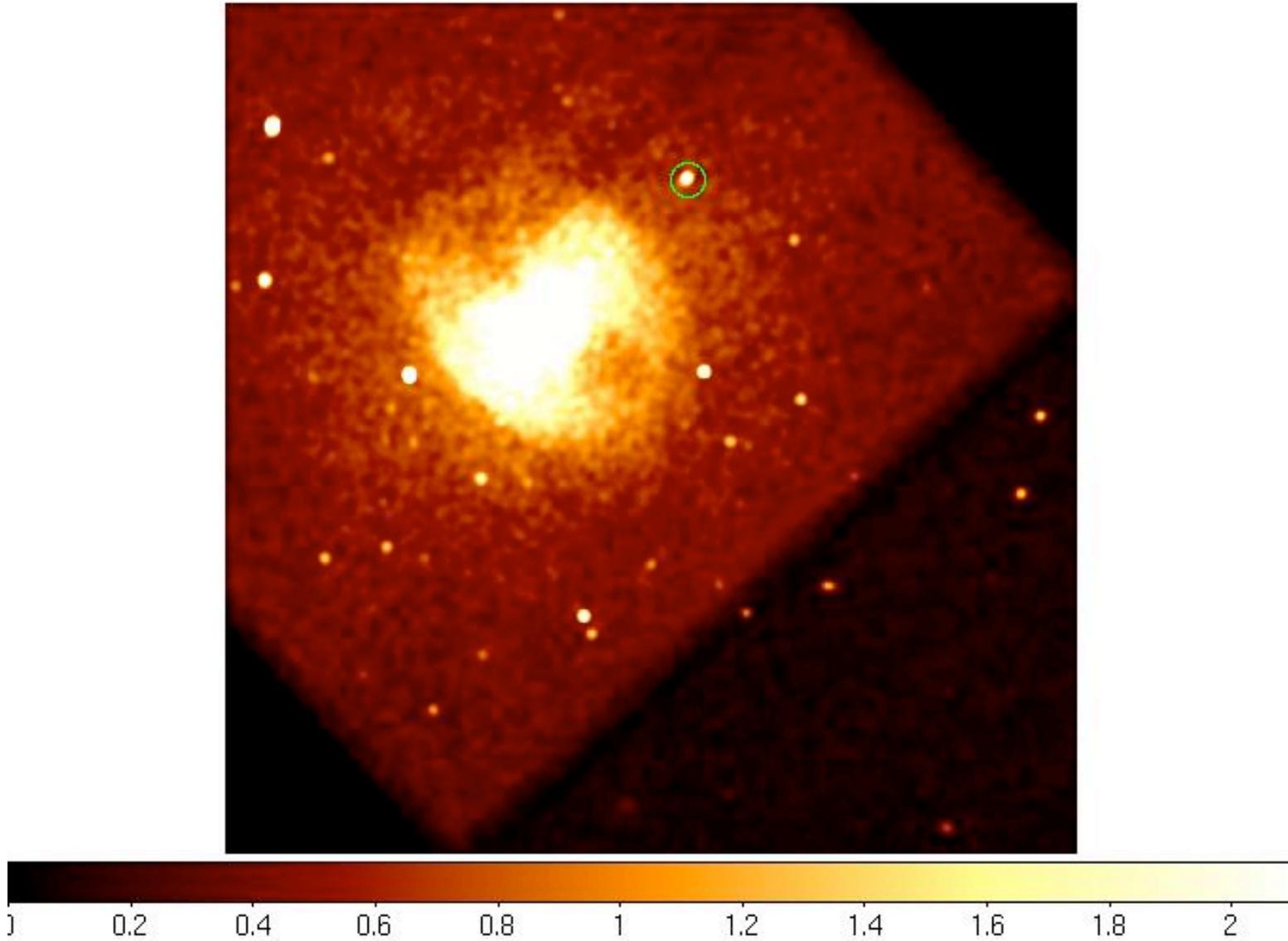
The frame with the smoothed X-ray image,  
contours *cleared*.



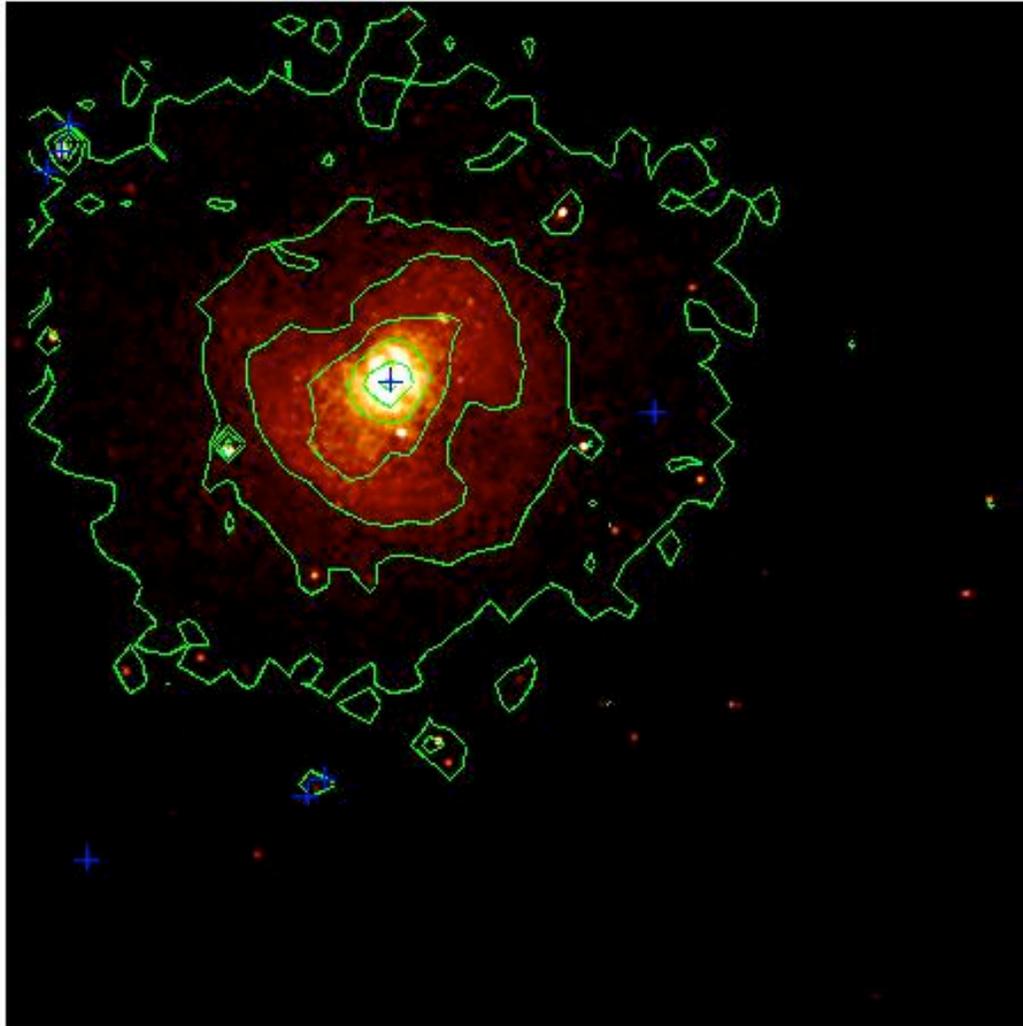
Place a circle (the default *region shape*) around a point source. Adjust the center and radius (to  $10''$ ), and express these in sexagesimal WCS coordinates [*region*  $\rightarrow$  *get information*].



save these in a file [*region* → *save regions*], and then remove from the image [*region* → *delete all regions*]



Reload the saved region [*region*  $\rightarrow$  *load regions*]



Overplot source positions *retrieved* from the FIRST radio survey, using blue cross point symbols [*analysis* → *catalogs* → *radio* → *first survey*]