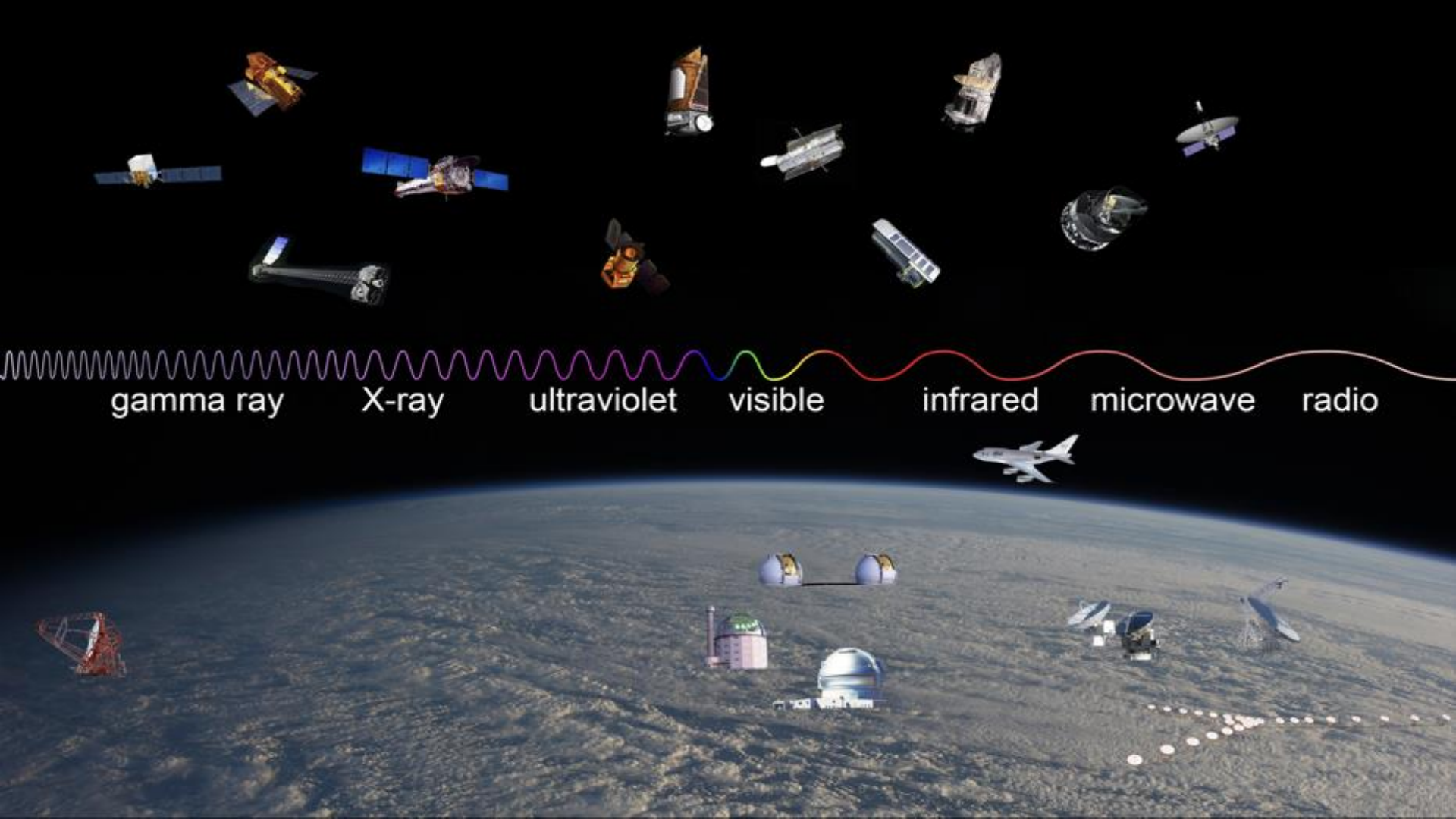
CHANDRA SOURCE CATALOG

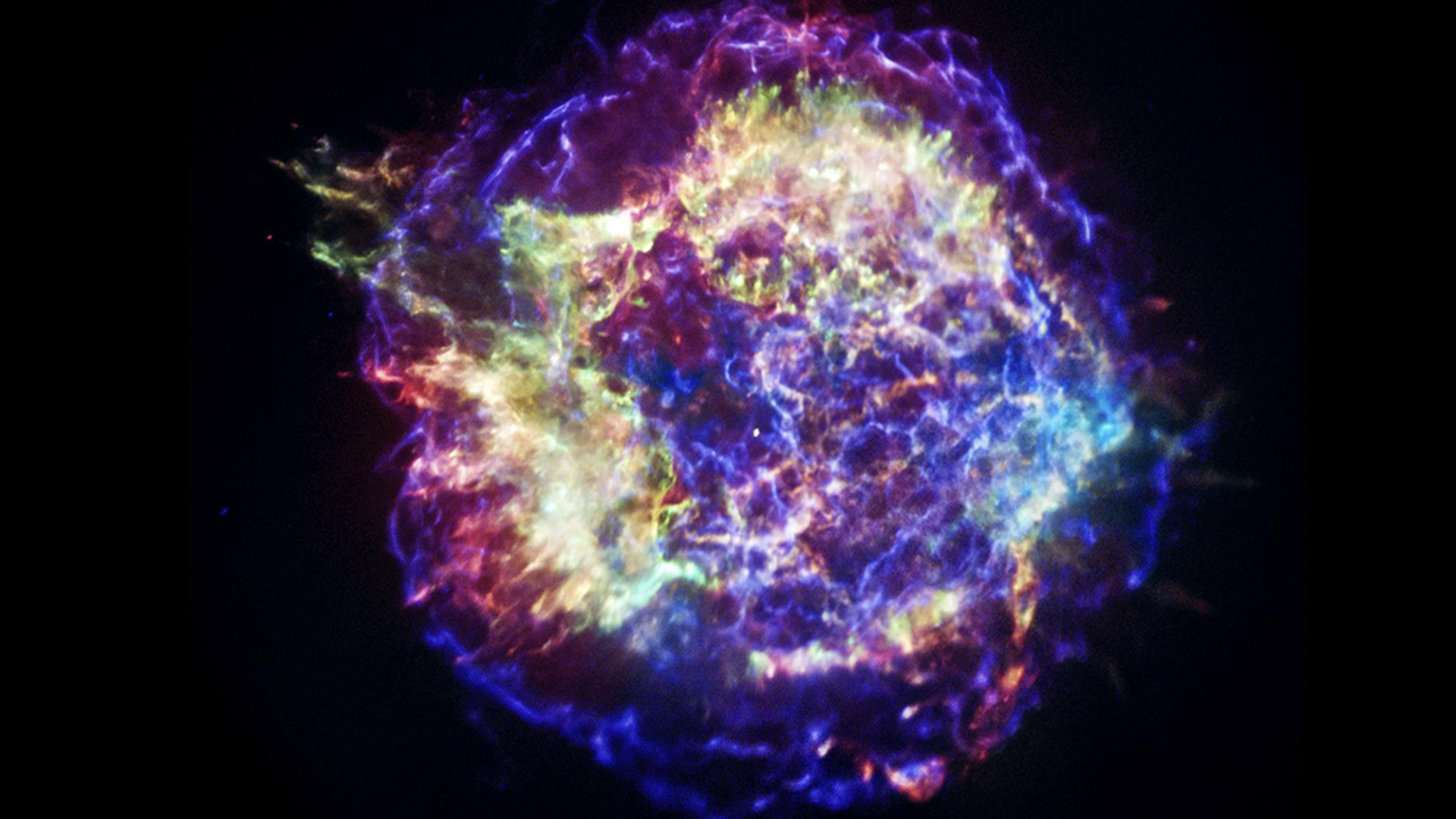
A new view of the X-ray Sky through the Virtual Observatory

Janet Evans, Ian Evans, and the CSC team

Chandra X-ray Observatory

July 23, 1999

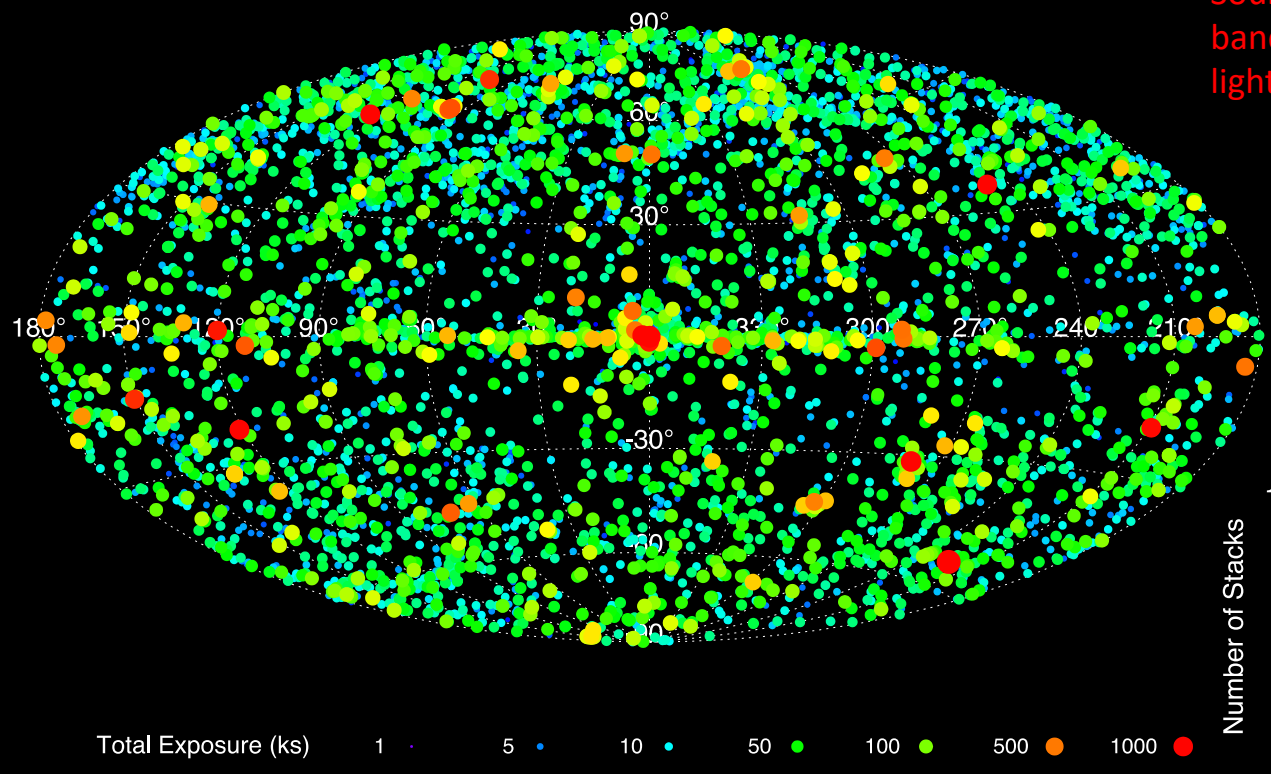

gamma ray
X-ray
ultraviolet
visible
infrared
microwave
radio



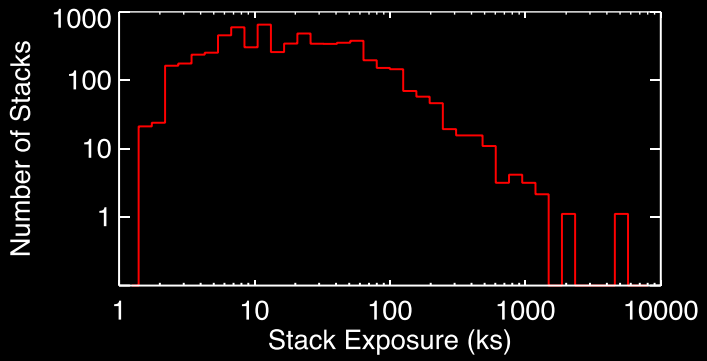
Chandra Source Catalog Release 2

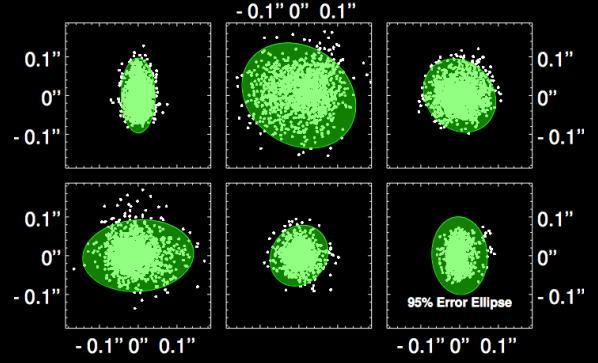
Mining the high-resolution X-ray sky

Source positions, calibrated photons, multi-band X-ray photometry, images, spectra, and light-curves

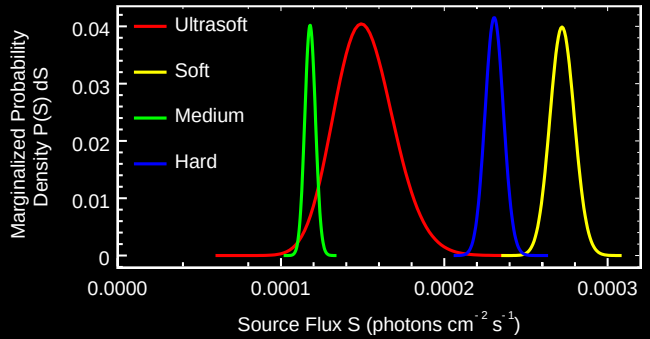


10,382	observations (data sets)
374,349	X-ray detections
315,875	unique X-ray sources on the sky
245.8	Ms total exposure
5.8	Ms longest stacked exposure

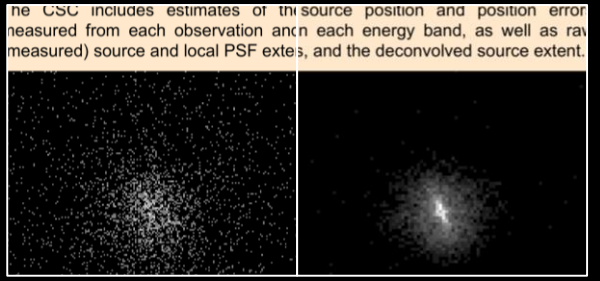




Source position with error ellipses computed from MCMC analysis



Multi-band X-ray aperture photometry with Bayesian probability density functions

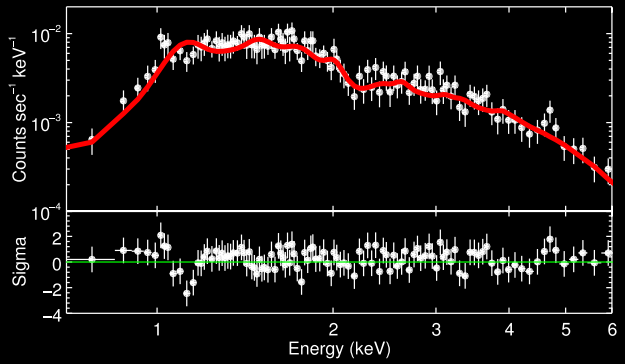


Source extent and local PSF models for every source and energy band

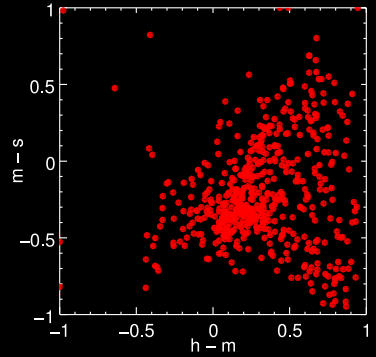
Source properties — all have associated upper and lower confidence bounds

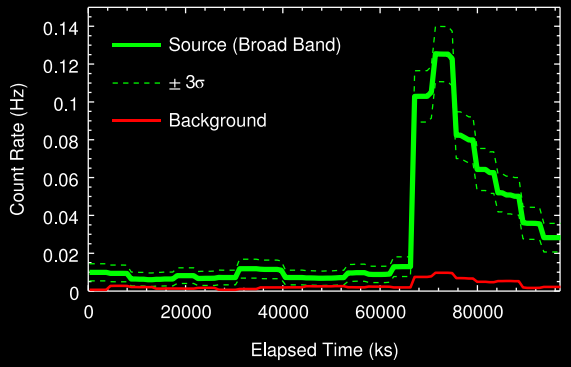
Several source temporal variability measures within a single Observation of a source and between multiple observations that include the same source

Spectral model fits and fluxes determined using multiple models

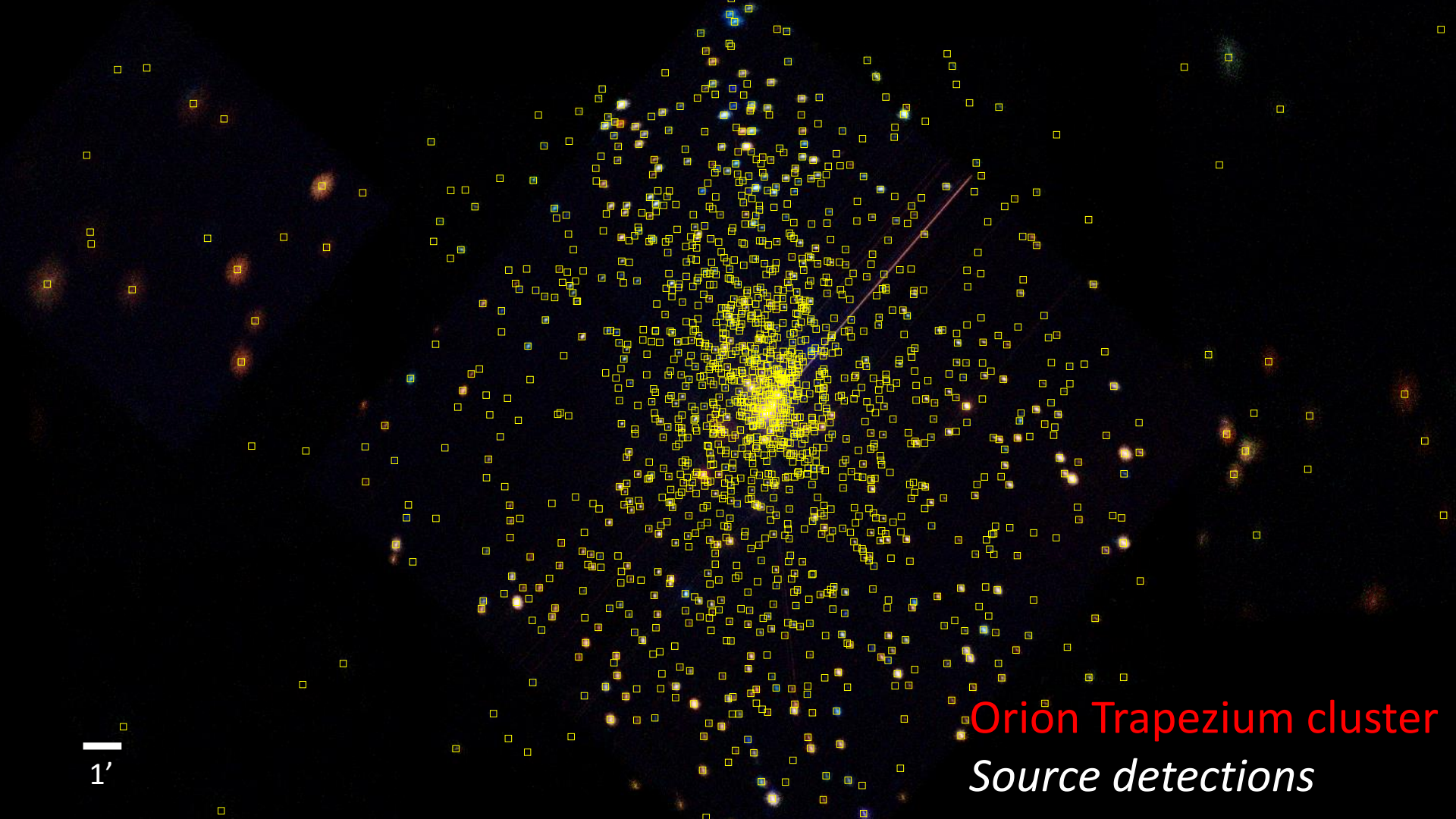


Cross-band spectral Hardness ratios for all detected sources

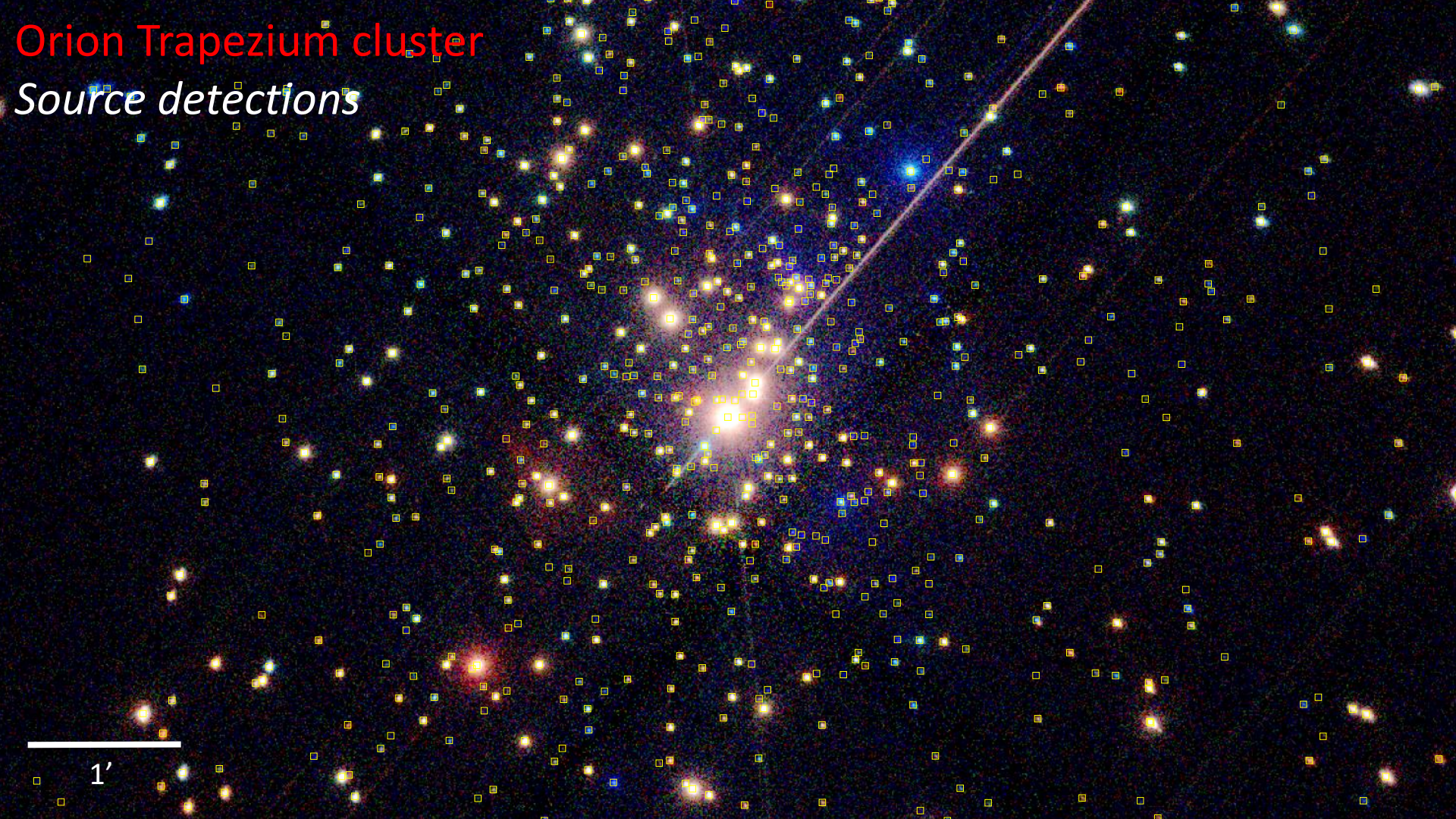





1’
Orion Trapezium cluster


1’
Orion Trapezium cluster
Source detections


1’

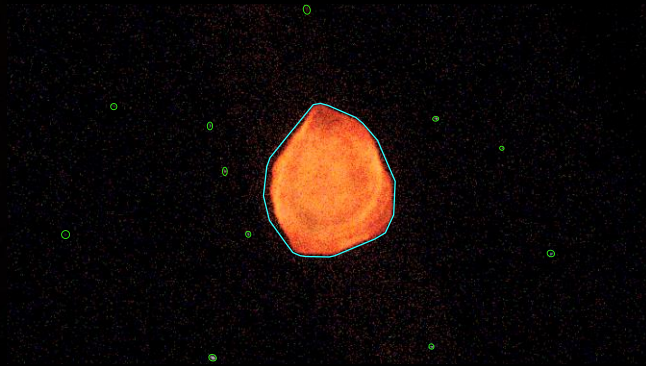

Orion Trapezium cluster
Source detections
1’

Release 2 of the catalog includes extended X-ray emission in addition to point and compact sources

Left: Tycho's supernova remnant (888 ks; 58 million X-ray photons!)

Below: Supernova remnant DEM L71

Large extended sources are identified by enclosing them in a convex hull polygon (cyan below). Position is the flux weighted centroid of the polygon.



Chandra Deep Field South

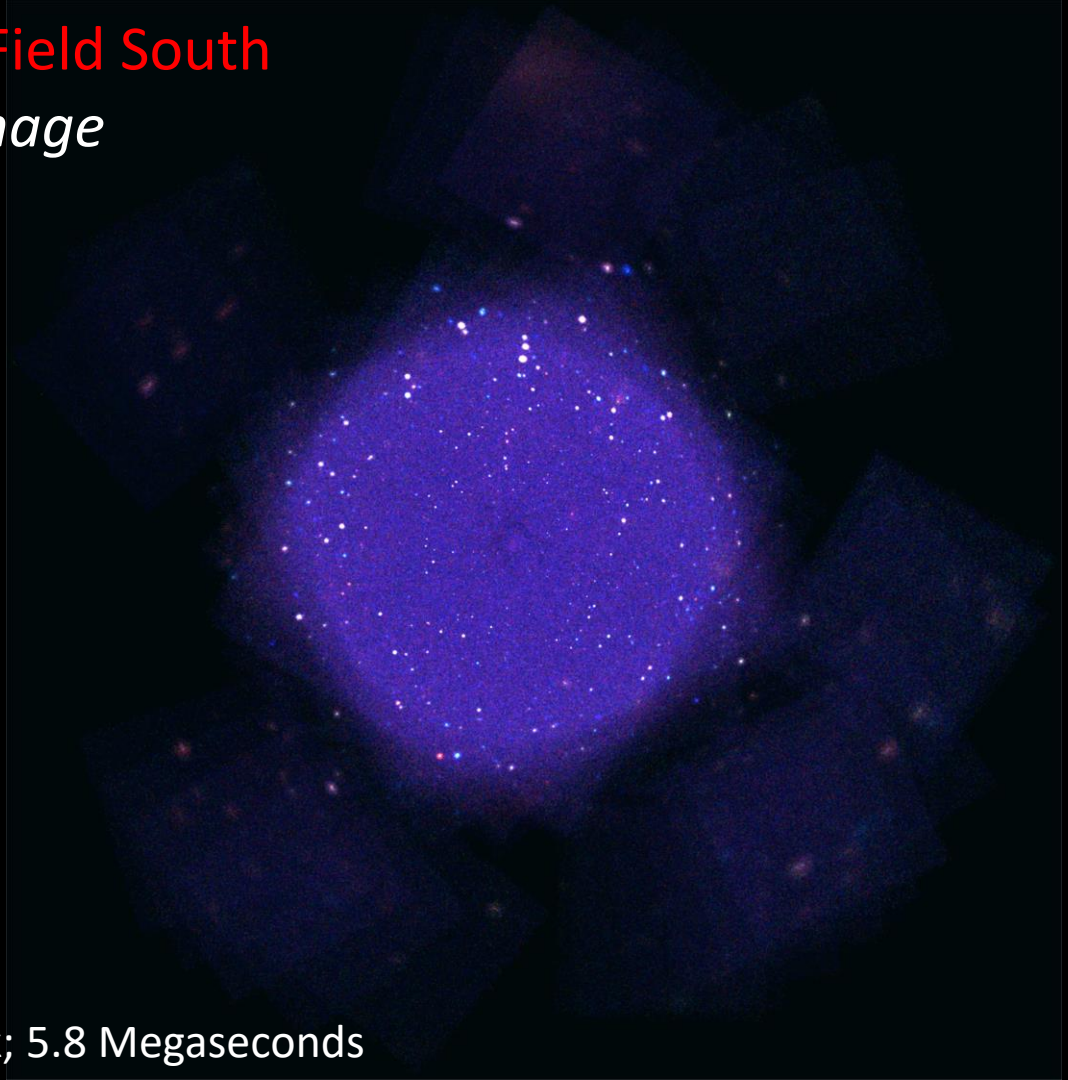
Single observation

Chandra Deep Field South

Growing the observation stack

Chandra Deep Field South

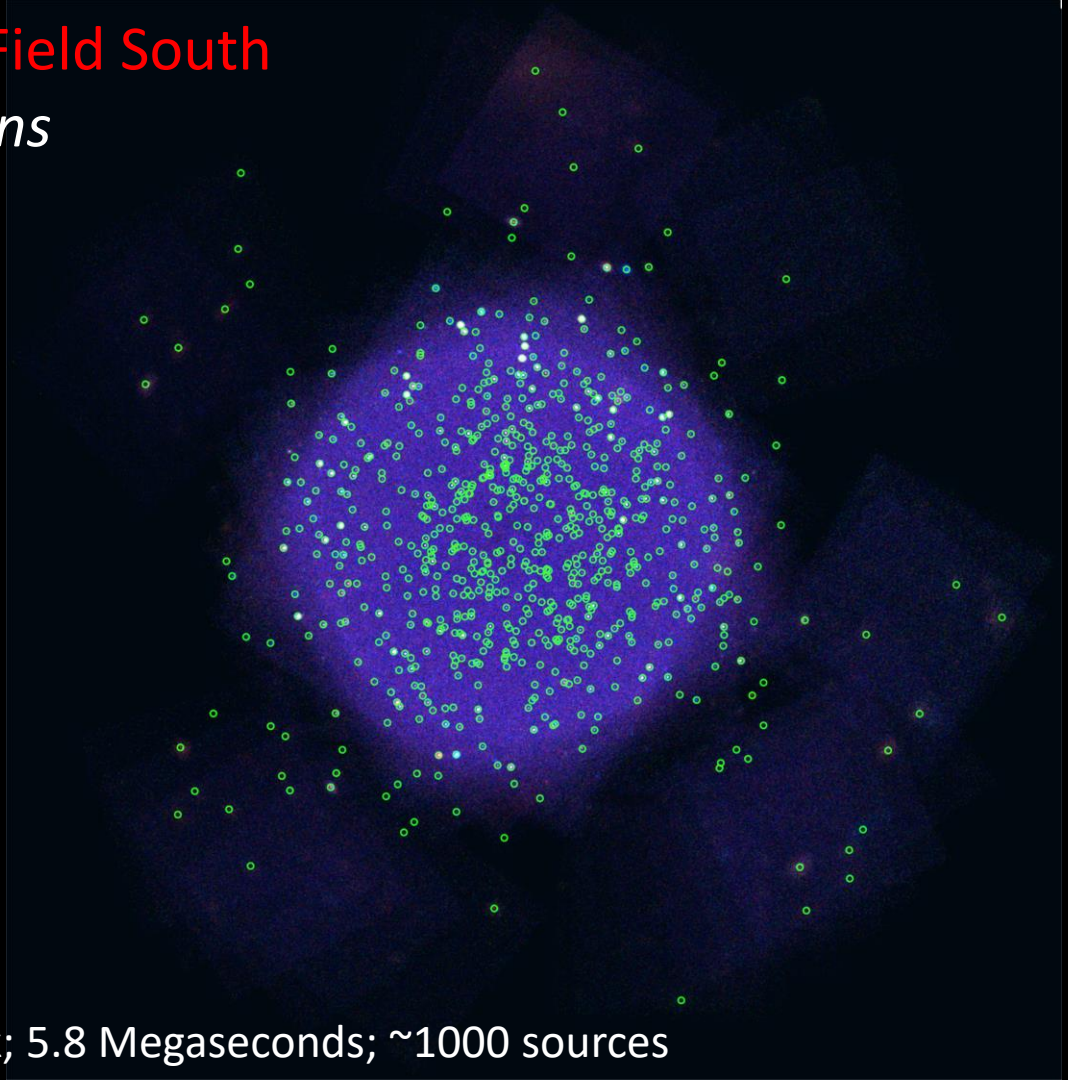
Final stacked image



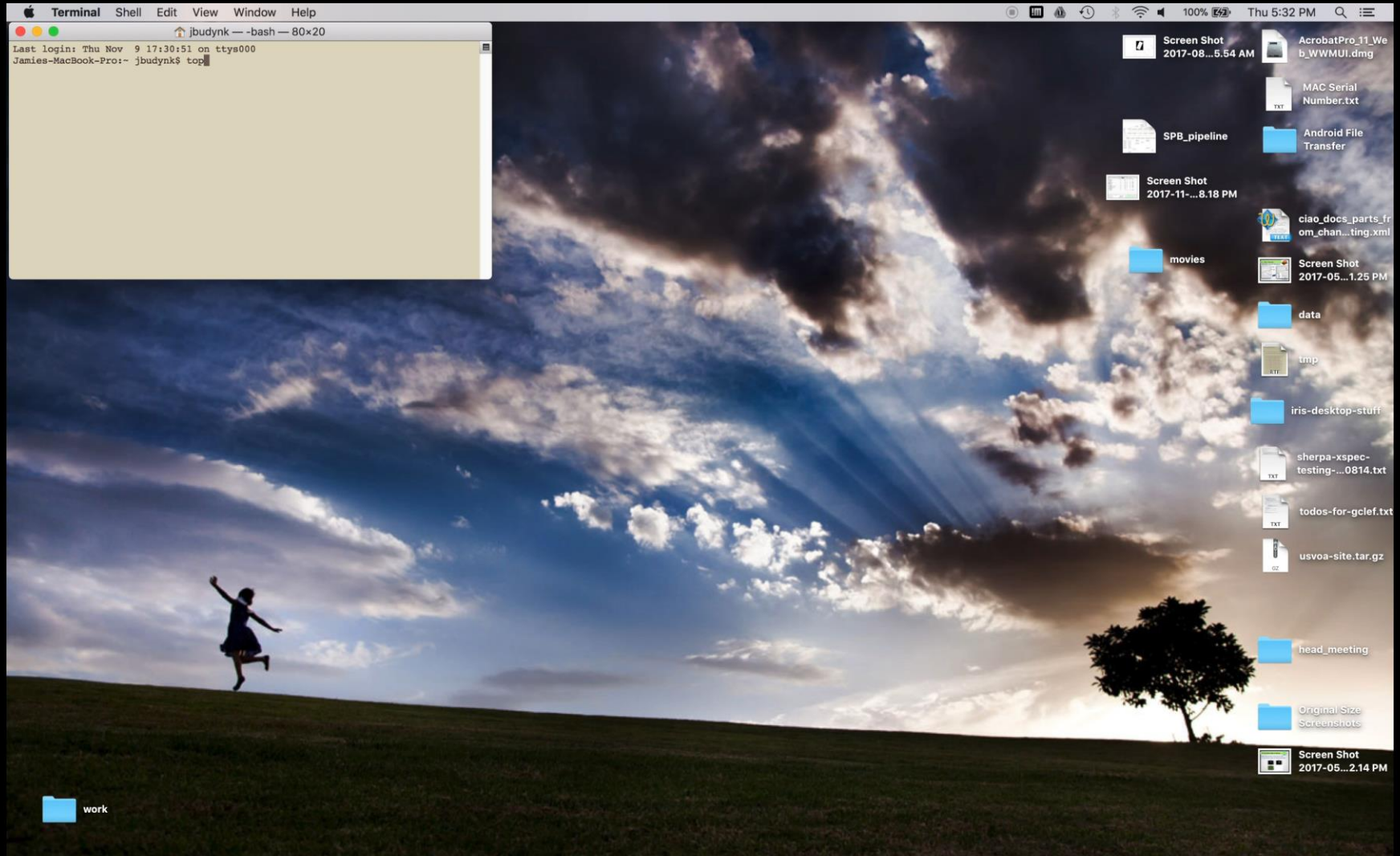
81 Observation stack; 5.8 Megaseconds

Chandra Deep Field South

Source detections



81 Observation stack; 5.8 Megaseconds; ~1000 sources


Terminal Shell Edit View Window Help
100% Thu 5:32 PM
jbudynk — -bash — 80×20
Last login: Thu Nov 9 17:30:51 on ttys000
Jamies-MacBook-Pro:~ jbudynk$ top
Screen Shot 2017-08...5.54 AM
AcrobatPro_11_Web_WWMUI.dmg
MAC Serial Number.txt
SPB_pipeline
Android File Transfer
Screen Shot 2017-11-...8.18 PM
ciao_docs_parts_from_chan...ting.xml
movies
Screen Shot 2017-05...1.25 PM
data
tmp
iris-desktop-stuff
sherpa-xspec-testing-...0814.txt
todos-for-gclef.txt
usvoa-site.tar.gz
head_meeting
Original Size Screenshots
Screen Shot 2017-05...2.14 PM
work

VO Interfaces …

Cone Search – *position, radius*

SIA – *Simple Image data Access*

TAP service – *Table Access Protocol*

SAMP – *Simple Application Messaging Protocol*

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HiPs – Hierarchical Progressive Survey

MOC – Multi-order Coverage Maps
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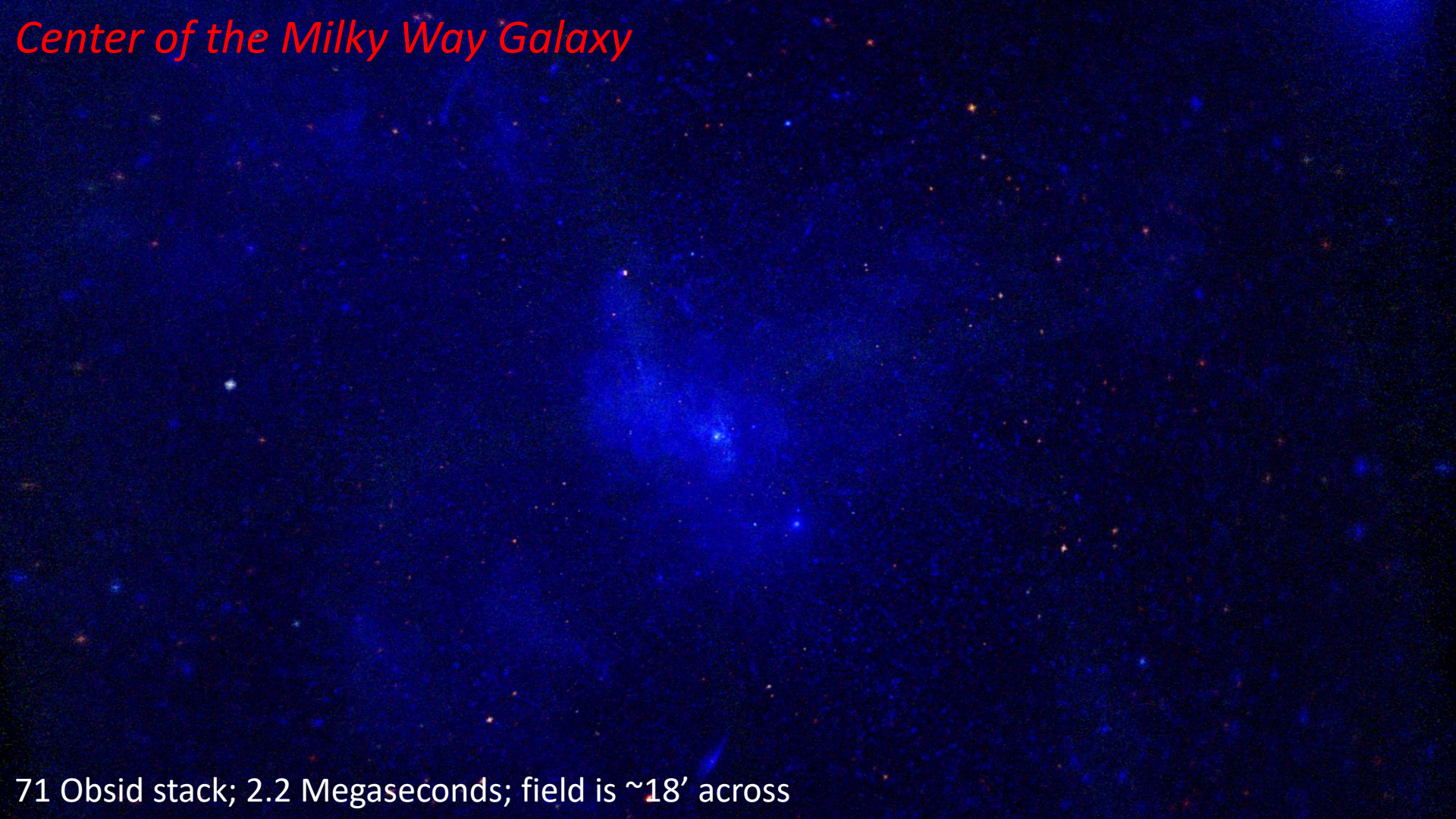
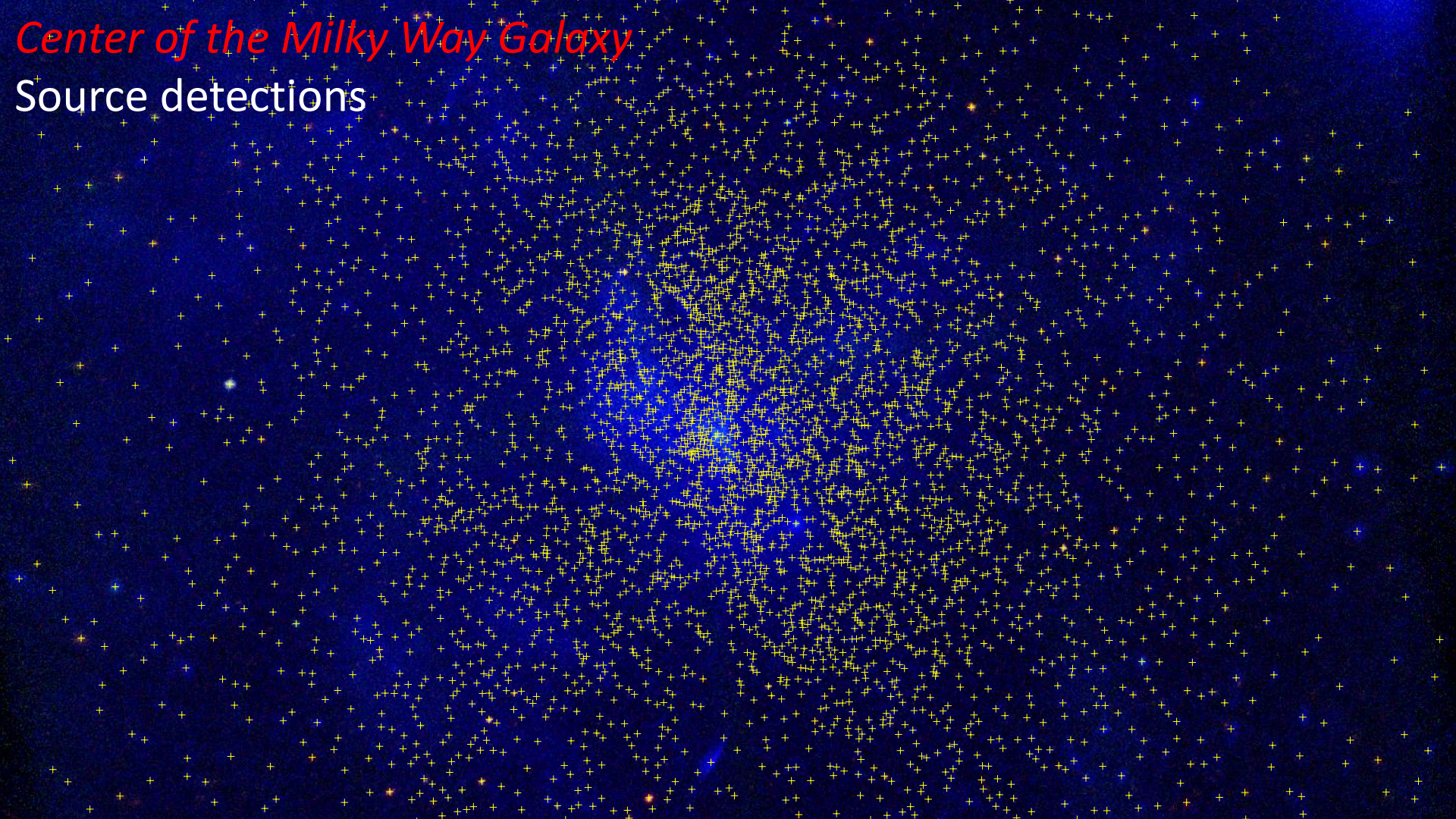
Citizen Science…

- The Chandra data is in the catalog
- Applications that incorporate VO standards interoperate
- Public use and education of X-ray and Multi-wavelength data thru the VO is a next step in education and use by the public at large


Center of the Milky Way Galaxy
71 Obsid stack; 2.2 Megaseconds; field is ~18’ across


Center of the Milky Way Galaxy
Source detections

More info …

Production of release 2 of the *Chandra Source Catalog* is in the last phase of processing. The complete catalog will be released in ~Feb 2018

For more details see the catalog website:

http://cxc.cfa.harvard.edu/csc/

It is our hope & expectation that the CSC will be a rich virtual facility for X-ray astronomy and a long lasting legacy of the Chandra program