



The ASI Science Data Center

L.A. Antonelli
INAF-OAR & ASI-ASDC



The ASI Science Data Center

The ASI Science Data Center (ASDC) is a facility established in November 2000 by ASI to support all ASI missions dedicated to the Observation of the Universe in the management and long-term preservation of scientific space data.

The ASDC activities are under the responsibility of ASI

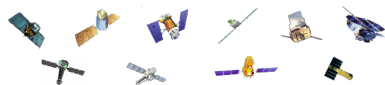
The ASDC also provides up-to-date services to the scientific community in the field of data handling, data distribution and archival research.

Following an agreement between ASI and ESA, the ASDC is located at the ESA establishment of ESRIN in Frascati, Italy.

All ASDC archives and software systems rely on a solid and well protected hardware infrastructure managed by ASI staff and operated by industrial personnel (DATASPAZIO) in cooperation with ESA-ESRIN

Since July 2005, a contract has been stipulated between ASI and INAF, in order to provide ASDC with scientific personnel. The aim of this contract is to support both scientific and technical activities oriented to specific missions and to provide also the natural interface with the astronomical community.

ASDC



The ASDC

ASDC Responsible
P. Giommi (ASI)

INTERNATIONAL CONTEXT:

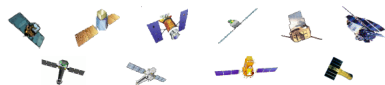
- Chandra Science Center (USA)
- Leicester Database and Archive Centre (LEDAS) (UK)
- CDS Strasburgo (France)
- ESA-XMM Scientific Operations Center Vilspa, Spain,
- MPE Data Center (Germany)
- INTEGRAL Science Data Center (Swi)

Multimission Data Centers (USA) :
NASA/HEASARC (high energies)
Hubble Archive (UV, Optical)
NASA/IPAC (IR)
NRAO-VLA (radio),

ASDC Responsibilities

- Support ASI's scientific missions (dedicated to the Observation of the Universe) in the management and archival of space data.
- Create and maintain a permanent data archive (including data, software, calibration and expertise) of all ASI scientific missions
- Act as the interface between ASI scientific projects and the users's community and support the Italian scientific community in data analysis and archival research
- Provide on-line access to archival data, analysis software, calibration files and documentation
- Host a copy of data archives of international missions for which there is an interest in the Italian scientific community
- Develop and maintain software for the efficient access, analysis and comparison of archival data
- Establish collaborations with scientific institutions and other data centers for the exchange of data, software and expertise.

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INAF Personnel



- Adriano Fontana - INAF Contract Scientific Responsible (INAF)

Scientific coordination support:

- L. Angelo Antonelli - Senior Scientist (INAF)
- Roberto Buonanno - Senior Scientist (Univ. Roma 2)
- Enrico Massaro - Senior Scientist (Univ. Roma 1)

Missions and Archives Scientific support (INAF):

Mission Specialist Scientists:

- Milvia Capalbi
- Matteo Perri
- Carlotta Pittori

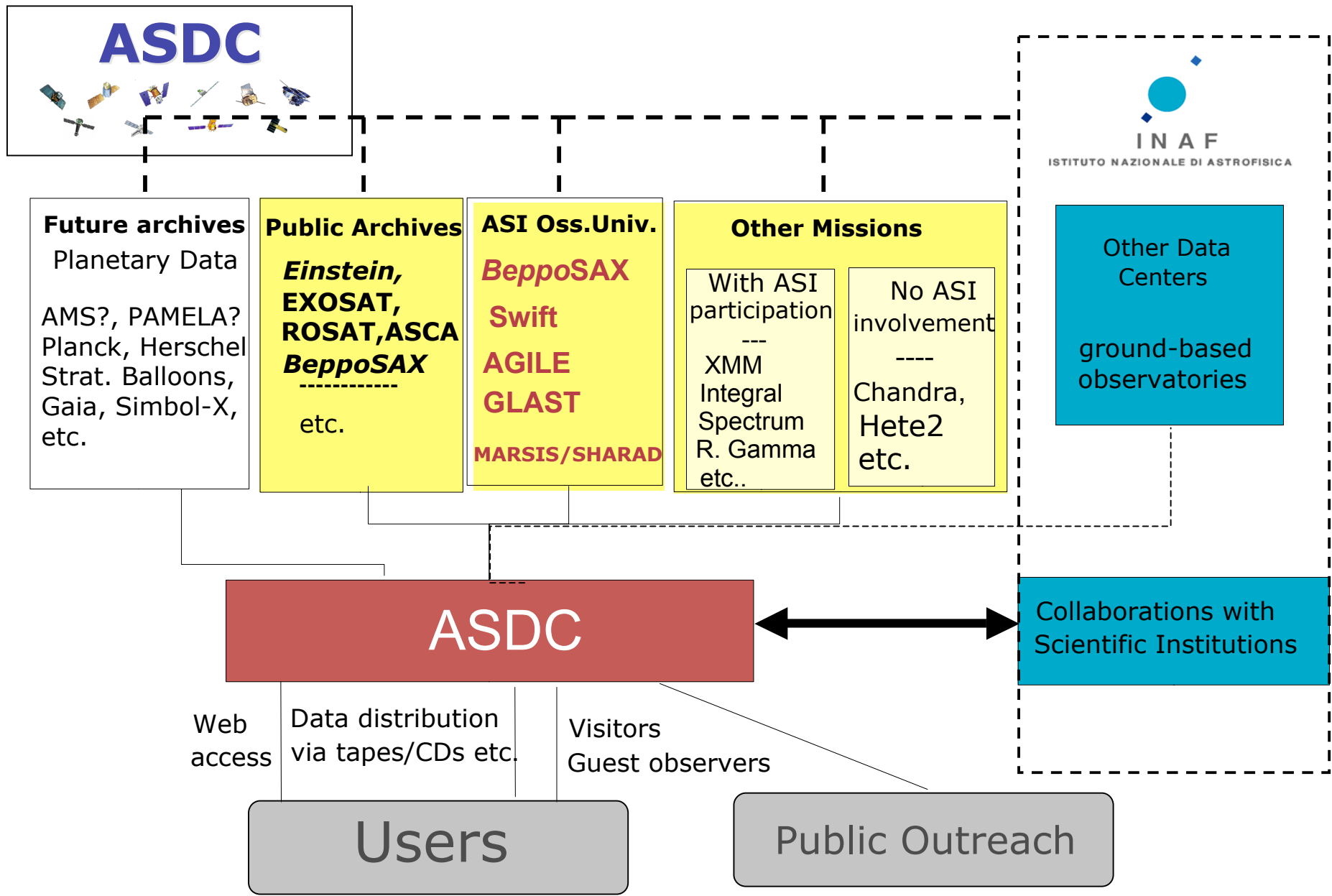
Archive Scientists:

- Sara Cutini
- Dario Gasparrini
- Stefano Granata
- Simonetta Puccetti

- Patrizia Santolamazza
- Francesco Verrecchia
- Loredana Vetere

Data Assistant:

- Cristina Leto
- Maria Elena Pennisi





ASDC Activities: Mission Archives

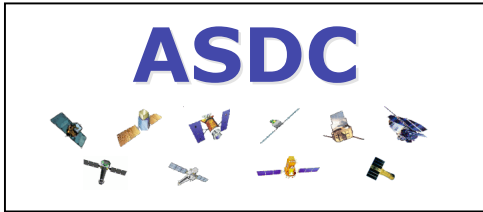
- ASDC hosts a mirror of the level 1 (preprocessed) data of the XMM public archive, calibration files and SW.
- ASDC is the official european mirror site of Chandra Observatory Archive.
- ASDC hosts also data from previous missions such as:
 - Rosat
 - ASCA
 - EXOSAT



ASDC Activities: BeppoSAX

The BeppoSAX Archive:

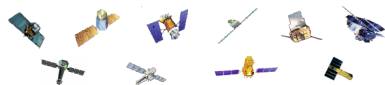
- Operative life Apr. 1996 - Apr. 2002: about **1500** observation performed with both NFI and WFC. Raw data archive is composed by **2627** FOT for NFI and **2718** for WFC.
- WFC Archive reprocessing has been completed. Screened data and products (images, lc and spectra) are available via WEB for the first time for WFC.
- NFI Archive reprocessing is about at 70% data and products will be available for the end of 2006.



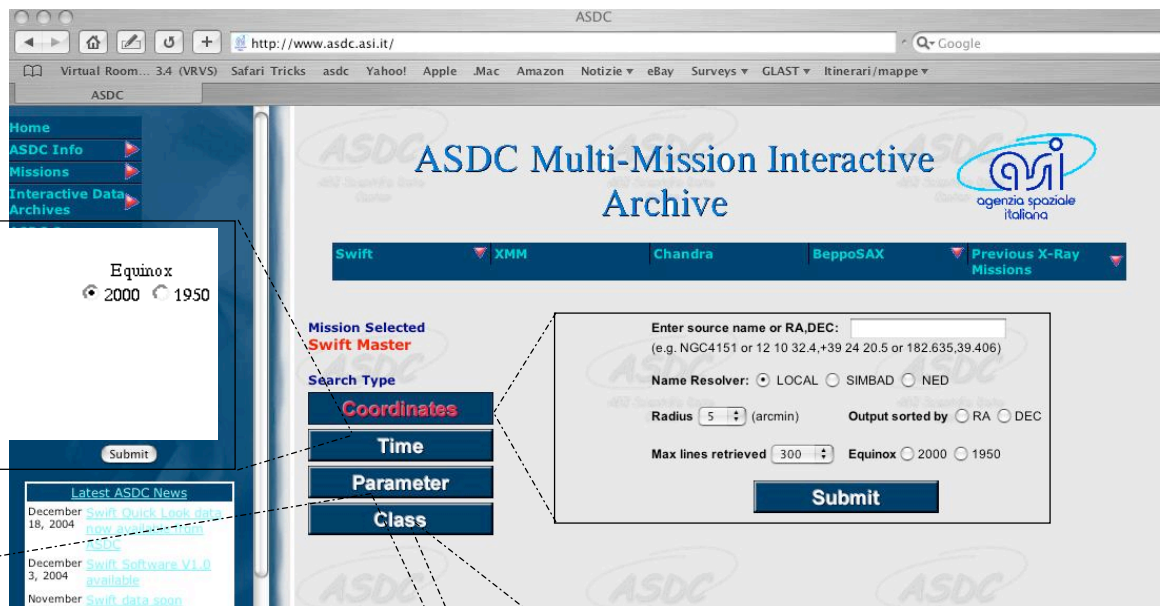
ASDC Swift and multi-mission Interactive Archive

A screenshot of a web browser displaying the ASDC Multi-Mission Interactive Archive. The browser's address bar shows the URL 'http://www.asdc.asi.it/'. The website features a navigation menu on the left with options like 'Home', 'ASDC Info', 'Missions', 'Interactive Data Archives', 'ASDC Source Catalogs', 'Tools', and 'Related Links'. Below the menu is a search section for 'Quick data retrieval' with a text input field and radio buttons for '2000' and '1950 Equinox'. A 'Submit' button is located below the search options. The main content area is titled 'ASDC Multi-Mission Interactive Archive' and includes the logo of the 'agenzia spaziale italiana'. A horizontal menu allows users to select a mission: 'Swift', 'XMM', 'Chandra', 'BeppoSAX', and 'Previous X-Ray Missions'. Below this, there is a search form with the following fields: 'Mission Selected' (set to 'Swift Master'), 'Search Type' (with buttons for 'Coordinates', 'Time', 'Parameter', and 'Class'), 'Enter source name or RA,DEC' (with a text input and examples), 'Name Resolver' (radio buttons for 'LOCAL', 'SIMBAD', 'NED'), 'Radius' (a spinner set to '5' arcmin), 'Output sorted by' (radio buttons for 'RA', 'DEC'), 'Max lines retrieved' (a spinner set to '300'), and 'Equinox' (radio buttons for '2000', '1950'). A large 'Submit' button is at the bottom right of the search form. The left sidebar also contains a 'Latest ASDC News' section with several news items dated from November to December 2004.

ASDC



ASDC Multi-Mission Archive



Start Date: 01-06-1996 (dd-mm-yyyy) End Date: 30-09-1996 (dd-mm-yyyy) Equinox: 2000 1950

Output sorted by: RA DEC Time Max lines retrieved: 300

Submit

Mission Selected: **Swift Master**

Search Type: **Coordinates** (selected), Time, Parameter, Class

Enter source name or RA,DEC: (e.g. NGC4151 or 12 10 32.4,+39 24 20.5 or 182.635,39.406)

Name Resolver: LOCAL SIMBAD NED

Radius: 5 (arcmin) Output sorted by: RA DEC

Max lines retrieved: 300 Equinox: 2000 1950

Submit

Allowed Parameters: PI Name (dropdown) String or value(s) to search: Piro

String type: embedded str exact wildcard string (e.g. ngc*)

Output sorted by: RA DEC Max lines retrieved: 300 Equinox: 2000 1950

Submit

Stars-all types Early type stars Output sorted by: RA DEC BII

Late type stars Pulsars Correlation radius (arcmin): 5 10 20 30

RSCVn Seyfert Galaxies

AGN-all types R-Loud QSOs

R-Quiet QSOs BL Lacs

Clusters of galaxies Galaxies

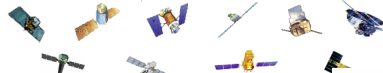
Cataclismic Variables White Dwarfs

X-ray binaries SNR

Submit

Catalog used for cross-correlation BLLACS - Padovani & Giommi BL Lac catalog

ASDC



ASDC Multi-Mission Archive

NetScape: Catalog entry window

Web searches centered on
Ra=07 59 21.3 Dec=-60 48 55.0

SDC Catalogs Search radius (arcmin) 1 Submit

PhotoCatalogs
IRCatalogs
DFI/Catalogs
UV/Catalogs
XMM-Newton
CometaryCatalogs
AGN/Catalogs
WGA/Catalogs

AstroBrowse STSC/MAST NED

Search radius 2 arcmin

Interactive Data Access

Optical/Radio data X-ray data from SDC

Opt-DSS from ESO BeppoSAX ROSAT
ASCA Einstein
SuperCOSMOS Sky Survey EXOSAT Chandra
XMM-Newton

ESO
NVSS from NRAO

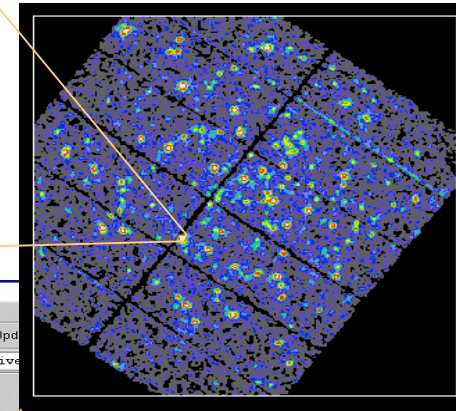
Details for entry PNJ075921-604855

ra 119.83875
ra 07 59 21.3
decdeg -60.81528
dec -60 48 55.0
count_rate 0.0155
snr 12.92
x_pix 16568
y_pix 23835
instrument EPN
name PNJ075921-604855
offset 9582.79
offsec 479
offmin 7.98
classification star A0
comment -----
yn 1

On-line analysis

Analysis Type Spectral Submit

Extraction Radius (arcmin) Default



NetScape: XMM-ASDC archive

Members WebMail Connections BizJournal SmartUpd

Bookmarks Location: http://www.asdc.asi.it/xmmarchive

Back Forward Reload Home Search Netscape

Welcome to the ASDC XMM Interactive Archive
A Service of the ASI Science Data Center

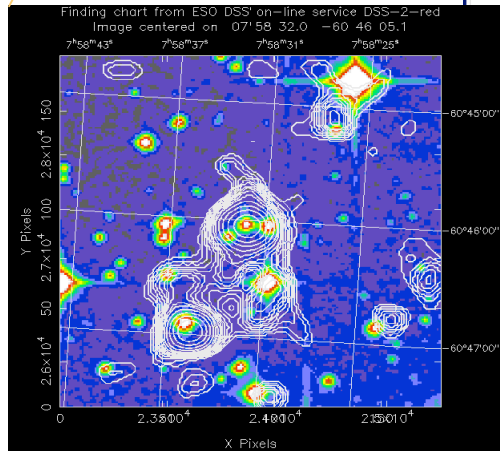
Obs_id: 0126511201
Target: NGC2516
PI: Dr Fred Jansen

Image preview
[Open](#) [Close](#)
Lightcurve preview
[Open](#) [Close](#)

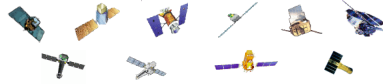
Available data sets

	instrument	exposure	filter	mode	interactive access	events access	image access
	EMOS1	27456	Thick	PrimeFul	Interactive access	Download events file	Download fits image
	EMOS2	27430	Thick	PrimeFul	Interactive access	Download events file	Download fits image
	EPN	29203	Thick	PrimeFul	Interactive access	Download events file	Download fits image

[Access to catalog and data products](#)



ASDC



Euro-VO

Science

- Software
- Recipes User Manual
- Scientific Workflows
- Science Cases
- Scientific Papers
- Science Advisory Committee
- Helpdesk

Technical

- Software
- Registries
- Tutorials
- IVOA Standards →

Data Centres

- About

About

- Introduction
- Presentations
- Structure
- Partners
- Q&A
- News
- Vacancies
- EC Support

Press Room

- Media

Links

- Search
- Euro-VO Internal →
- Calendar
- AVO site (2002-2004) →
- Contacts

Member of



The European Virtual Observatory EURO-VO

The EURO-VO project aims at deploying an operational Virtual Observatory in Europe. Its objectives are technology take-up and VO compliant resource provision, building the technical infrastructure and to support its utilization by the scientific community.

From AVO to EURO-VO

The Astrophysical Virtual Observatory (AVO) together with further national VO projects created the foundations of a regional-scale infrastructure by conducting a research and demonstration programme on the VO scientific requirements and technologies. AVO was a collaborative project of European organizations in 2002-2004 and was jointly funded by the European Commission under the 5th Framework Programme (HPRI-CT-2001-50030). The EURO-VO work programme is the logical next step from AVO as a Phase-B deployment of an operational VO in Europe.

News & Highlights

VO session at the IAU



17-18 and 21-22 August, 2006 Virtual Observatory session at the IAU General Assembly, Prague. The Virtual Observatory in Action: New Science, New Technology, and Next Generation Facilities

[Call for Papers](#)

EURO-VO Workshop 2005



27 June - 1 July, 2005 The EURO-VO Project held a workshop on VO technologies and standards explicitly designed for data centres and large projects to acquire the knowledge and experience necessary to allow them to become publishers in the VO. There were 120 participants, affiliated with 47 institutions in 16 countries and representatives of 11 IVOA member projects.

[Workshop Page](#)

AVO Demo 2005



January 25-26, 2005 The final demo of the AVO project - "Toward the EuroVO" - has been held at ESAC, Villafraanca del Castillo, Spain. The demo showcased new workflow techniques and focus on two scientific scenarios, i.e., the evolution of AGB stars to Planetary Nebulae and Star Formation Histories in Galaxies.

[AVO Demo 2005](#)

last updated: 05-May-2006



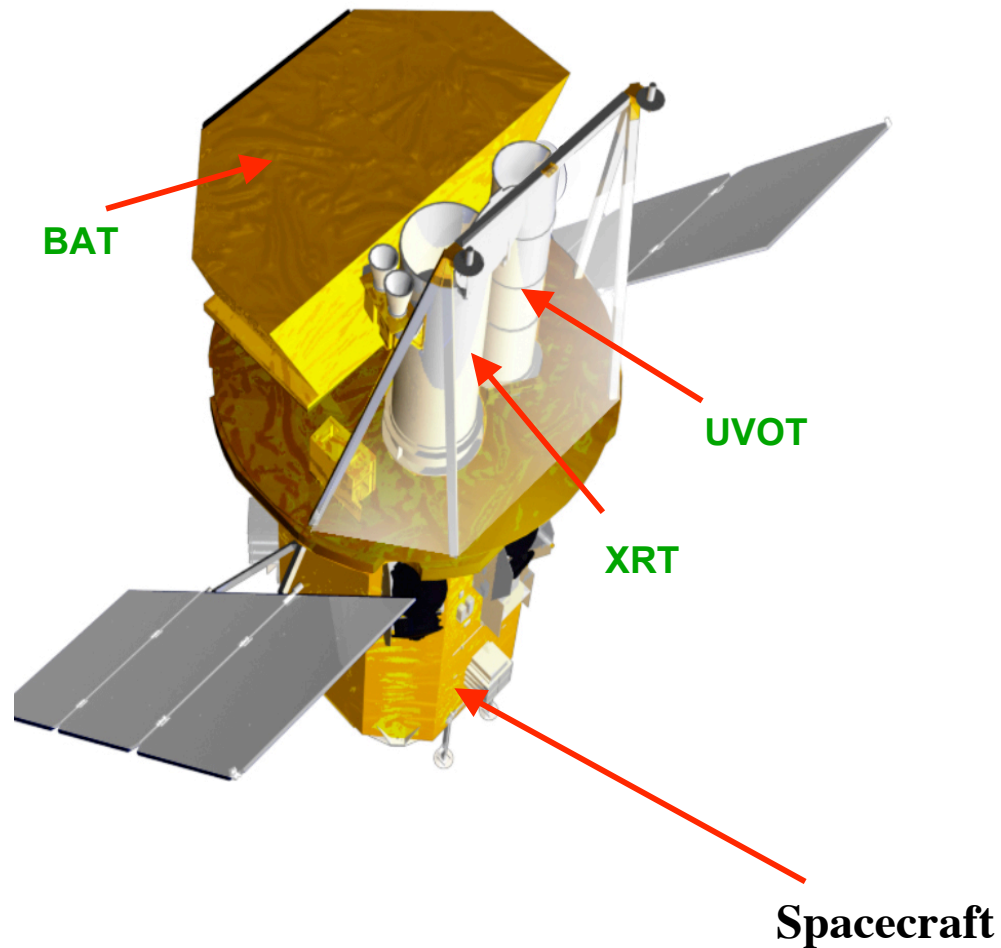


ASDC Activities: Swift

- ASDC is mainly involved in Swift activities:
 - XRT data analysis software
 - Scientific data quality check and validation
 - Mission data archive
 - Scientific activities within the Team (XBS, BA)
 - Support to the italian community
 - Scientific activities on GRB science and other programs (e.g. Serendipity Survey, Blazars)

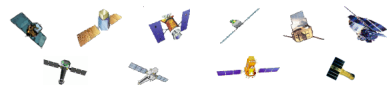


Swift Instruments

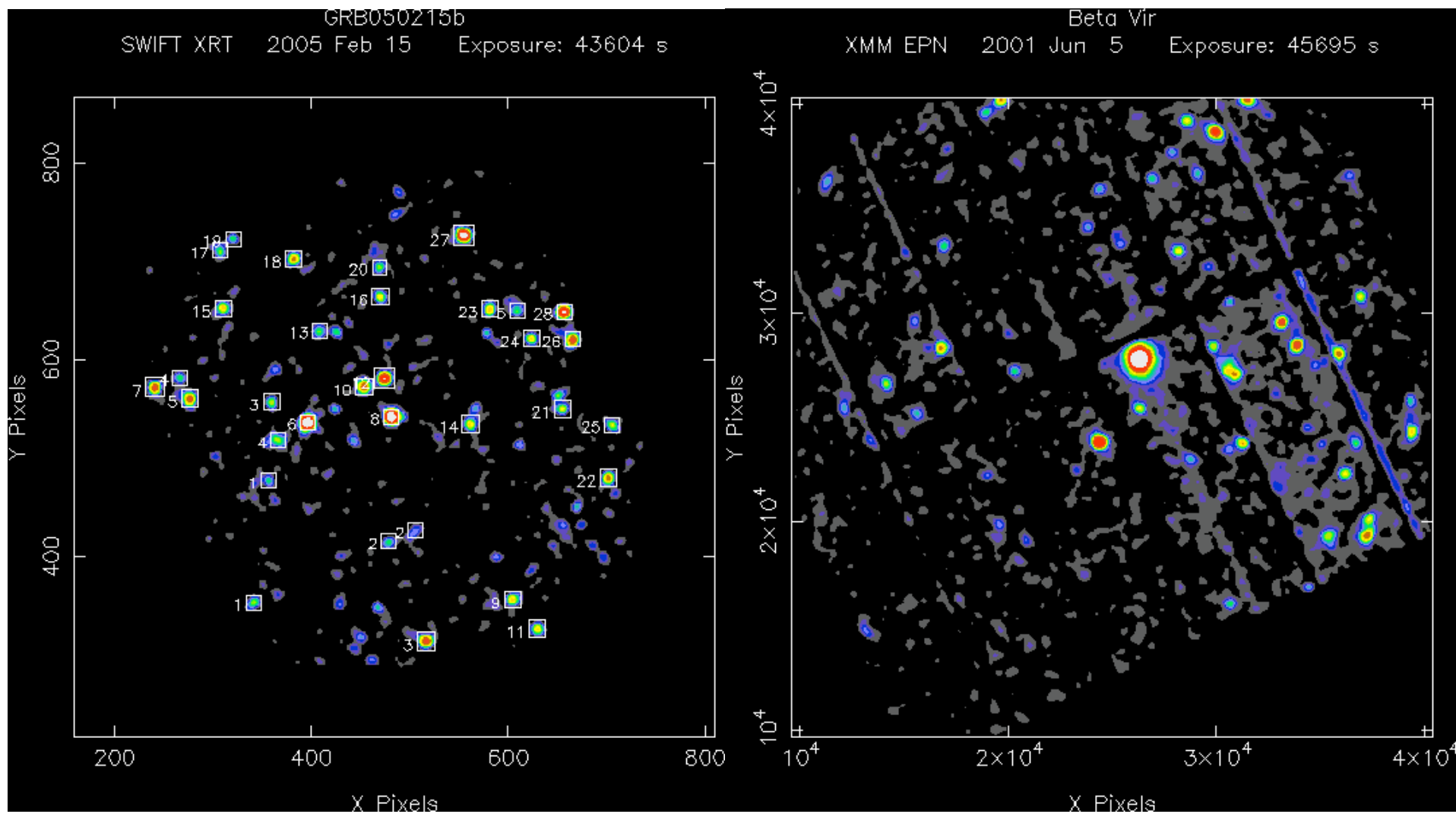


- **Burst Alert Telescope (BAT)**
 - New CdZnTe detectors
 - Detect >100 GRBs per year depending on $\log N - \log S$
 - Most sensitive gamma-ray imager ever
- **X-Ray Telescope (XRT)**
 - Arcsecond GRB positions
 - CCD spectroscopy
- **(UVOT) UV/Optical Telescope**
 - Sub-arcsec imaging
 - Grism spectroscopy
 - 24th mag sensitivity (1000 sec)
 - Finding chart for other observers

ASDC



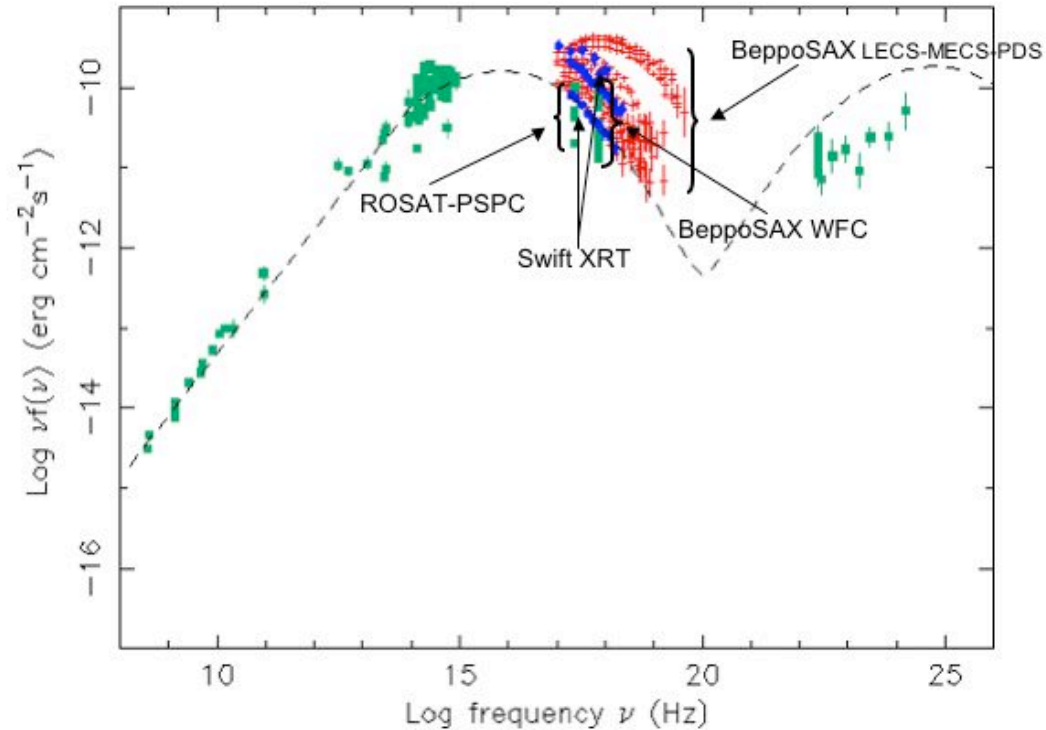
Swift XRT vs XMM





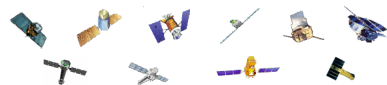
The Swift Blazar project

MKN 421



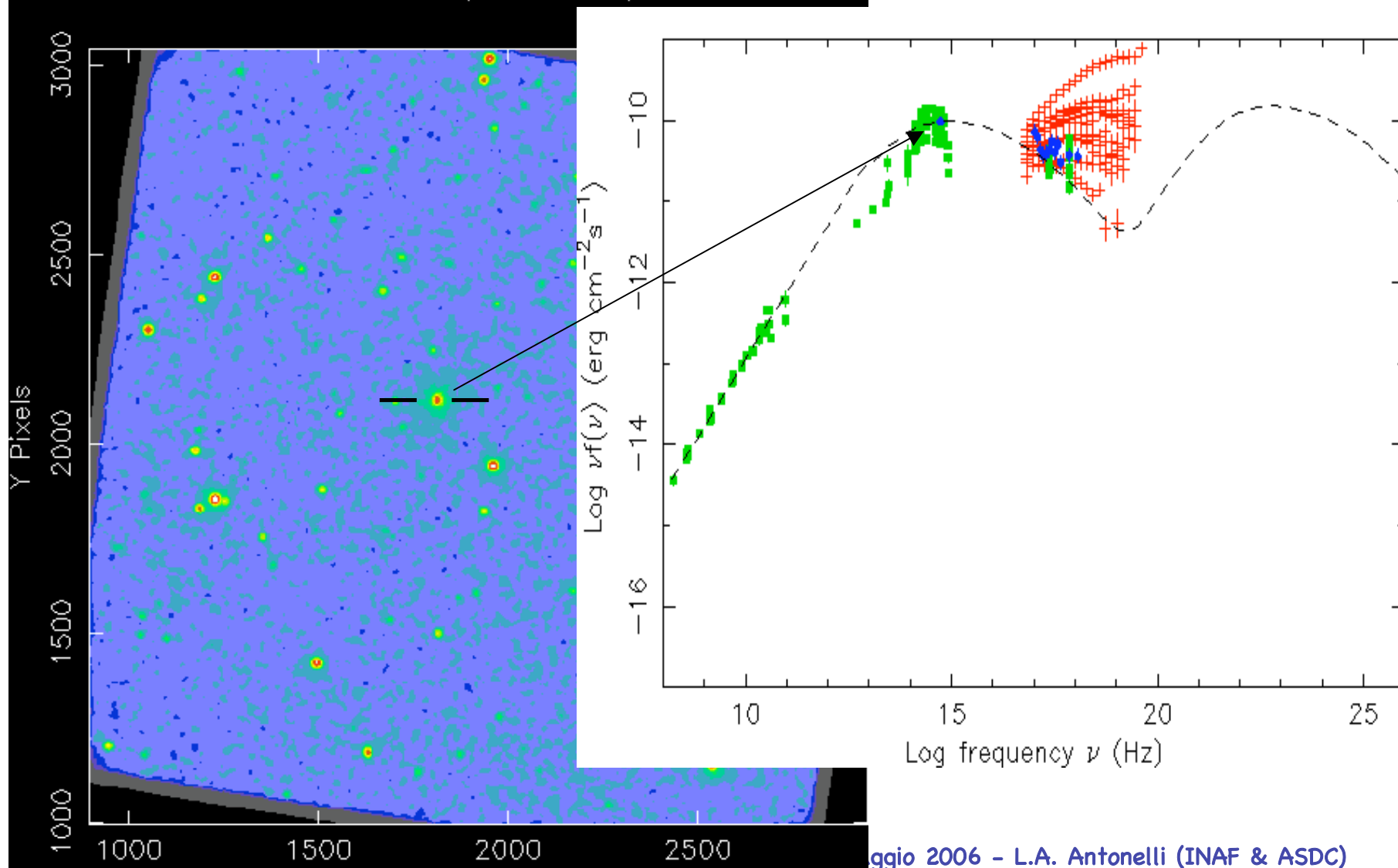
See details on posters by Giommi et al. (12) and by Maselli et al. (17)

ASDC

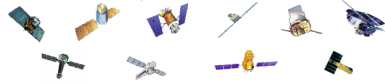


The Swift Blazar project: MKN501

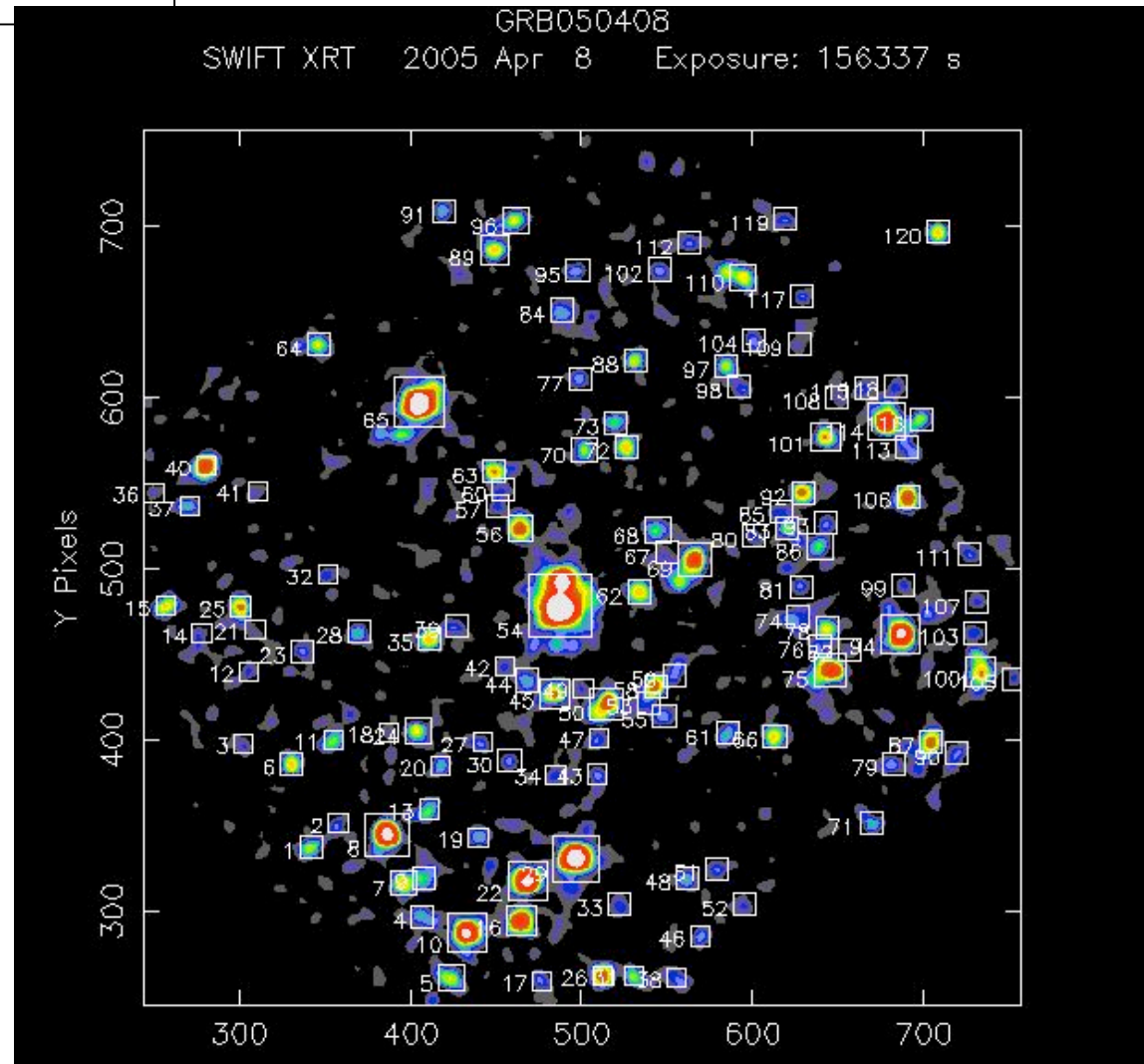
SWIFT UVOTA 2005 Apr 21 Exposure: 26 s



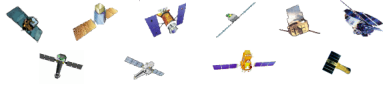
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A Swift-XRT deep Field



ASDC



The LogN-LogS from two GRB fields GRB050215b (total exposure: 44 ks) and GRB050406 (156 ks the deepest XRT exposure so far)

0.5-2.0 keV band

Powerlaw spectrum

Phot index $\Gamma = 1.7$, $NH=2 \times 10^{20}$

1 cts/s = $9 \cdot 10^{-12}$ erg/cm²/s

Flux limit $\sim 3 \times 10^{-15}$ erg/cm²/s

300 sources/sqdeg

Flux limit $\sim 7 \times 10^{-16}$ erg/cm²/s

800 sources/sqdeg

No Vignetting correction!
($\sim 20\%$ at the edge of FOV)

2.-10. keV band

Powerlaw spectrum

Phot index $\Gamma = 1.7$, $NH=2 \times 10^{20}$

1 cts/s = $7 \cdot 10^{-11}$ erg/cm²/s

Flux limit $\sim 2 \cdot 10^{-14}$ erg/cm²/s

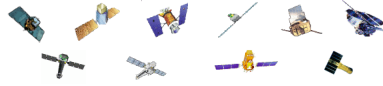
160 sources/sqdeg

Flux limit $\sim 6 \cdot 10^{-15}$ erg/cm²/s

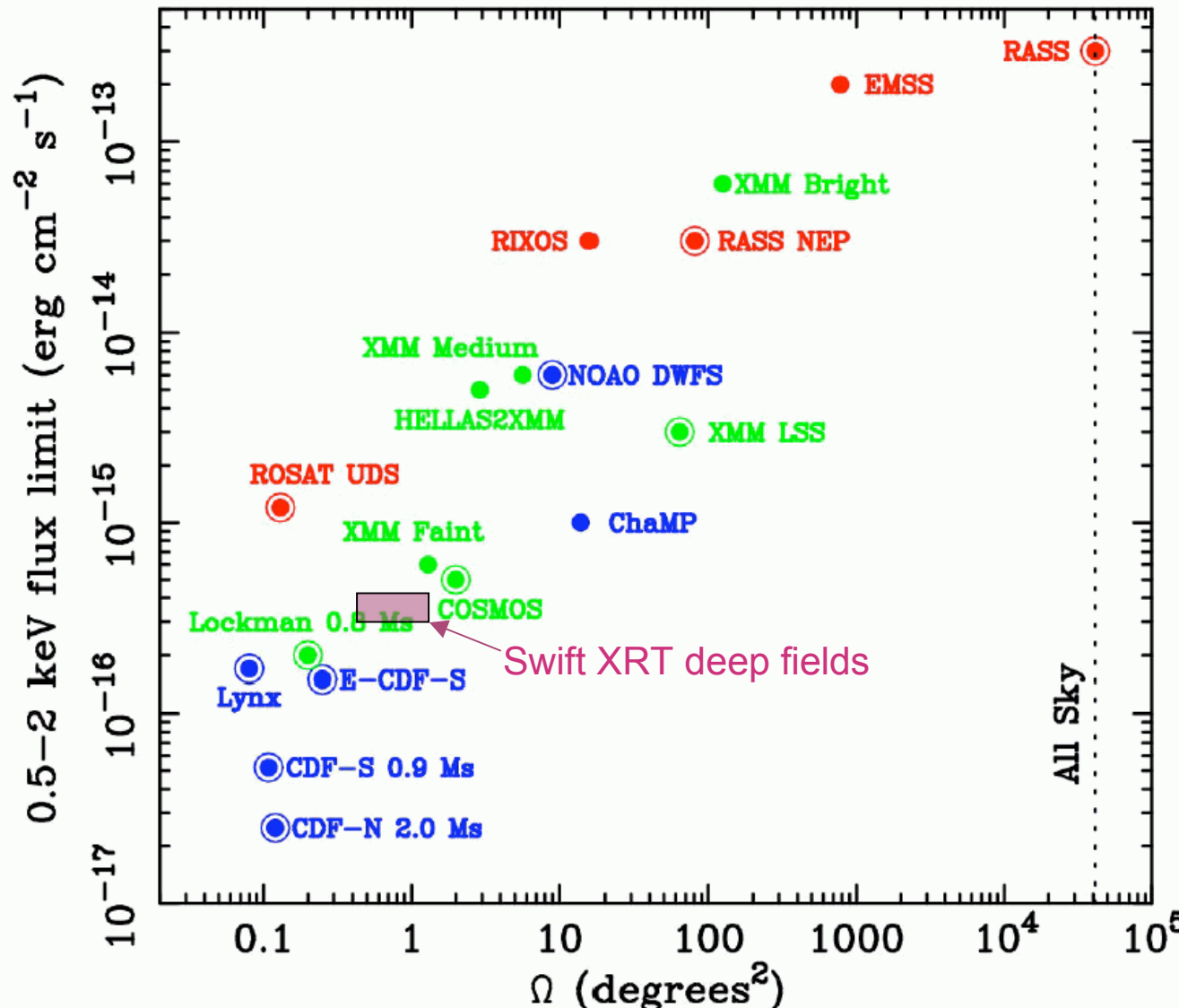
500 sources/sqdeg

No Vignetting correction!
($\sim 20\%$ at the edge of FOV)

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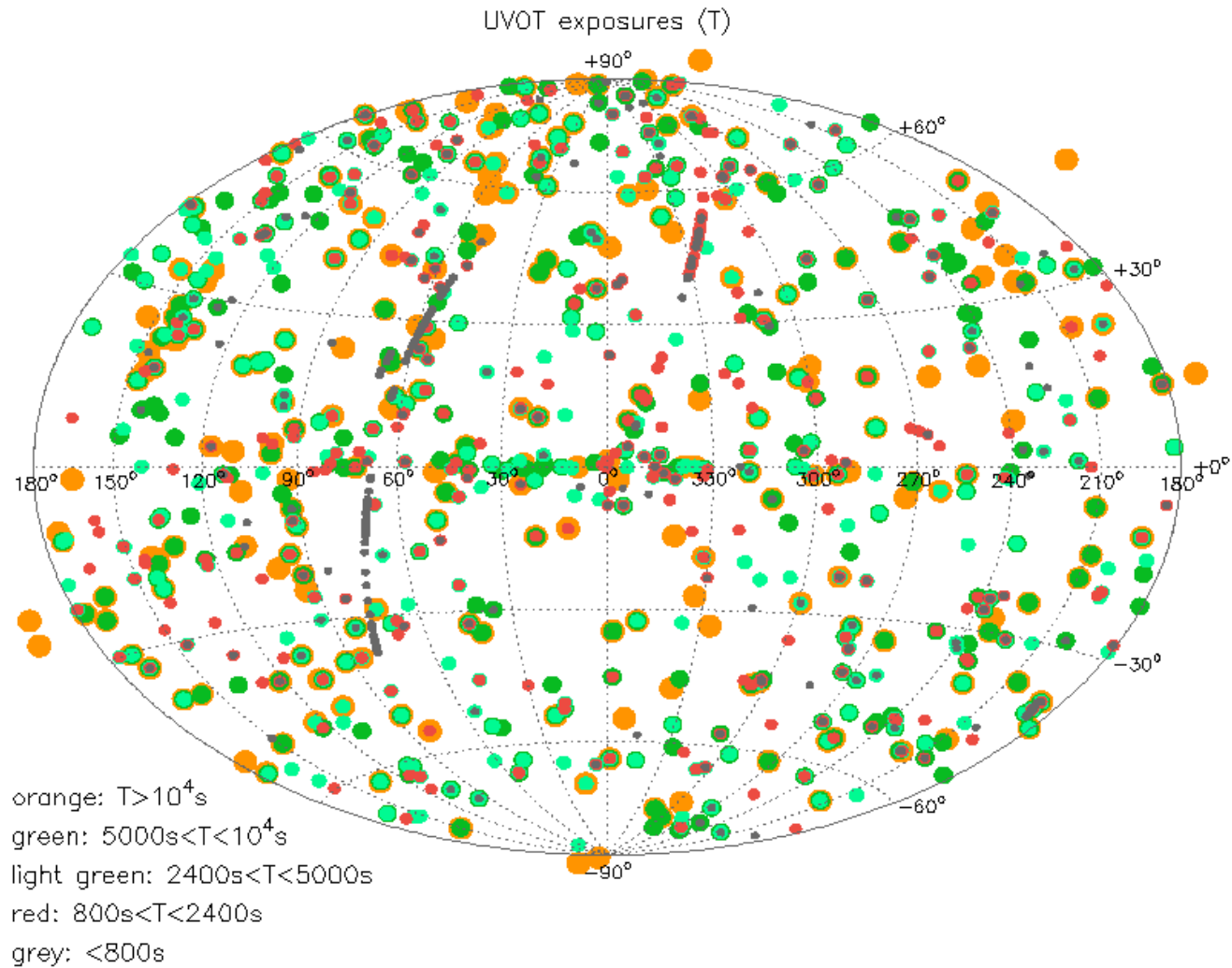
Swift XRT deep fields Comparison with other X-ray surveys

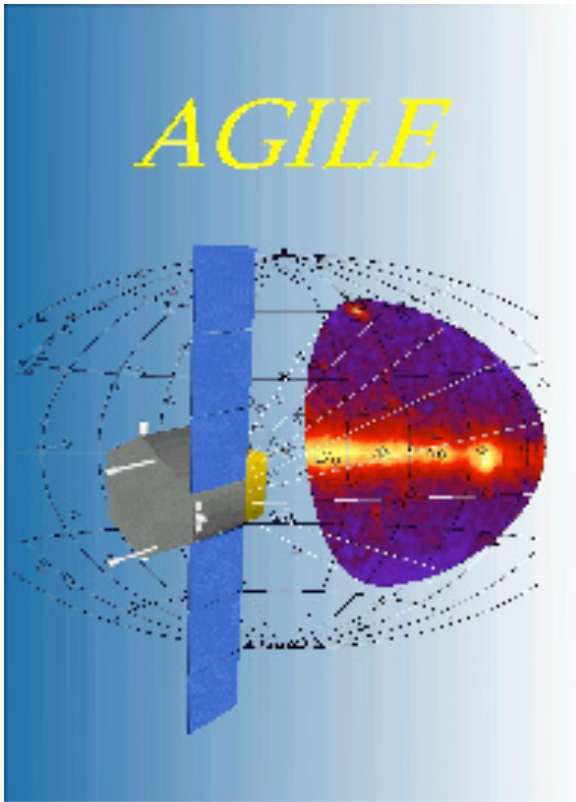


ASDC



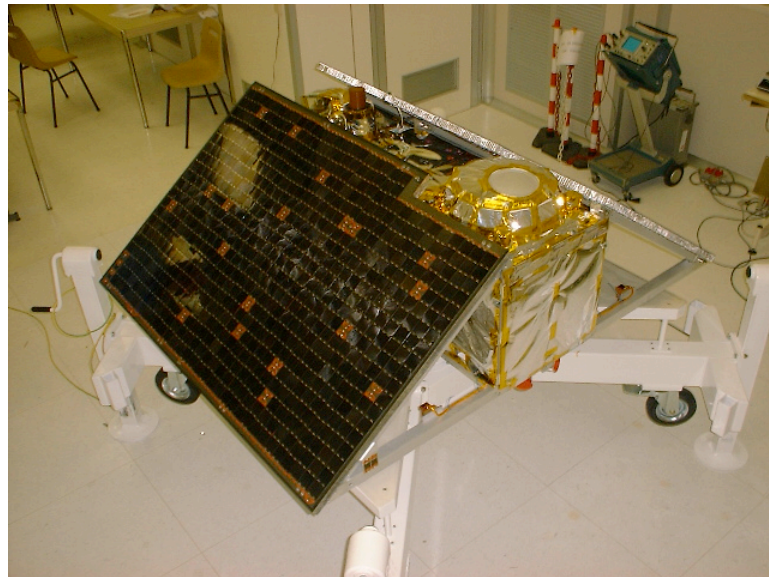
UVOT Survey





launch: end 2006

Italian small mission for gamma ray astronomy
Funded by ASI, proposed by INAF with participation of INFN



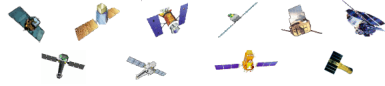


ASDC & AGILE

ASDC jointly with the AGILE team will perform:

- the quicklook data reduction analysis;
- the standard data reduction analysis;
- new source validation;
- complete data archiving;
- management of the AGILE Guest Observer Program;
- data distribution to the scientific community;
- management of the official WEB page of the AGILE Mission;
- preparation and maintenance of the official AGILE and SuperAGILE Source Catalogues.
- Publication of standard products (positions, fluxes, light curves and spectra) of SuperAGILE sources.

ASDC



ASDC & AGILE

The AGILE Mission

Announcement of Opportunity Cycle-1

Issue 1.0

18 May 2006

Prepared by
L.A. Antonelli, P. Giommi,
S. Mereghetti, M. Tavani

On behalf of



Data Challenges

GLAST DC2: 55 days worth of realistic simulated data.

DC2 data analysis: work in progress @ ASDC

P. Giommi, E. Cavazzuti, S. Cutini, D. Gasparrini, C. Pittori

To-Do: from the **Blazars and other AGN** Confluence page:

Blazar catalog, sample definition

Once the list of GLAST sources is available, three steps are foreseen:

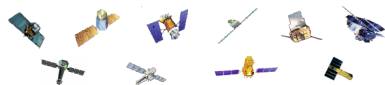
a) A source subset will readily be associated with known sources (e.g. blazars from existing catalogs);

b) Some new GLAST sources will be identified via cross-correlation with radio, X-ray... catalogs.

The candidate optical counterparts will be observed. The spectroscopy will confirm their identity as a blazar, and lead to the redshift and luminosity determination.

c) Some information about the blazar contents of the remaining subset can be obtained by statistical studies.

ASDC



GLAST DC2 Source Catalog

The GLAST DC2 Catalog at ASDC - Netscape

http://www.asdc.asi.it/glast/dc2cat/

Available parameters

- Name
- Ra Dec
- Significance
- Flux(>100MeV)
- Radio_1(1.4GHz)
- Class
- Other name
- sp_index
- EGRET name
- DistCounterpart
- Redshift
- XFlux

GO

GLAST DC2 source catalog and data access at ASDC

Work in progress!
this page is subject to frequent updates

BL Lacs **FSRQs** **Radio Galaxies** **Pulsars** **GRB's ?** **Unidentified**

Reset

Entry number		DC2 name	RA (J2000.0)	Dec (J2000.0)	Gamma flux (ph/cm ² /s E>100 MeV)	Source classification	Other source names	Egret name	
			hh mm ss.d	dd mm ss.d	GLAST-DC2	Browse Classif			
Subset selection mode: inclusive		↑ ↓	↑ ↓	↑ ↓	↑ ↓ Stat	↑ ↓	↑ ↓	↑ ↓	
1 <small>Select</small>	Entry details	DC2 data access	MRF0021	00 10 44.5	+73 10 26.4	2.51e-7	SNR	CTA1,SNR119	3EG J0010+
2 <small>Select</small>	Entry details	DC2 data access	MRF0324	00 04 58.8	-52 27 00.0	1.29e-7	Unid. radio source	-----	-----
3 <small>Select</small>	Entry details	DC2 data access	MRF0301	00 10 39.6	+02 47 27.5	9.62e-8	Unid. radio source	-----	-----

ASDC

GLAST DC2 access window - Netscape

DC2 name MRF0294
 Other name PKS 0208-51
 Source classification QSO RCloud fl...
 EGRET Name 3EG J0210-50
 RA (J2000.0) 02 10 50.4
 Dec (J2000.0) -50 59 20.3
 Flux (> 100MeV) 0.0000261

Standard Products

- Image
- Count map
- XSPEC spectrum
- XSPEC unfolded spectrum
- Lightcurve provided by B. Lott
- Likelihood spectral fits provided by L. Reyes
- SED
- SED with DC2 data

Download fits files

Close Window

Flux (arb. units) $\times 10^{-4}$

MRF0294 0210-5059

Time (days)

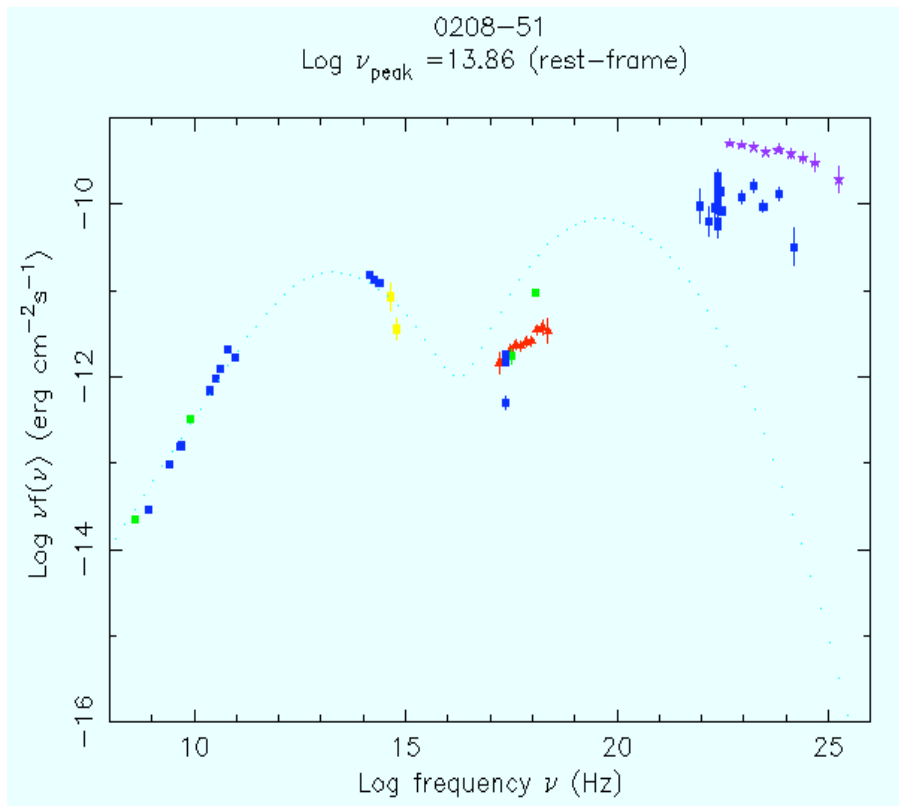
Identified

Subset selection mode:						GLAST-DC2	Browse Classif	Other source names	Egre name
inclusive									
1 Select	Entry details	DC2 data access	MRF0021	00 10 44.5	+73 10 26.4	2.51e-7	SNR	CTA1,SNR119	3EG J0010+
2 Select	Entry details	DC2 data access	MRF0324	00 04 58.8	-52 27 00.0	1.29e-7	Unid. radio source	-----	-----
3 Select	Entry details	DC2 data access	MRF0301	00 10 39.6	+02 47 27.5	9.62e-8	Unid. radio source	-----	-----



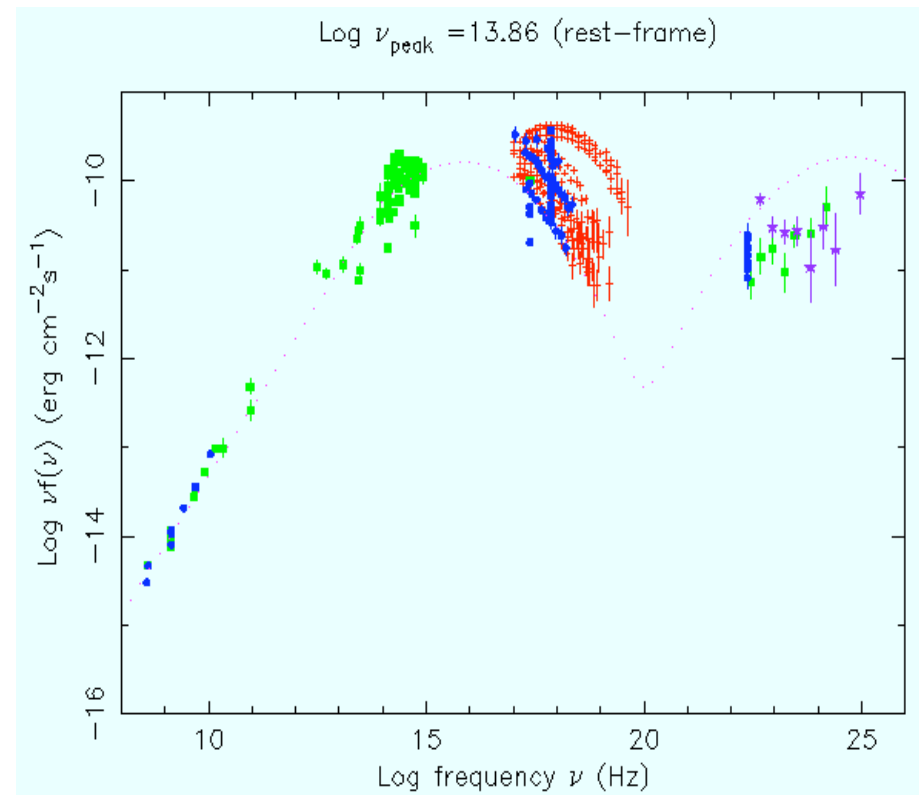
MRF0294

(purple stars=DC2 data)



MRF0404

(purple stars=DC2 data)



DC2 Update (April 21 2006) - DC2 - SLAC Confluence - Netscape

Back Forward Reload Stop [https://confluence.slac.stanford.edu/display/DC2/2006/04/21/DC2+Update+\(April+21+2006\)](https://confluence.slac.stanford.edu/display/DC2/2006/04/21/DC2+Update+(April+21+2006)) Print

Home Bookmarks Google GLAST ASDC WEBMAIL @ Roma2.i... ASDC ASI Webmail Libero INFN - Istituto Nazio... Dipartimento di Fisi...

Postings in the User Forum since the Apr 11 update

LAT Data Issues

[3EG source catalog](#) contains a ds9 region file for comparison with LAT data.

Diffuse Issues

[Galactic Diffuse](#) analysis results web page contains spectral and spatial comparisons between the DC2 data and the DC2 diffuse emission model plus extragalactic diffuse emission Galprop for low-latitude and high-latitude regions of the sky.

Science Working Groups

Blazar and other AGNs

Among recent DC2-related results presented at Blazar group VRVS meetings is an [astonishingly complete interface to the DC2 data via the DC2 source catalog](#) prepared at the ASI Science Data Center.

Gamma Ray Bursts

A [table of GRBs in DC2](#), starting with the GBM data, is under development.

Pulsar, SNR and Plerions

Results from a [blind search for pulsations](#) from the sources in DC2 source list, based on an algorithm developed at UCSC, have been posted in the [SCIGRPS:Data Challenge 2 Activities](#) area.

Calibration and Analysis

An algorithm under development for determining source positions using a likelihood analysis of HEALPix maps was presented at recent C&A VRVS meetings; see [here](#) and [here](#).



Much other work in progress on:

- background subtraction
- estimate of gamma-ray flux from 94Ghz data
- XRB and low latitude gamma-ray sources (in collaboration with P. Santolamazza, F. Verrecchia)
- Galaxy Clusters (in collaboration with S. Colafrancesco)
- GRBs (in collaboration with L.A. Antonelli)