# *CSCview*
## Chandra Source Catalog
## Data Access GUI



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# Chandra Source Catalog Data Access

The Chandra Source Catalog (CSC) includes <u>point source data</u> extracted from <u>ACIS and HRC imaging (non-grating) data sets</u>, obtained from the start of the mission through the start of 2010.

***Data excluded from the catalog, to be included in future releases:***

- x  *Extended sources which are greater than ~30 arcsec in extent*
- x  *HETG and LETG grating data*

**X-ray <u>spatial,</u> <u>spectral</u>, and <u>temporal</u> source properties may be downloaded through CSCview, many per CSC energy band (u, s, m, h, b, w).**

- ➢ **<u>Source Position</u>**  *equatorial coordinates, off-axis angle*
- ➢ **<u>Source Extent</u>**  *source region, PSF region*
- ➢ **<u>Source Flux</u>**  *aperture photometry and spectral model fit fluxes*
- ➢ **<u>Source Significance</u>**  *flux and detection*
- ➢ **<u>Source Spectral Properties</u>**  *hardness ratios, power-law and blackbody model fit parameters*
- ➢ **<u>Source Variability</u>**  *count rate, Gregory-Loredo, Kolmogorov-Smirnov, and Kuiper's variability probability*
- ➢ **<u>Source Flags</u>**  *is the source variable? saturated? confused with another source?*
- ➢ **<u>Observation Summary</u>**  *instrument configuration, data processing*

# Chandra Source Catalog Data Access

*You can also download analysis-ready data files through CSCview:*

**Source region**

*events table & img*

*pha spectrum*

*ARF*

*RMF*

*exposure map*

*PSF*

*light curve*

 *region*

**Full-field**

*events table & img*

*background image*

*exposure map*

*sensitivity map*

*aspect histogram*

*bad pixel*

*field-of-view*



Light Curve
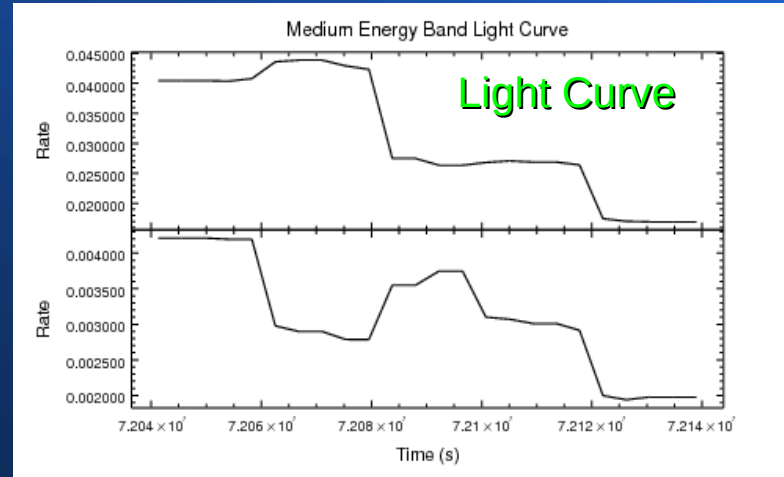


Source and background events and spatial region



Full-field events and field-of-view spatial region



Source counts spectrum
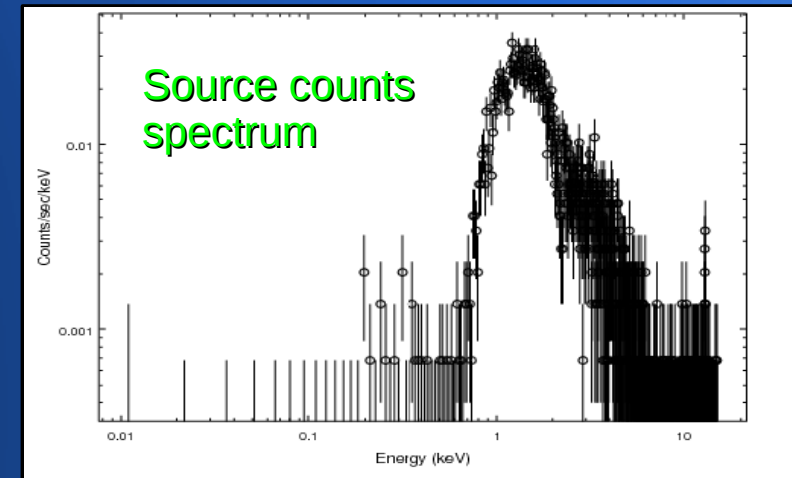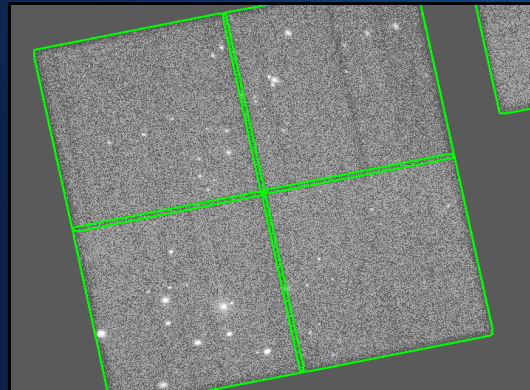
# *CSCview* User Interface

## Graphical User Interface (GUI)

*CSCview, a Java applet which runs in a web browser*
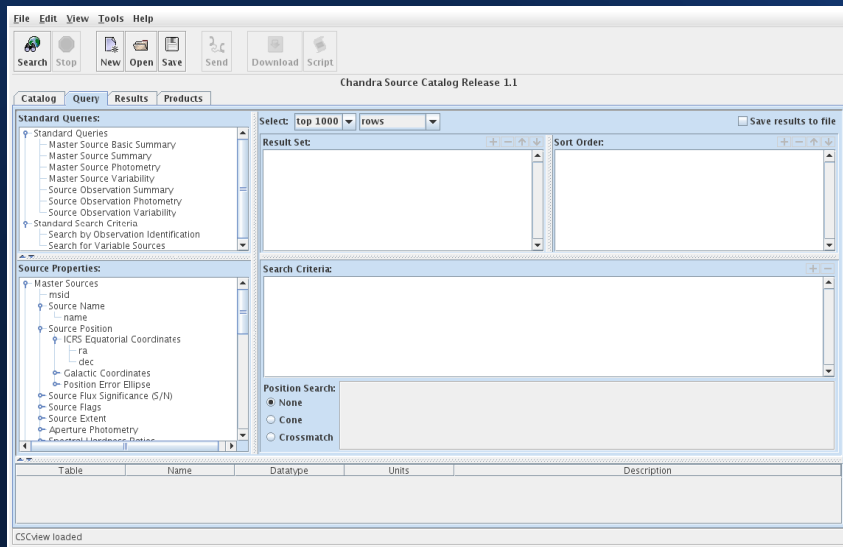
## Command-line Interface (CLI)

*Non-interactive access from the Unix command line using*
## *cURL, Wget, …*



```
Terminal
unix% curl –form query='SELECT m.name, m.ra,
 m.dec, m.flux_aper_b, FROM master_source m
 WHERE dbo.cone_distance(m.ra, m.dec, 83.7733,
 -5.68464)<=10' http://cda.cfa.harvard.edu/getProperties

unix% wget –O out.file
'http://cda.cfa.harvard.edu/csccli/getProperties?
query=SELECT m.name, m.ra, m.dec, m.flux_aper_b
FROM master_source m WHERE
dbo.cone_distance(m.ra,m.dec,83.77333,-5.68464)<=10'
```

# Launching *CSCview*

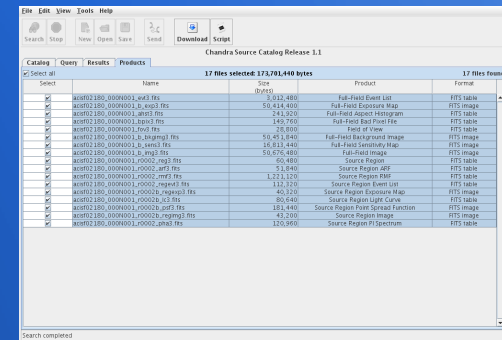*http://cxc.harvard.edu/csc/*
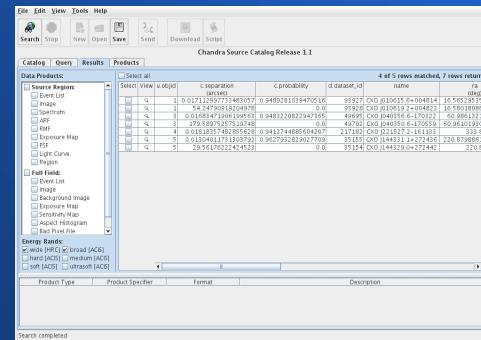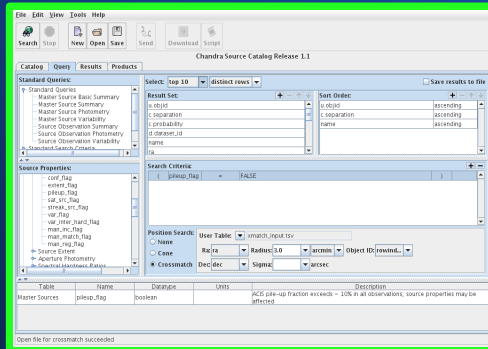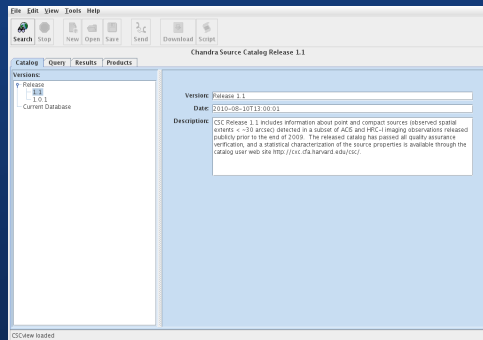
# *CSCview* opens on the Query tab
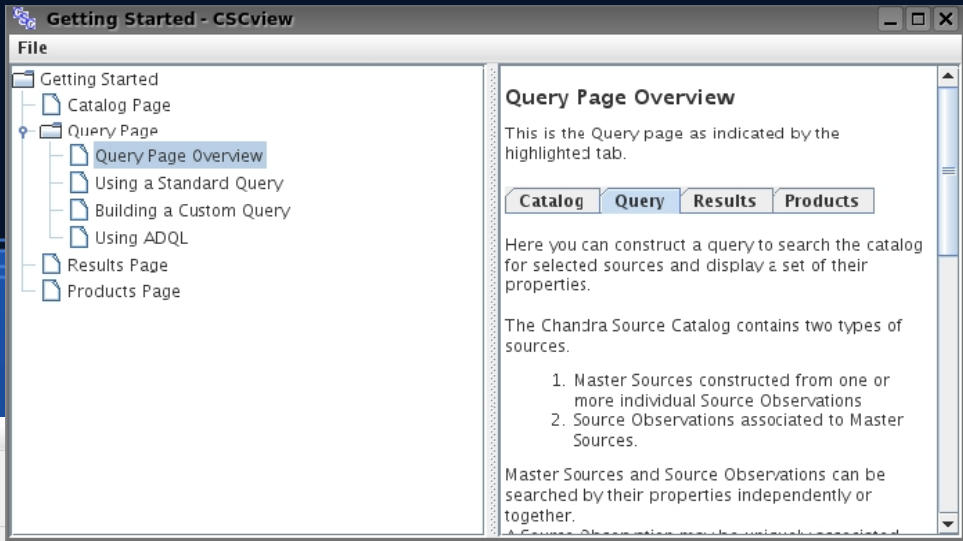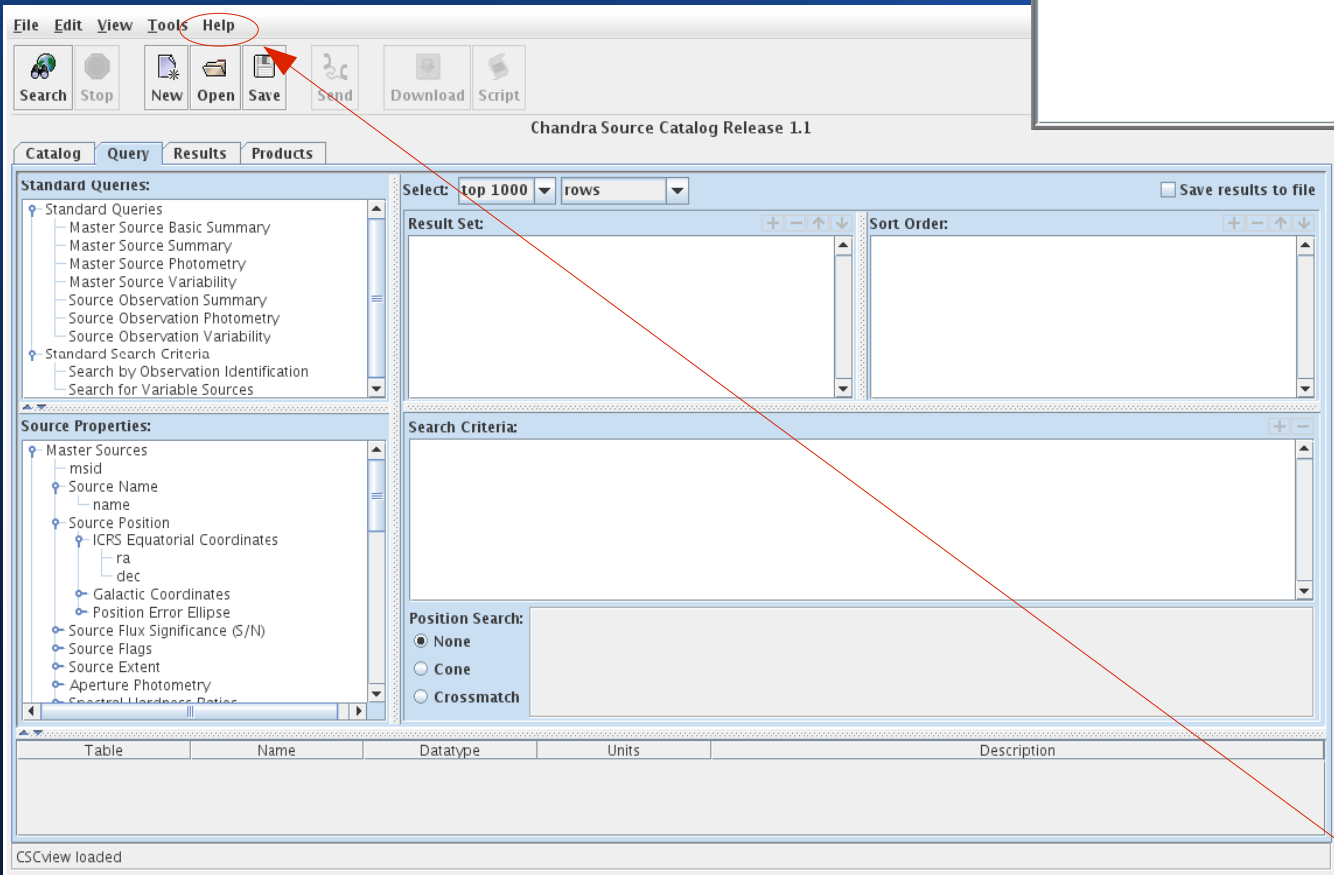


*The **Getting Started** guide pops up alongside the GUI to help you construct queries; separate help documents are available on the CSC website, linked to the Help menu:*
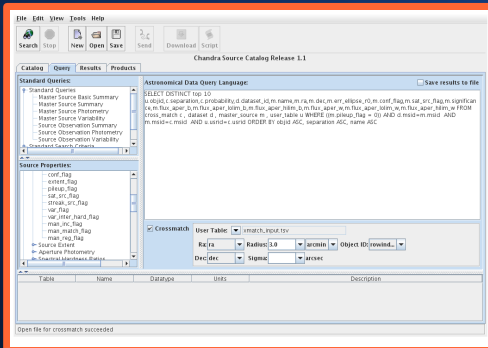
**http://cxc.harvard.edu/csc/gui/**

# *CSCview* tabs

## Catalog tab → Query tab → Results tab → Products tab



**Choose a "view"** of the catalog to access, either a *release view* or the *current database view.*



**Submit a query** interactively or using command-line syntax.

**Save the search results** to a text file in TSV or VOTable format.

**Download data files** such as light curves, spectra, and event files, in FITS table, FITS image, and JPG image format.

# *CSCview* <u>Catalog</u> tab



(2) ***Click "Search"***

File   Edit   View   Tools   Help

Search   Stop   New   Open   Save   Send   Download   Script

Chandra Source Catalog Release 1.1

Catalog   Query   Results   Products

**Versions:**

- Release
  - 1.1
  - 1.0.1
- Current Database

**Version:** Release 1.1

**Date:** 2010-08-10T13:00:01

**Description:** CSC Release 1.1 includes information about point and compact sources (observed spatial extents < ~30 arcsec) detected in a subset of ACIS and HRC-I imaging observations released publicly prior to the end of 2009. The released catalog has passed all quality assurance verification, and a statistical characterization of the source properties is available through the catalog user web site http://cxc.cfa.harvard.edu/csc/.

*(1) **Choose "Release 1.1" or "Current Database view."***

<u>Release view</u>:  carefully reviewed, well-characterized, static version of the CSC.

<u>Current Database view</u>:  dynamic but unstable version of the CSC; source properties and data products can be superseded at any time, and statistical properties of data are not guaranteed.

CSCview loaded

# *CSCview* Query tab

**Submit, clear, load, and save queries.**

**Use these buttons instead of a mouse cursor to move source properties around.**

View  Tools  Help

Search  Stop  New  Open  Save  Send  Download  Script

Chandra Source Catalog Release 1.1

Catalog | **Query** | Results | Products

**Standard Queries:**

Select: [all ▾]  [distinct rows ▾]  ☐ Save results to file

Standard Queries
- Master Source Basic Summary
- Master Source Summary
- Master Source Photometry
- Master Source Variability
- Source Observation Summary
- Source Observation Photometry
- Source Observation Variability

Standard Search Criteria
- Search by Observation Identification
- Search for Variable Sources

**Result Set:** [＋] [－][↑][↻]   **Sort Order:** [＋][－][↑][↓]

| u.objid | | u.objid | ascending |
| c.separation | | | |
| c.probability | | | |
| name | | | |
| ra | | | |
| dec | | | |
| err_ellipse_r0 | | | |

**Build a custom query:**

**Use the provided source properties to specify your desired results and optional search conditions.**

**Source Properties:**
- Galactic Coordinates
- Position Error Ellipse
- Source Flux Significance (S/N)
- Source Flags
  - conf_flag
  - extent_flag
  - pileup_flag
  - sat_src_flag
  - streak_src_flag
  - var_flag
  - var_inter_hard_flag
  - man_inc_flag
  - man_match_flag
  - man_reg_flag

**Search Criteria:**

| ( | pileup_flag | = | FALSE | |

**Position Search:**
- ○ None
- ○ Cone
- ● Crossmatch

User Table: [▾] user_table

Ra: [col1 ▾]  Radius: [3.0 ▾] arcmin  Object ID: [rowind... ▾]

Dec: [col2 ▾]  Sigma: [1.0 ▾] arcsec

**Create New Table**  □ ✕

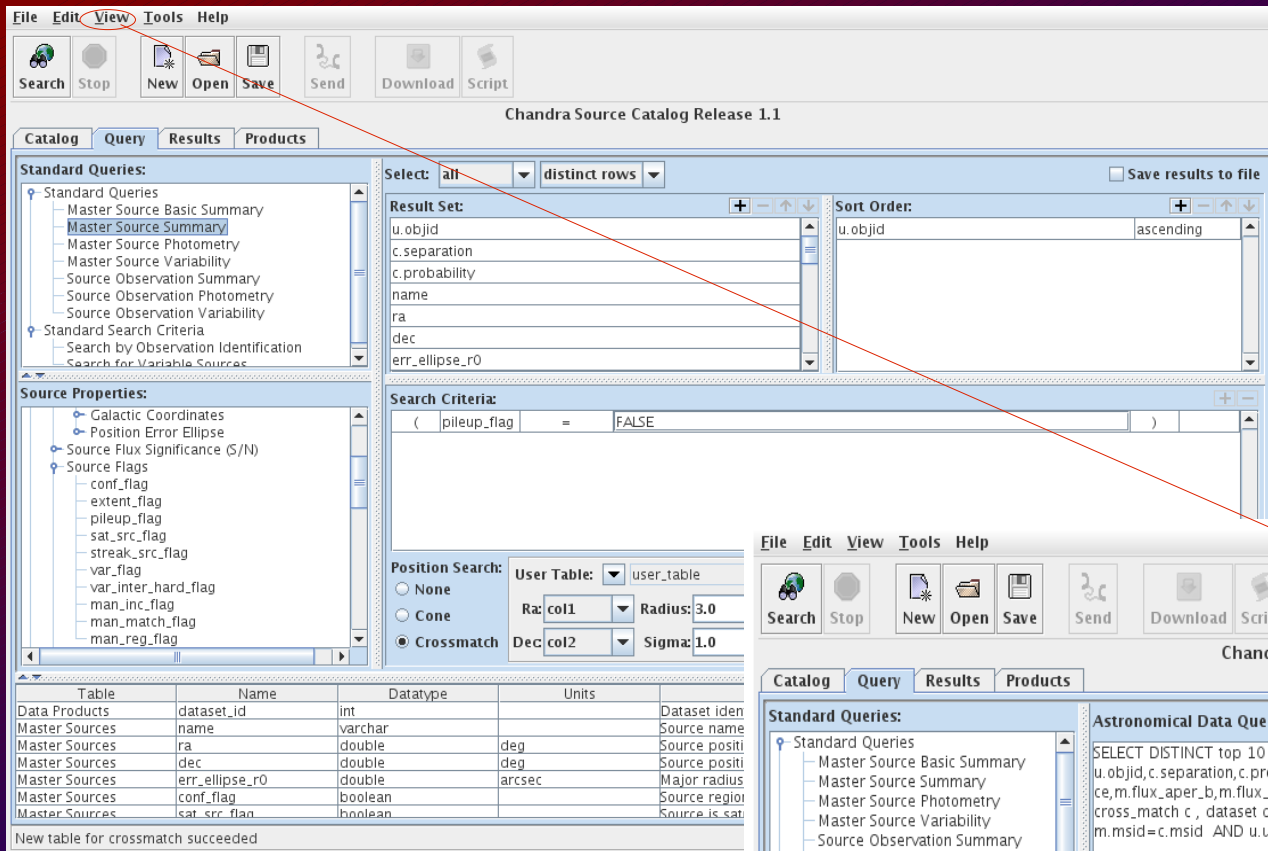*Each column must be separated by a tab.*  [Clear]

```
16.56530    0.80412
41.00765   -15.6776
60.98613   -17.05616
333.86372  -16.19251
220.87989   27.41019
```

[OK]  [Cancel]

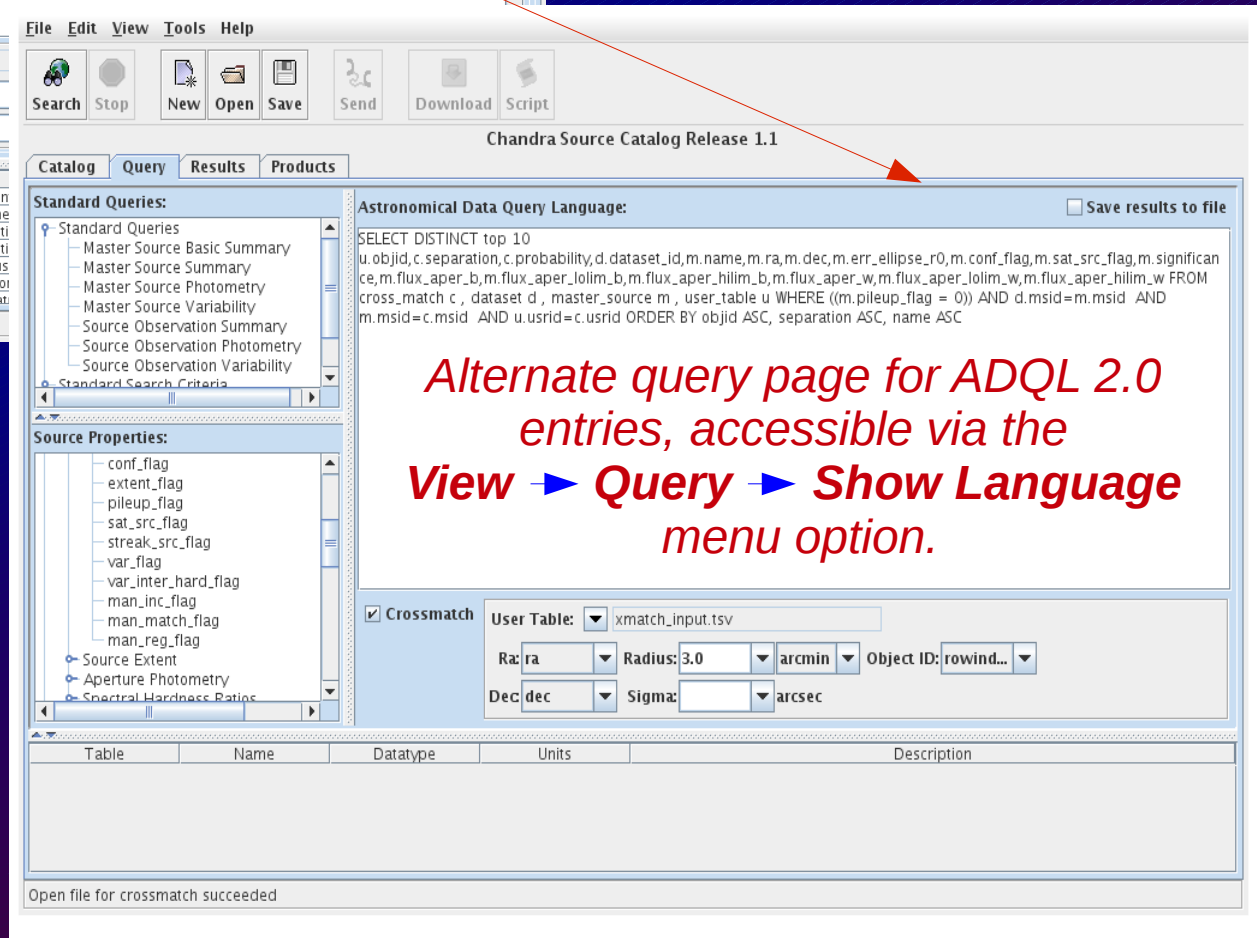| Table | Name | Datatype | Units | Description |
|---|---|---|---|---|
| Data Products | dataset_id | int | | Dataset identifier used to access Data Products |
| Master Sources | name | varchar | | Source name in the format 'CXO Jhhmmss.s +/- ddmmss' |
| Master Sources | ra | double | deg | Source position, ICRS right ascension |
| Master Sources | dec | double | deg | Source position, ICRS declination |
| Master Sources | err_ellipse_r0 | double | arcsec | Major radius of the 95% confidence level error ellipse |
| Master Sources | conf_flag | boolean | | Source regions overlap (source is confused) |
| Master Sources | sat_src_flag | boolean | | Source is saturated in all observations; source properties are unr... |

New table for crossmatch succeeded

*Search with a **Standard Query** by choosing one from the list and dragging it towards the right.*

*Enter a list of source positions to cross-match against the CSC.*

*CSCview* Query tab

Enter a query in the *main view* of the Query tab and see its ADQL 2.0 translation in the *"language" view.*

Alternate query page for ADQL 2.0 entries, accessible via the *View ► Query ► Show Language* menu option.

# *CSCview* <u>Query</u> tab → *ADQL view*

# *CSCview* <u>Results</u> tab



*After the query is submitted, the <u>Results tab</u> opens with a table of search results; each row represents a source, and each column a selected property characterizing the source.*

# *CSCview* Results tab

# CSCview Results tab

# *CSCview* Products tab



List of data products requested in the Results tab.

Download a single *tar file* containing the selected data products, OR

Retrieve a *download script* containing a list of Wget commands – one for each data file – to be executed on the Unix command line for a batch download.

# Troubleshooting
## *Why can't I find my source?*

**The source is in the catalog, but your search criteria are too strict:**

*Have you set a flux threshold unrealistically high, or used a very small cone search radius in a search on source position?*

**Try relaxing or reducing the number of search conditions and re-submit your query.**

**The source is not in the catalog:**

**\*** *The source did not pass quality assurance filters for inclusion in the catalog; e.g., the signal-to-noise was too low, or the source flux was fainter than the Chandra limiting sensitivity.*

**Learn more here:** *http://cxc.harvard.edu/csc/faq/src_inclusion.html*

**\*** *The source was observed by Chandra but the CCD on which it lies was excluded from the catalog because it contains extended emission.*
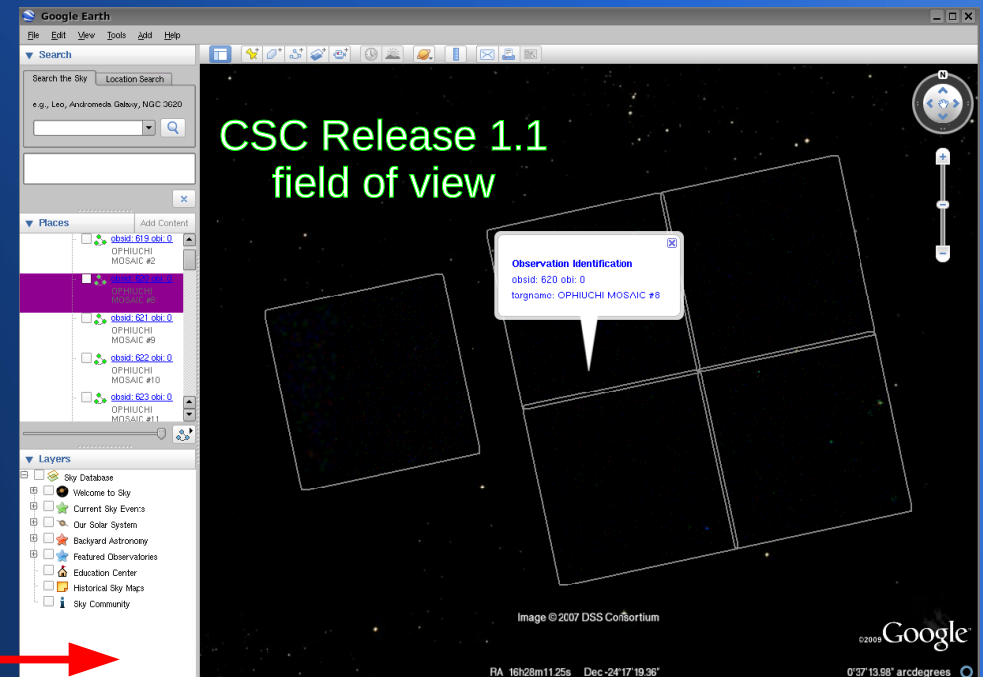
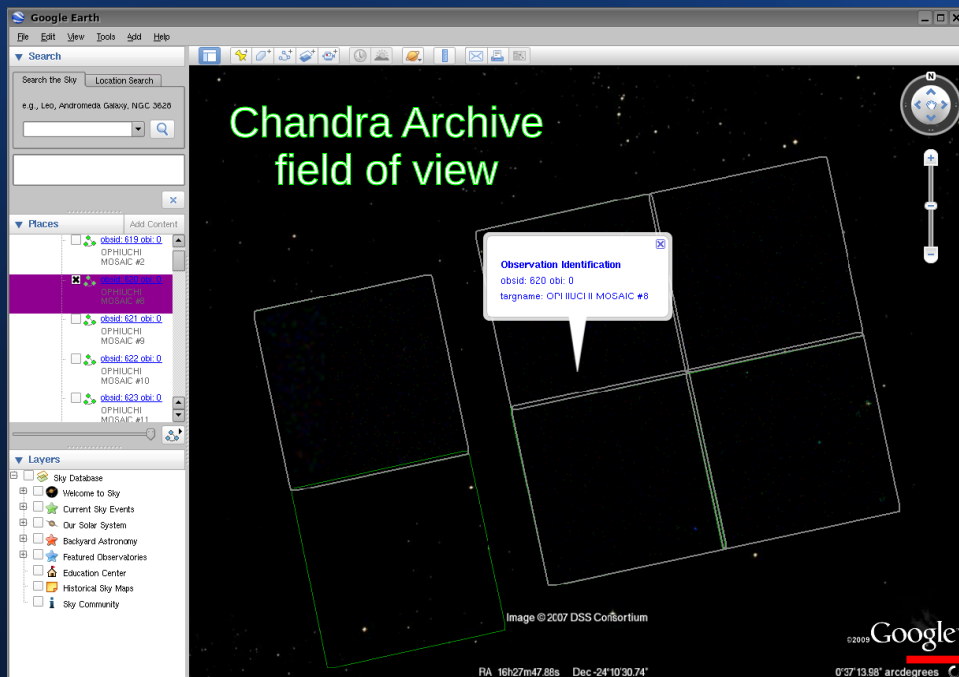**If you know the ObsID, check for it in the list of "dropped chips" for CSC Release 1.1:**
*http://cxc.harvard.edu/csc/faq/dropped_chips.html*

# Troubleshooting
## *Why can't I find my source?*

**Search for your source in the <u>CSC interface to Sky in Google Earth</u>,
where you can visually inspect Chandra observations for dropped chips.**

*http://cxc.harvard.edu/csc/googlecat/*



*dropped chip*

# CSC Resources
*http://cxc.harvard.edu/csc/*

## Refer to the CSC website for:

* step-by-step *CSCview* and data analysis tutorials;

* high-level descriptions of source properties and data files included in the catalog;

* answers to frequently asked questions;

* *How & Why* topics;

* catalog science requirements and specifications; and

* a thorough summary of the catalog statistical characterization.

Submit questions to the

**CXC Helpdesk**

*http://cxc.harvard.edu/helpdesk*