

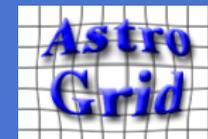
New VO access to 500+ LEDAS high energy catalogues in one go!

Jonathan Tedds

University of Leicester/XMM-Newton SSC/AstroGrid/
EuroVO DCA science team
jat@star.le.ac.uk



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Data Archives



Wide-Field Plate Database - Sofia Search Page



[WFPDB](#)

[VizieR](#)

[Aladin](#)

[Other Plate Catalogues](#)

[Access Log](#)

[Readme](#)

Query Setup

Maximum entries per page:

50 ▼

Output layout:

html table ▼

Output Order:

+ -

Search by Object or Field Coordinates

RA J2000

hh mm ss

[Star Gazer Visualization](#)

DEC J2000

dd mm ss

Field Size

deg

Radius Box Size

Instrument Field

Reduced Instrument Field

Magnitude

Magnitude Limit

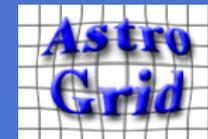
Additional display



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ESO Archive Query Form

[ESO Archive Overview](#) [Help Page](#) [FAQ](#) [Archive Facility HOME](#) [ESO HOME](#)

If you would like to query the Archive for instrument specific parameters, please use the [dedicated query forms](#).
To search for [HARPS GTO programmes](#), please use the dedicated [HARPS GTO query form](#).
To search for reduced data products, please have a look at the [ESO Data Products](#) page and the [Spectral Advanced Data Products](#) query form.

The checkboxes on the right of the parameters define whether or not they will be displayed on the query result page.

[query Help](#) [Status of Requests](#)

Target, Program and Scheduling Information

Target Name <input checked="" type="checkbox"/> <input type="text"/> Resolved by SIMBAD <input type="button" value="v"/> RA <input type="text"/> DEC <input type="text"/> J2000 Search Box <input type="text" value="00 10 00"/> Input RA(h) DEC(deg) <input type="button" value="v"/> Output <input checked="" type="checkbox"/> Sexagesimal (h, deg) <input type="button" value="v"/> List of Targets <input type="text"/> <input type="button" value="Browse..."/>	Night <input type="checkbox"/> <input type="text"/> (DD MM YYYY) <i>OR give a query range using the following start/end dates:</i> Start <input type="text"/> 12 hrs [UT] <input type="button" value="v"/> End <input type="text"/> 12 hrs [UT] <input type="button" value="v"/> Program ID <input checked="" type="checkbox"/> <input type="text"/> Program Type <input type="checkbox"/> Any <input type="button" value="v"/> PI CoI <input type="checkbox"/> <input type="text"/> SV <input type="checkbox"/> Any <input type="button" value="v"/> Title <input type="checkbox"/> <input type="text"/>
---	--

Observing Information

Imaging <input type="button" value="ALL"/> <input type="button" value="NONE"/> <input type="checkbox"/> VLT/FORS1 <input type="checkbox"/> VLT/FORS2	Spectroscopy <input type="button" value="ALL"/> <input type="button" value="NONE"/> <input type="checkbox"/> VLT/CRIRES <input type="checkbox"/> VLT/FORS1	Interferometry <input type="button" value="ALL"/> <input type="button" value="NONE"/> <input type="checkbox"/> VLT/MINCI <input type="checkbox"/> VLT/MIDI	Other <input type="button" value="ALL"/> <input type="button" value="NONE"/> <input type="checkbox"/> APEX/HET <input type="checkbox"/> APEX/BOL	Data Product Info Type <input checked="" type="checkbox"/> Any <input type="button" value="v"/> <i>User defined input:</i> <input type="text"/>
---	---	---	---	---



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DR5 Tools



- Getting Started
- Famous places
- Get images
- Scrolling sky
- Visual Tools
- Search
 - Radial
 - Rectangular
 - Search Form
 - Query Builder
 - SQL
- Object Crossid
- CasJobs

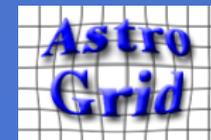
SQL Search

Please note: To be fair to other users, queries run from SkyServer search tools are restricted in how long they can run and how much output they return, by **timeouts** and **row limits**. Please see the **Query Limits help page**. To run a query that is not restricted by a timeout or number of rows returned, please use the **CasJobs batch query service**.

```
-- Please read the note above regarding query limits and spatial queries
select top 10 objid,ra,dec,u,g,r,i,z
from PhotoObj
where
  u between 0 and 19.6
  and g between 0 and 20
```

Check Syntax Only?
 Output Format:
 HTML
 XML
 CSV

To find out more about the database schema use the **Schema Browser**.



What's New

[LEDAS Overview](#)

[Contact Details](#)

[Subscribe to
LEDAS Newsletter](#)

[Acknowledgement
Request](#)

For comments or help, e-mail:
ledas-help@star.le.ac.uk

Welcome to LEDAS (LEicester Database and Archive Service)

LEDAS provides an on-line astronomical database service and access to archive data from high energy astrophysics missions. In particular, **LEDAS** provides the primary means of access for the UK astronomical community to the ROSAT Public Data Archive, the ASCA Public Data Archive, the *Ginga* Products Archive and now to the [Chandra Science Archive](#).

NEW USERS: For an overview of the services provided by **LEDAS**, user guides, contact details and further help, please see the [INFO](#) section of the **LEDAS** site. To go directly to any of our mission archives, software distribution sites or other services, click on the relevant link in the navigation bar.

LEDAS News:

[MORE](#)

- 04/08:** Presentation on LEDAS, AstroGrid and the Virtual Observatory, National Astronomy Meeting 2008 [\[more>\]](#)
- 04/08:** [PIMMS](#) and [WebPIMMS](#) updated to v3.9f. Multiple updated effective area curves [\[more>\]](#)
- 04/08:** [Chandra](#) data analysis software CIAO updated to version 4.02.

LEDAS Services:

[MORE](#)



LEDAS hosts mirrors of the Chandra Data Archive and the XMM Serendipitous Source Catalogues [1XMM](#) & [2XMM](#)

◆ **X-RAY DATA ARCHIVES:** Online data archives for ROSAT, *Ginga*



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What are Virtual Observatories (VOs)?

“The VO vision can be summed up as the desire to make all archives speak the same language – all searchable and analyzable by the same tools, all data sources accessible through a common interface, all data held in distributed databases that appear as one.”

September 2003

Andy Lawrence (PI AstroGrid)



Creating a Virtual Observatory - An International Effort

The International Virtual Observatory Alliance

Agree international standards for any dataset or astronomical resource published to the VO

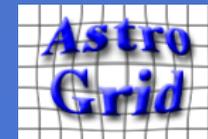
- *Allow simultaneous multi archive, multi parameter correlations*



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As a result of the IVOA we have

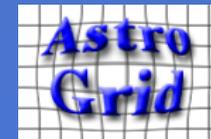
- A common Resource Metadata
- A common data querying language
 - Astronomical Data Query Language (ADQL)
 - Based on Structured Query Language (SQL)
- Common table format
 - Virtual Observatory Table (.vot)
- ...and much more in the pipeline



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Advantages of VO data access

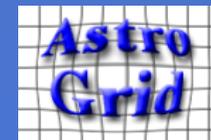
- Accessing multiwavelength data easier:
 - Do not need to access different interfaces, register once only



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Advantages of VO data access

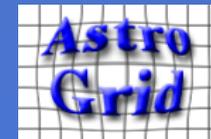
- Accessing multiwavelength data easier:
 - Do not need to access different interfaces, register once only
 - Data access from one single entry point
 - Able to build *workflows* i.e. pieces of code which run on the server and are reusable



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<http://www.astrogrid.org> (April 2008 1st public release)



search

HOME

INSTALL

HELP

SUPPORT

Welcome to AstroGrid



AstroGrid is the doorway to the Virtual Observatory (VO). We provide a suite of desktop applications to enable astronomers to explore and bookmark resources from around the world, find data, store and share files in VOSpace, query databases, plot and manipulate tables, cross-match catalogues, and build and run scripts to automate sequences of tasks. Tools from other Euro-VO projects inter-operate with AstroGrid software, so you can also view and analyse images and spectra located in the VO.

These web pages hold our software for downloading, as well as links to other people's software. They also provide the help documentation, and other support material such as FAQs and the Helpdesk ticket system.

Our new software (V2008.1) is released on April 1st 2008. Previous releases will still be available for some time : see [previous releases](#).

GETTING
STARTED

Read a little [about the Virtual Observatory](#)
Read a little [about the AstroGrid Desktop suite](#).
Go to the [Install area](#) and download the software.
Have a look at the documentation in the [Help area](#).
Start trying it out !

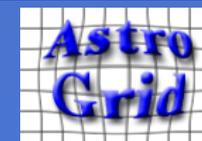
Acknowledging AstroGrid: If you make use of the AstroGrid system or tools, we would be grateful if you could acknowledge this use in any resulting publications. You could use these words: 'This research has made use of data obtained using, or software provided by, the UK's AstroGrid Virtual Observatory Project, which is funded by the Science & Technology Facilities Council and through the EU's Framework 6 programme.' Use of any data discovered or accessed through AstroGrid should of course be mentioned as noted by the data providers.



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VO Explorer: public release April 08

- AstroGrid front end, part of VOdesktop
- *Resource-centric*
- Select a search-space
- Search for resources
- Filter these resources
- View selected resources
- Use the selection
 - Invoke it
 - Save/Bookmark/Tag it
 - Export it

The screenshot shows the VO Explorer application window titled "VO Explorer - XMM-DRS". The interface includes a menu bar (File, Actions, Runtime, Window, Help), a search bar, and a list of resources. The left sidebar shows a tree view with "XMM-DRS" selected. The main panel displays a table of resources with columns for Status, Title, Capacity, and Date. Below the table, there is a "Details" view for the selected resource, "ROSAT PSPC Catalog of Clusters of Galaxies".

Status	Title	Capacity	Date
●	BAX X-Ray Galaxy Clusters and Groups Catalog	●●●●●	2007-03-28
●	Einstein Observatory Clusters of Galaxies Catalog	●●●●●	2007-03-28
●	Northern ROSAT All-Sky (NORAS) Galaxy Cluster Survey Catalog	●●●●●	2007-03-28
●	ROSAT All-Sky Survey Extended Brightest Cluster Sample	●●●●●	2007-03-28
●	ROSAT PSPC Catalog of Clusters of Galaxies	●●●●●	2007-03-28
●	ROSAT-ESG Flux-Limited X-Ray (REFLEX) Galaxy Cluster Survey	●●●●●	2007-03-28

ROSAT PSPC Catalog of Clusters of Galaxies
ROSAT/Clust, vo/voana/voasero/voagat/vo
Type: Catalog core search service

This is a catalog of 203 clusters of galaxies serendipitously detected in 647 ROSAT PSPC high Galactic latitude pointings covering 158 square degrees. This is one of the largest X-ray-selected cluster samples, comparable in size only to the ROSAT All-Sky Survey sample of nearby clusters (Ebeling et al. 1997). Clusters in the inner 17.5° of the ROSAT PSPC field of view are detected using the spatial extent of their X-ray emission. Fluxes of detected clusters range from 1.0×10^{-14} to 8×10^{-12} ergs $s^{-1} cm^{-2}$ in the 0.5-2 keV energy band. X-ray luminosities range from 10^{42} ergs s^{-1} , corresponding to very poor groups, to 5×10^{44} ergs s^{-1} , corresponding to rich clusters. The cluster redshifts range from $z = 0.015$ to $z = 0.5$. The catalog lists X-ray fluxes, core radii, and spectroscopic redshifts for 73 clusters and photometric redshifts for the remainder. Of 223 X-ray sources, 203 have been optically confirmed as clusters of galaxies. Of the remaining 20 sources, 18 are likely false detections arising from blends of unresolved point X-ray sources. Optical identifications of the remaining object are hampered by a nearby bright star. Above a flux of 2×10^{-13} ergs $s^{-1} cm^{-2}$, 89% of extended X-ray sources are optically confirmed clusters. The number of false



Access existing X-ray cluster catalogues

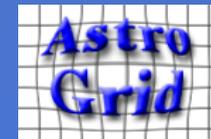
- Browse through keyword metadata



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VO Explorer - XMM-DR5

File Actions Runtime Window Help

- Radio & X-ray
- IR Redshift
- Recent Changes
- Solar
- VOEvent
- ROE Holdings
- XMM-DR5

The search named: X-ray clusters

Contains resources which match **all** of the following conditions:

Title	contains	X-ray	+	-
Any main field	contains	clusters	+	-

Any main field

- Title
- Subject
- Description
- Waveband
- Type
- Any column UCD
- Any column name

Find

Query Text
(title = X-ray) AND (default = clusters)

Create Cancel

VO Explorer - X-ray clusters

File Actions Runtime Window Help

New Search Stop Search 260 resources

St...	Title	Capability	Date
●	NGC 4472 Chandra X-Ray Point Source Catalog		2007-06-09
●	47 Tuc Globular Cluster Chandra X-Ray Point Source Catalog		2007-06-21
●	Chamaeleon I North Cloud Chandra X-Ray Point Source Catalog		2007-04-20
●	CHAMP (Chandra Multiwavelength Project) Hard X-Ray Emitting AGN		2007-04-20
●	BAX X-Ray Galaxy Clusters and Groups Catalog		2007-03-28
●	M31 Central Region Chandra X-Ray Point Source Catalog		2007-03-28
●	ROSAT All-Sky Survey/INSS Bright X-Ray Source Sample		2007-03-28
●	ROSAT-ESO Flux-Limited X-Ray (REFLEX) Galaxy Cluster Survey		2007-03-28
●	M 87 Chandra X-Ray Point Source Catalog		2007-04-02
●	Centaurus A Galaxy Chandra X-Ray Point Source Catalog		2007-04-20
●	Cep B/OB3 Star-Forming Region Chandra X-Ray Point Source Catalog		2007-04-20
●	XBOOTES: NDWFS Bootes Field X-Ray Point Source Catalog		2007-05-24
●	ELAIS N1 and N2 Fields Chandra X-Ray Point Source Catalog		2007-05-09
●	NGC 2362 Chandra X-Ray Point Source Catalog		2007-05-18
●	NGC 2547 XMM-Newton X-Ray Point Source Catalog		2007-05-18
●	RCW 38 Chandra X-Ray Point Source Catalog		2007-05-18
●	SPICES Lynx Field Chandra X-Ray Source Catalog		2007-05-24
●	NGC 2516 Cluster XMM-Newton X-Ray Point Source Catalog		2007-05-18
●	NGC 4472 Chandra X-Ray Point Source Catalog		2007-06-09
●	47 Tuc Globular Cluster Chandra X-Ray Point Source Catalog		2007-06-21

Actions

Query

About

Selected:
36 Catalog cone search service
2 Resource
222 TabularSkyService

Export

Details Tables XML entry

CHANDRA observations of NGC 2264 (Ramirez+, 2004) - Optical/infrared sources with X-ray counterparts

J/AJ/127/2659/ta, ivo://CDS/VizieR/JAJ/127/2659/table4
Type: Resource

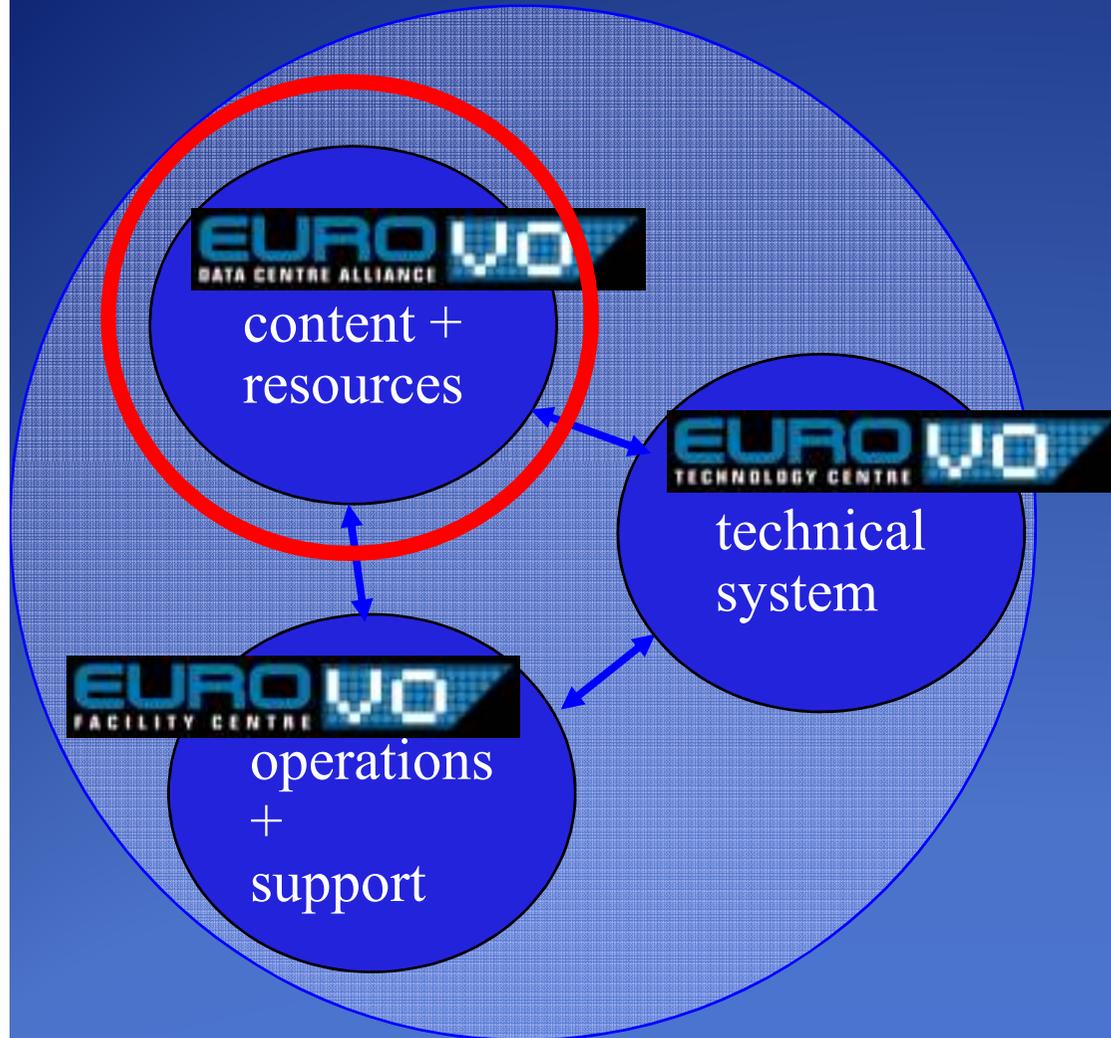
NGC 2264 was observed with the Advanced CCD Imaging Spectrometer (ACIS) detector on board the Chandra X-Ray Observatory on 2002 February 9.
Further information: <http://vizier.u-strasbg.fr/cgi-bin/Cat?JAJ/127/2659/table4>
Subject: open_clusters, photometry:wide-band, stars:variable
Level: research

Curation
Published by: CDS

Annotate
 Flag
Highlight
Alternative title
Notes
Tags
Related
Identity suggestion
CDS/VizieR/JAJ/127/

Description

EURO VO



- If data in a simple DB can publish to VO in ~day!
- We can help you: June 23-27, 2008 **data publishing** workshop at ESO, Garching
- For catalogues, images, spectra, transient & theoretical archives
- **Census** of European Data Centres & Archives
- UK contact: jat@star.le.ac.uk
- *See Tedds et al. poster J16!*

Select all LEDAS tables...

VO Explorer - LEDAS

File Edit View Resource Window Help

Resource Lists

- Examples
- Radio & X-ray
- IR Redshift
- Recent Changes
- Solar
- VOEvent
- ROE Holdings
- XMM-DR5
- X-ray clusters
- 2mass-2xmm-DR6
- LEDAS+XMM
- test
- Copy of test
- XMM at ROE
- XMM-DR6
- LEDAS**
- all XMM

Contents of LEDAS - filtering to 484 of 486 resources

Status	Flagg...	Title	Capability	Date
●		TYCHO2: Tycho-2 Catalog of the 2.5 Million Brightest Stars (LEDAS)		2008-03-26
●		2XMM: XMM Serendipitous Source Catalogue: 2XMM (Pre-release) (LEDAS)		2008-03-26
●		2XMM: XMM Second Serendipitous Source Survey : 2XMM (LEDAS)		2008-03-26
●		TWOSIGMA: Einstein Two-Sigma Catalog (LEDAS)		2008-03-26
●		TRIFIDCXO: Trifid Nebula (M 20) Chandra X-Ray Point Source Catalog (LEDAS)		2008-03-26
●		TGS2: EXOSAT TGS Spectra and Lightcurves (LEDAS)		2008-03-26
●		TGS: EXOSAT TGS L and R Orders (LEDAS)		2008-03-26
●		TEXAS: Texas Survey of Radio Sources at 365 MHz (LEDAS)		2008-03-26
●		TD1: TD1 Stellar Ultraviolet Fluxes Catalog (LEDAS)		2008-03-26
●		TAURUSXMM: Taurus Molecular Cloud XMM-Newton X-Ray Source Catalog (LEDAS)		2008-03-26
●		TARTARUS: Tartarus: Reduced ASCA AGN Data (Version 3.1) (LEDAS)		2008-03-26
●		SYMBIOTICS: Symbiotic Stars Catalog (LEDAS)		2008-03-26
●		SWIRECXO: Spitzer Wide-Area IR Extra-Galactic Survey Chandra X-Ray Sources (LEDAS)		2008-03-26
●		SWIFTXRLOG: Swift XRT Instrument Log (LEDAS)		2008-03-26
●		SWIFTUVLOG: Swift UVOT Instrument Log (LEDAS)		2008-03-26
●		SWIFTDRSS: Swift TDRSS Messages (LEDAS)		2008-03-26
●		SWIFTMASTR: Swift Master Catalog (LEDAS)		2008-03-26
●		SWIFTBALOG: Swift BAT Instrument Log (LEDAS)		2008-03-26
●		SUZAXISLOG: Suzaku XIS Configuration Log (LEDAS)		2008-03-26
●		SUMSS: Sydney University Molonglo Sky Survey (SUMSS) Source Catalog (LEDAS)		2008-03-26
●		SUBPFCLOG: Subaru Prime Focus Camera (Suprime-Cam) Exposures Log (LEDAS)		2008-03-26
●		STERNGRB: Stern et al. (2001) BATSE Gamma-Ray Burst Catalog (LEDAS)		2008-03-26
●		SSSRW: Einstein SSS and MPC Raw Data (LEDAS)		2008-03-26
●		SSS: Einstein SSS Spectra and Lightcurves (LEDAS)		2008-03-26
●		SPITZMASTR: Spitzer Space Telescope Observation Log (LEDAS)		2008-03-26
●		SPICESCXO: SPICES Lynx Field Chandra X-Ray Source Catalog (LEDAS)		2008-03-26

Filter results

+ New Smart List

Actions

Query

About

Selection: CatalogService

Further Info

Email Curator

Information Table Metadata XML

Catalogue

Table **twoxmm** flux

2XMM: XMM Second Serendipitous Source Survey : 2XMM (LEDAS)

#	Column Name	Description	Datatype	UCD	Units
270	sc_ep_1_flux	Weighted mean EP band 1 flux from all detections of the source SRCID	float		erg/cm**2/s
271	sc_ep_1_flux_err	Error on the weighted mean band 1 flux in SC_EP_1_FLUX	float		erg/cm**2/2

More advanced query: Access all extended 2XMM X-ray sources

- Make own X-ray cluster candidate catalogue
- Filter large multiwavelength archives remotely:
 - Create manageable science subsets

VO Explorer - LEDAS

File Edit View Resource Window Help

Resource Lists

- Examples
- Radio & X-ray
- IR Redshift
- Recent Changes
- Solar
- VOEvent
- ROE Holdings
- XMM-DR5
- X-ray clusters
- 2mass-2xmm-DR6
- LEDAS+XMM
- test
- Copy of test
- XMM at ROE
- XMM-DR6
- LEDAS**
- all XMM

Contents of LEDAS - filtering to 484 of 486 resources

Status	Flagg...	Title	Capability	Date
●		LEDAS		2008-03-26
●		ZWCLUSTERS: Zwicky Clusters (LEDAS)		2008-03-26
●		ZCAT: CfA Redshift Catalog (June 1995 Version) (LEDAS)		2008-03-26
●		XTETOO: XTE Public TOO and Other Missing Observations (LEDAS)		2008-03-26
●		XTETARGET: XTE Target Information (LEDAS)		2008-03-26
●		XTESLEW: XTE Archived Public Slew Data (LEDAS)		2008-03-26
●		XTEPUBLIC: XTE Archived Public Data (LEDAS)		2008-03-26
●		XTEPUBALL: XTE Archived Public Data (Including Slews) (LEDAS)		2008-03-26
●		XTEOBS: XTE Observation Log (LEDAS)		2008-03-26
●		XTEMASTER: XTE Master Catalog (LEDAS)		2008-03-26
●		XTEINDEX: XTE Target Index Catalog (LEDAS)		2008-03-26
●		XTEASSCAT: XTE All-Sky Slew Survey Catalog (LEDAS)		2008-03-26
●		XTEASSAGN: XTE All-Sky Slew Survey AGN Catalog (LEDAS)		2008-03-26
●		XTEASMQUICK: XTE All-Sky Monitor Quicklook Observed Data (LEDAS)		2008-03-26
●		XTEASMLONG: XTE All-Sky Monitor Long-Term Observed Sources (LEDAS)		2008-03-26
●		XTEAO: XTE Proposal Info & Abstracts (LEDAS)		2008-03-26
●		XRBCAT: X-Ray Binaries Catalog (LEDAS)		2008-03-26
●		XRAY: Master X-Ray Catalog (LEDAS)		2008-03-26
●		XMS: XMM-Newton Medium Sensitivity Survey (XMS) Source Catalog (LEDAS)		2008-03-26
●		XMMXASSIST: XMM-Newton XAssist Source List (LEDAS)		2008-03-26
●		XMMSLEWFUL: XMM-Newton Slew Survey Full Source Catalog v1.1 (LEDAS)		2008-03-26
●		XMMSLEWCLN: XMM-Newton Slew Survey Clean Source Catalog v1.1 (LEDAS)		2008-03-26
●		XMMPUBLIC: XMM-Newton U.S. Public Archive (LEDAS)		2008-03-26
●		XMMMMASTERNEW: NEW XMM-Newton Master Log & Public Archive (LEDAS)		2008-03-26

Information Table Metadata XML

Catalogue

Table **twoxmm**

2XMM: XMM Second Serendipitous Source Survey : 2XMM (LEDAS)

#	Column Name	Description	Datatype	UCD	Units
164	ep_extent	Source extent radius	float		arcsec
165	ep_extent_err	Source extent radius error	float		arcsec
166	ep_extent_ml	Source extent maximum likelihood	float		
294	sc_ext_ml	Total band extended source detection likelihood from all detections of the source SRCID	float		

Columns

Task Runner for LEDAS - untitled

File Edit Task Result Window Help

LEDAS Interface: ADQL Execute!

Inputs Outputs Execution

Query Result Store in cache

Format VOTABLE

Edit Comment

Select * From

LEDAS

Catalogue

Table **twoxmm** ext

2XMM: XMM Second Serendipitous Source Survey : 2XMM (LEDAS)

#	Column Name	Description	Datatype	UCD	Units
164	ep_extent	Source extent radius	float		arcsec
165	ep_extent_err	Source extent radius error	float		arcsec
166	ep_extent_ml	Source extent maximum likelihood	float		
294	sc_ext_ml	Total band extended source detection likelihood from all detections of the source SRCID	float		

Select Items * From

Validate Edit

Diagnostics History stack

Filter columns

Task Runner for LEDAS - untitled

File Edit Task Result Window Help

LEDAS Interface: ADQL Execute!

Inputs Query Format VOTABLE

Outputs Result Store in cache

Execution ADQL - LEDAS No change: will re-check in 8 seconds

Edit Comment

Select Top 100 * From
twoxmm as ext Where
ext.ep_extent>6.0

Validate Edit

LEDAS

Catalogue

Table twoxmm ext

2XMM JMM Second Serendipitous Source Survey : 2XMM (LEDAS)

#	Column Name	Description	Datatype	UCD	Units
16	ep_extent	Source extent radius	float		arcsec
16	ep_extent_err	Source extent radius error	float		arcsec
16	ep_extent_ml	Source extent maximum likelihood	float		

Diagnostics History stack

Query

Task Runner for LEDAS - untitled

File Edit Task Result Window Help

LEDAS Interface: ADQL Execute!

Inputs

Query

Format

VOTABLE

Outputs

Result

Store in cache

Execution

ADQL - LEDAS

COMPLETED

Result.txt

Edit Comment

Select Top 100 * From
twoxmm as ext Where
ext.ep_extent>6.0

Validate Edit

LEDAS

Catalogue

Table twoxmm ext

2XMM: XMM Second Serendipitous Source Survey : 2XMM (LEDAS)

#	Column Name	Description	Datatype	UCD	Units
164	ep_extent	Source extent radius	float		arcsec
165	ep_extent_err	Source extent radius error	float		arcsec
166	ep_extent_ml	Source extent maximum likelihood	float		

Diagnostics History stack



Table Browser for 50: Result.txt

	detid	srcid	iauname	src_num	match_1xmm	sep_1xmm	srcid_2xmmp	match_2xmmp	sep_2xmmp	
65	1376	1284	2XMM J001027.0+110601	8	1XMM J001027.2+110602	2.5222	0.		0.	1
23	484	484	2XMM J000315.1-260928	67		0.	443.	2XMMp J000315.2-260929	0.968937	1
11	257	257	2XMM J000231.6-355402	105		0.	0.		0.	1
81	1739	1647	2XMM J001344.9-301830	62		0.	0.		0.	
59	1230	1145	2XMM J000707.0+634720	71		0.	836.	2XMMp J000706.8+634721	1.54368	1
68	1471	1379	2XMM J001121.7-112851	5		0.	0.		0.	1
21	465	465	2XMM J000312.2-360424	44		0.	425.	2XMMp J000312.3-360424	0.538117	1
89	1854	1762	2XMM J001422.5-302157	8		0.	0.		0.	
12	294	294	2XMM J000239.3-295752	145		0.	255.	2XMMp J000239.4-295754	2.25933	
95	2013	1901	2XMM J001514.4-391244	71		0.	1560.	2XMMp J001514.3-391244	1.01447	
26	525	525	2XMM J000322.3-260017	73		0.	485.	2XMMp J000322.3-260018	0.681124	1
14	369	369	2XMM J000256.3-295531	71		0.	330.	2XMMp J000256.3-295531	0.639851	
55	1162	1091	2XMM J000645.0-344524	58		0.	0.		0.	2
53	1101	1042	2XMM J000632.7+634122	27		0.	0.		0.	1
57	1171	1100	2XMM J000647.5+201200	54		0.	0.		0.	3
2	10	10	2XMM J000003.1-321404	80		0.	0.		0.	3
82	1740	1648	2XMM J001345.0-271655	76		0.	1316.	2XMMp J001345.0-271655	0.430977	2
52	1074	1019	2XMM J000627.2+195948	107		0.	0.		0.	3
99	2077	1956	2XMM J001530.3-391354	96		0.	1613.	2XMMp J001530.4-391353	1.86942	
5	59	59	2XMM J000029.8-251213	13		0.	32.	2XMMp J000029.8-251213	0.531239	1
33	778	778	2XMM J000423.3-360122	141		0.	0.		0.	1
83	1806	1714	2XMM J001405.8-302258	22	1XMM J001406.0-302260	1.23303	1381.	2XMMp J001405.8-302257	1.09768	
17	421	421	2XMM J000304.2-294902	117		0.	379.	2XMMp J000304.2-294903	0.517305	
40	952	921	2XMM J000557.3+202241	37		0.	0.		0.	3
96	2015	1901	2XMM J001514.4-391244	82		0.	1560.	2XMMp J001514.3-391244	1.01447	
44	972	937	2XMM J000601.1+202032	46		0.	0.		0.	3
70	1661	1569	2XMM J001319.3-271253	106		0.	1238.	2XMMp J001319.1-271252	2.63015	2
19	435	435	2XMM J000307.2-255243	89		0.	0.		0.	1
51	1067	1013	2XMM J000625.6+200921	53		0.	0.		0.	1

Workflows

- **Python** + Perl, IDL scripts...
 - Single archive image search
 - Cone search for multiple, user defined archives
 - SExtractor script – generate catalogue from images
 - Montage - mosaic tool
- Taverna
 - Graphical interface
 - Embed existing code (any language)



The screenshot shows the AstroGrid website interface. At the top left is the AstroGrid logo. To its right is a search bar with a 'Search' button. Below the search bar is a navigation menu with buttons for 'HOME', 'INSTALL', 'HELP', 'SUPPORT', and 'COMMUNITY'. On the right side of the menu, there is a link for 'page > site high'. The main content area features the title 'Introduction to Scripting and Workflows'. The text below the title explains that a workflow is a sequence of VO-related tasks that can be saved and re-run. It provides an example of a workflow involving image search, extraction, and cataloging. The article is divided into sections: 'Graphical workflow editors' and 'Workflow with scripting'. The 'Workflow with scripting' section includes a code snippet for reading a FITS file.

Introduction to Scripting and Workflows

A **workflow** is simply a sequence of VO-related tasks, possibly including loops, which can be saved in some format and then re-run. An example might be querying a specific "SLAP" image service to find an image at a particular RA and Dec; sending the image found to an irrevocable copy of SExtractor, putting in suitable parameters, and deriving an object catalogue, saving the resulting table to your VOspace, and then also loading the catalog into Topcat. Before re-running the workflow, one can then change the parameters used, or otherwise alter some of the tasks, for example running against a different SLAP service, or using a different RA and Dec. There are two ways of building a workflow.

Graphical workflow editors

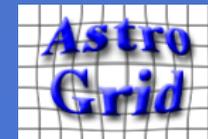
The first way is with an application that uses a graphical interface that puts together standard building blocks visually. The workflow is saved as a workflow document in a standard XML format; the application can also load such a workflow document and alter the visual flow diagram. This approach has become common in the world of Bio-informatics. A well known tool is Taverna, constructed by the MyGrid project. AstroGrid has been developing a version of Taverna with VO plugins; this will be made available in the next AstroGrid release.

Workflow with scripting

The second way to automate sequences of VO tasks is by writing a script that includes calls that correspond to VO tasks. An example (using AstroGrid Python) is

```
img = m.readfile('#sdss/image.fits')
```

which reads a file called "image.fits" from a folder in the user's VOspace called "sdss" and puts it into an object called "img"



Command Line Scripting

- Connect to the AstroGrid system from command line
- Write your own Python scripts (*IDL, perl...to come*)

```
#!/usr/bin/python
# Given an input list of objects, queries the 2MASS catalogue returning a
# VOTable for each object.

from astrogrid import ConeSearch
from astrogrid.utils import broadcast, read_votable

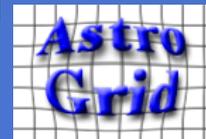
# Read input list of ra, decs from VOTable
vot=read_votable('sample.vot')
id = vot['id']
ra = map(float, vot['ra'])
dec = map(float, vot['dec'])

# We are going to query 2MASS at RoE
ivorn = 'ivo://wfau.roe.ac.uk/twomass-dsa/cone'
cone = ConeSearch(ivorn)

nsrc = len(ra) # Number of sources
radius=20./3600.0 # Search radius in degrees

print 'Starting Query: %d objects' % nsrc

for i in range(nsrc):
    res = cone.execute(ra[i], dec[i], radius)
    # Uncomment the following line if you want to send the output to TOPCAT
    # broadcast(res)
    print 'Writing 2mass_%s.vot' % id[i]
    open('2mass_%s.vot' % id[i], 'w').write(res)
```



e.g. correlation with SDSS

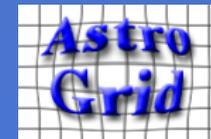
- Select SDSS galaxies within 1 arcmin of 411 X-ray positions
 - photometry (ugriz), photometric redshifts
 - spectra, spectroscopic redshifts
 - colour thumbnail images
- Visual inspection of images, spectroscopic and photoscopic redshifts



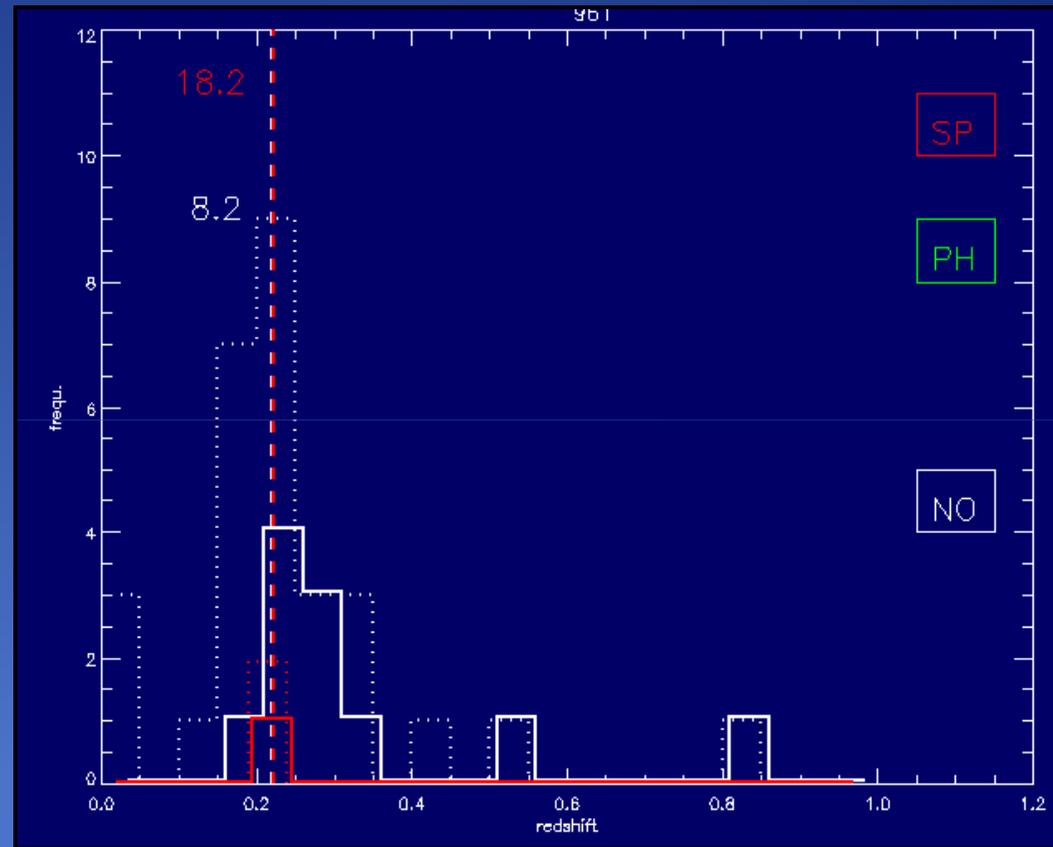
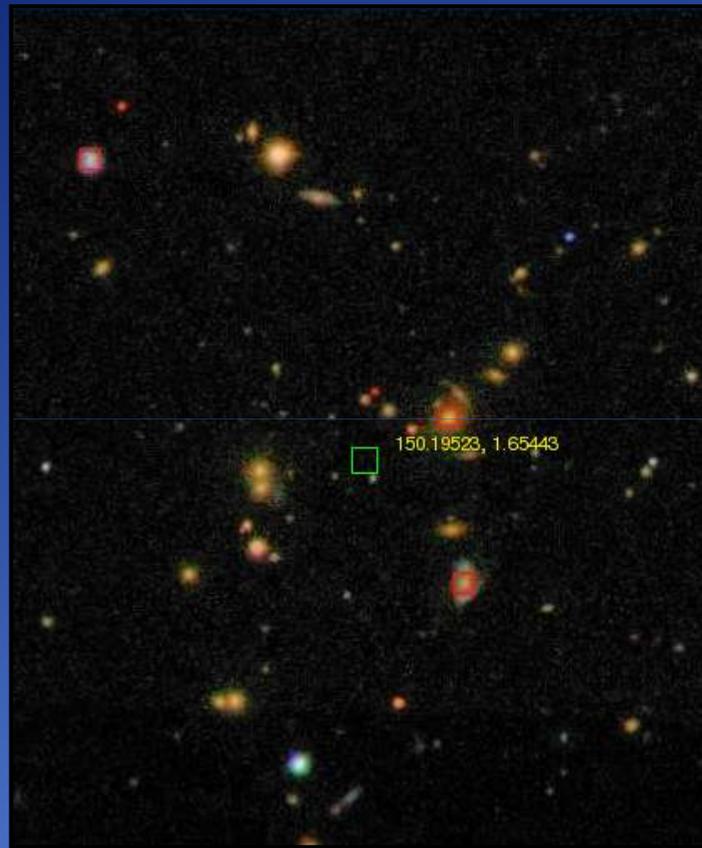
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Leicester



Jonathan Tedds
X-ray Universe 2008



Correlation with SDSS



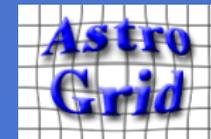
Spectroscopic $z = 0.223$ (Lamer+, in prep)



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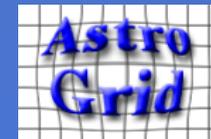


The VO is already in use...

- Using VO tools to investigate distant radio starburst hosting obscured AGN in the HDF(N) region
 - *Richards et al., A&A, 472, 805 (2007)*
- Albus 1: a very bright White Dwarf candidate
 - *Caballero & Solano, ApJ, 665, L151 (2007)*
- Flare productivity of newly-emerged paired and isolated solar active regions
 - *Dalla et al., A&A, 468, 1103 (2007)*
- Radio-loud Narrow-Line Type 1 Quasars
 - *Komossa et al., AJ, 132, 531 (2006)*
- Luminous AGB stars in nearby galaxies: a study using VO tools
 - *Salmantza et al., A&A, 447, 89 (2006)*

Advantages of VO data access

- Accessing multiwavelength data easier:
 - Do not need to access different interfaces, register once only
 - Data access from one single entry point
 - Able to build *workflows* i.e. pieces of code which run on the server and are reusable
- Tools to analyse the returned data
 - Different tools which share standards on how to interoperate



X-Ray Upper Limit Server: *Clive Page/XMM-SSC* + *Duncan Law-Green /LEDAS*

Raw & processed archive data

FITS

HDS

JPG

Measure counts within circle and fitted Background + set detection LH threshold

⇒ *Empirical upper-limit to flux according to algorithm of Carrera+ 07*



X-Ray Upper Limit Server

Raw & processed archive data

FITS

HDS

JPG

Catalogue Fluxes



X-Ray Upper Limit Server

Raw & processed archive data

FITS

HDS

JPG

Catalogue Fluxes

Generated Fluxes



X-Ray Upper Limit Server

Raw & processed archive data

FITS

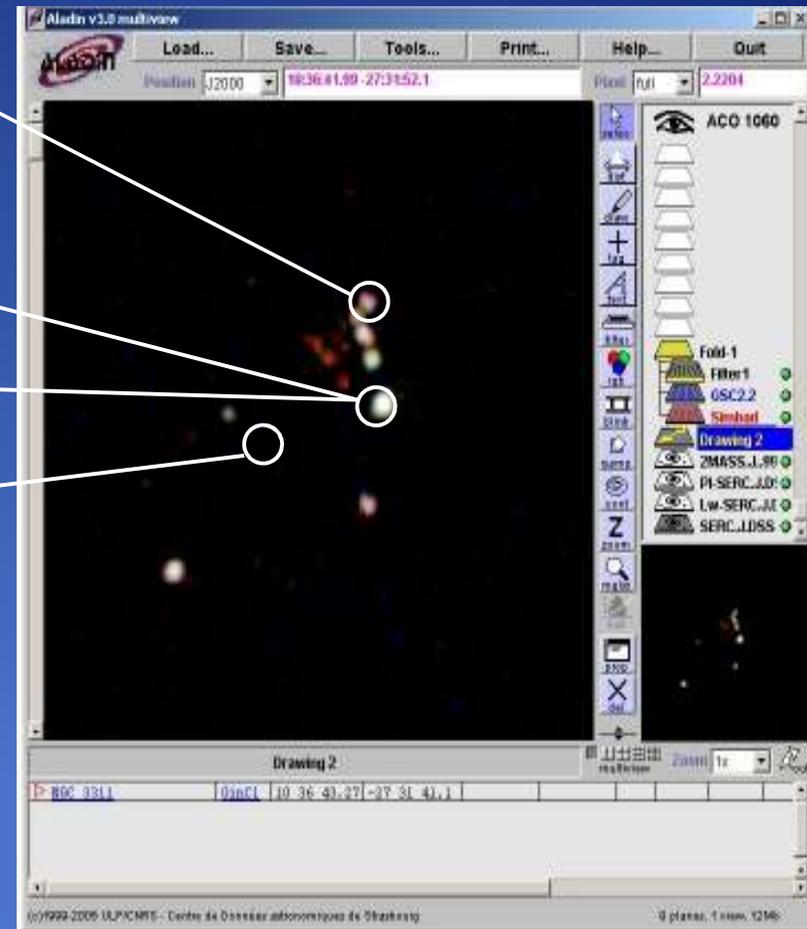
HDS

JPG

Catalogue Fluxes

Generated Fluxes

Flux limits



X-Ray Upper Limit Server

Raw & processed archive data

FITS

HDS

JPG

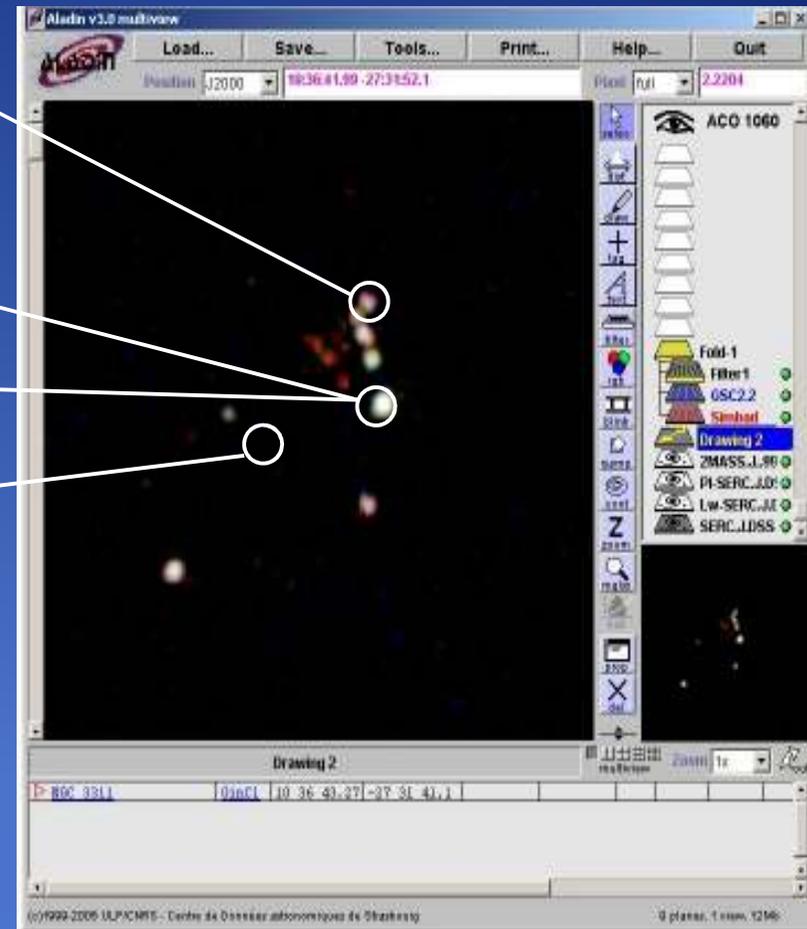
Catalogue Fluxes

Generated Fluxes

Flux limits

Automation (workflow)

Generated spectra/time series, thumbnail images



X-Ray Upper Limit Server

Raw & processed archive data

FITS

HDS

JPG

Catalogue Fluxes

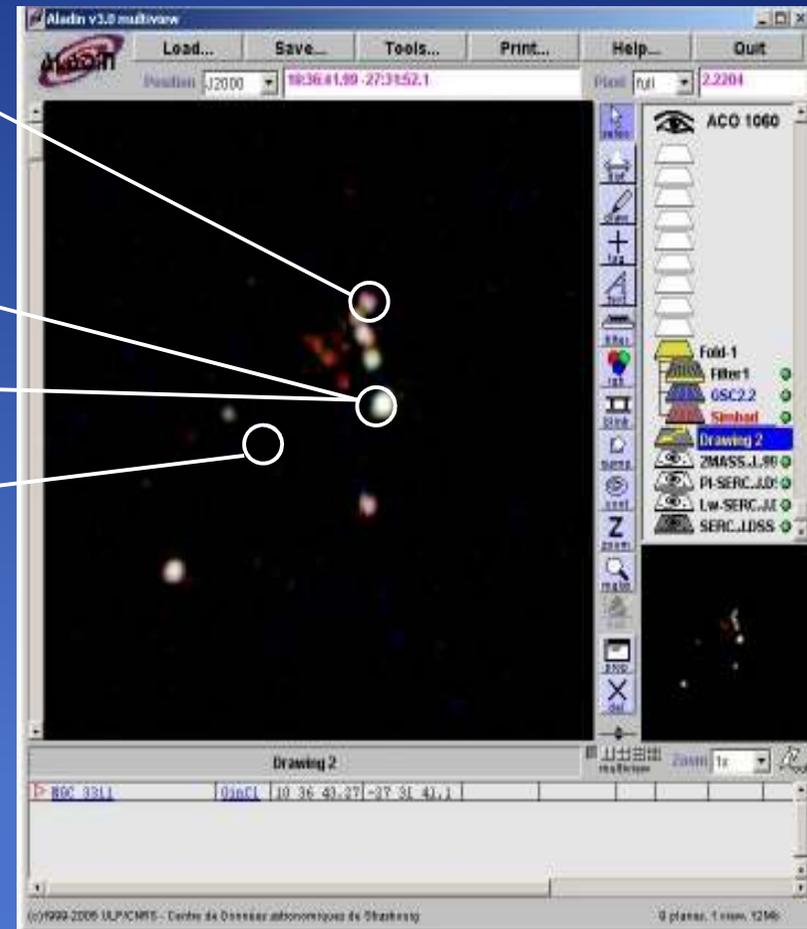
Generated Fluxes

Flux limits

e.g. upper limits for SDSS optically selected BAL QSOs (Cottis, Goad et al)

Automation (workflow)

Generated spectra/time series, thumbnail images



<http://www.astrogrid.org> (April 2008 1st public release)



search

HOME

INSTALL

HELP

SUPPORT

Welcome to AstroGrid



AstroGrid is the doorway to the Virtual Observatory (VO). We provide a suite of desktop applications to enable astronomers to explore and bookmark resources from around the world, find data, store and share files in VOSpace, query databases, plot and manipulate tables, cross-match catalogues, and build and run scripts to automate sequences of tasks. Tools from other Euro-VO projects inter-operate with AstroGrid software, so you can also view and analyse images and spectra located in the VO.

These web pages hold our software for downloading, as well as links to other people's software. They also provide the help documentation, and other support material such as FAQs and the Helpdesk ticket system.

Our new software (V2008.1) is released on April 1st 2008. Previous releases will still be available for some time : see [previous releases](#).

GETTING
STARTED

Read a little [about the Virtual Observatory](#)
Read a little [about the AstroGrid Desktop suite](#).
Go to the [Install area](#) and download the software.
Have a look at the documentation in the [Help area](#).
Start trying it out !

Acknowledging AstroGrid: If you make use of the AstroGrid system or tools, we would be grateful if you could acknowledge this use in any resulting publications. You could use these words: 'This research has made use of data obtained using, or software provided by, the UK's AstroGrid Virtual Observatory Project, which is funded by the Science & Technology Facilities Council and through the EU's Framework 6 programme.' Use of any data discovered or accessed through AstroGrid should of course be mentioned as noted by the data providers.



University of
Leicester



Jonathan Tedds
X-ray Universe 2008

