

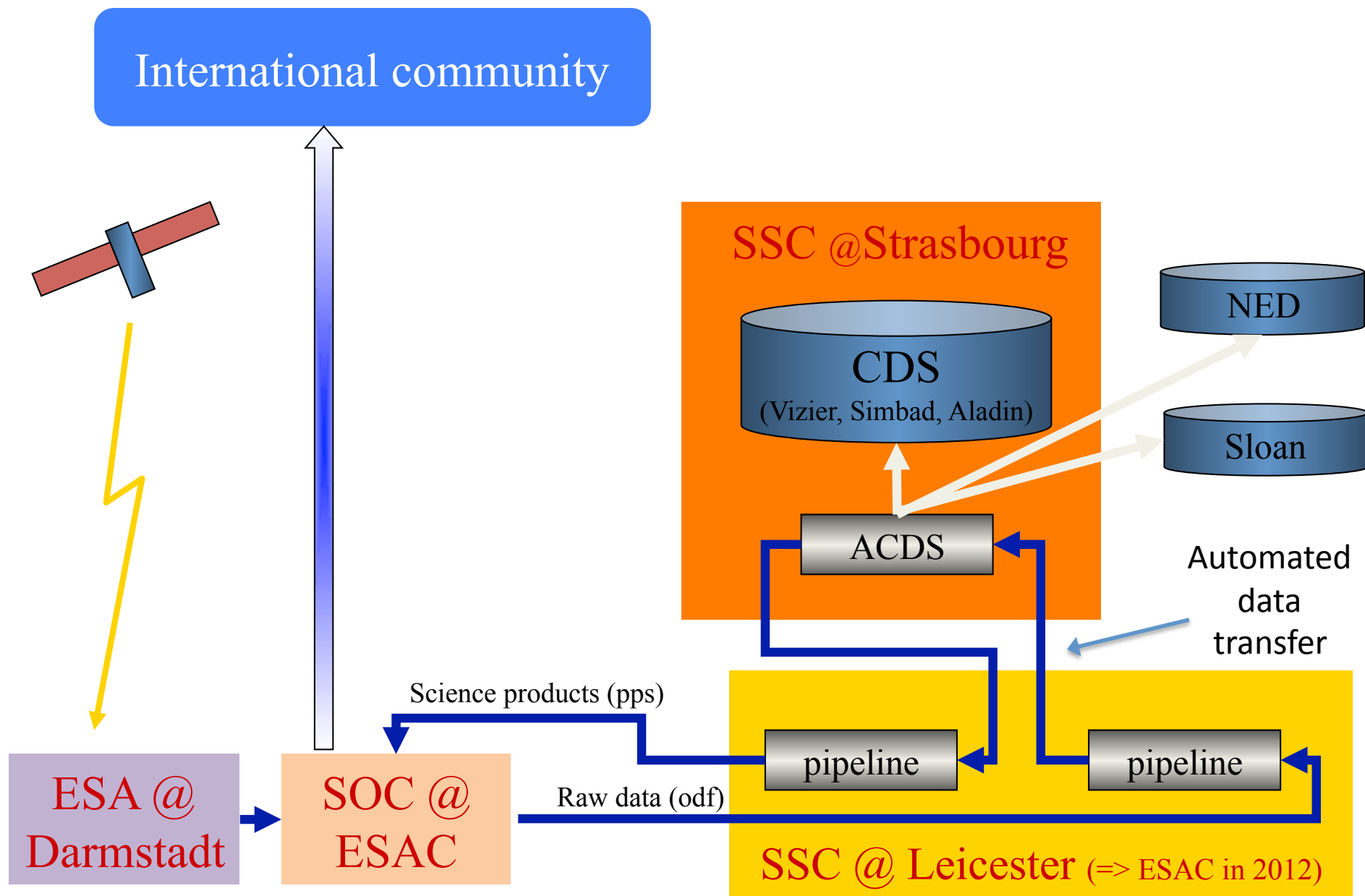
Experience acquired in Strasbourg  
from the XMM-Newton  
Survey Science Centre.

*C. Motch*

# SSC@Strasbourg

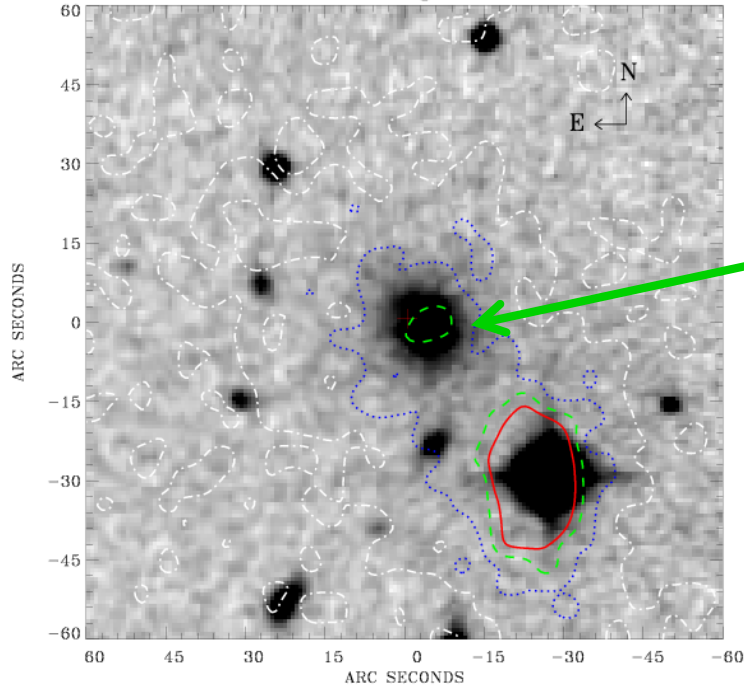
- Pipeline processing of all observational data.
  - Strasbourg has developed the part of the SSC pipeline aiming at proposing identifications for every X-ray EPIC source.
    - Correlation with >200 selected archival catalogues at CDS (VizieR & Simbad) and NED, Chandra catalogue, etc...
    - Produce finding charts based on Aladin & SDSS plate collections + ROSAT/EPIC overlays (+ fits files)
  - Pipeline runs in Strasbourg and is interfaced with the main XMM pipeline in ESAC.

# The XMM-Newton Ground Segment (view from Alsace)



# Strasbourg's pipeline graphical products

EPIC source finding chart ACDS V6



Principal Investigator :  
Dr Walter Gear

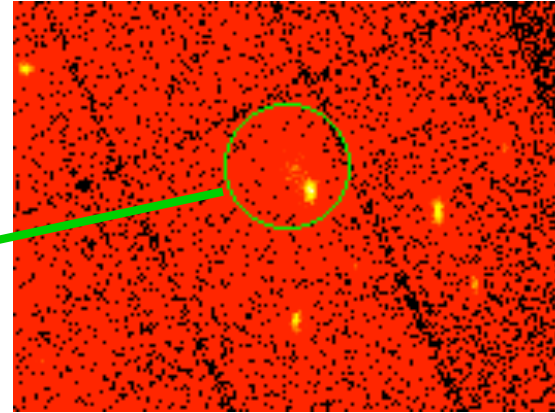
XMM target name :  
cfrs10h

OBS ID : 41170201  
Source number : 13

X-ray coordinates :  
 $\alpha$  : 09 59 57.06  
 $\delta$  : +25 16 21.2

Center coordinates :  
 $\alpha$  : 09 59 57.06  
 $\delta$  : +25 16 21.3

Plate reference :  
Origin : POSSII  
Plate : 499  
Color : J  
Pixel : 1.02 "/pix

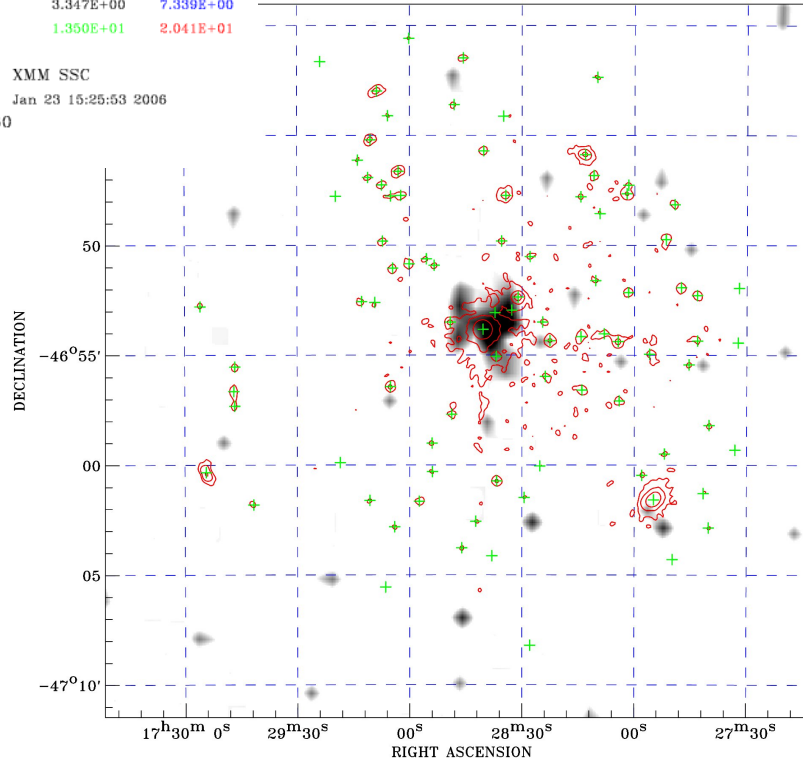


## XMM/EPIC – ROSA overlay

Contour levels (counts) :  
3.347E+00 7.339E+00  
1.350E+01 2.041E+01

XMM SSC  
Jan 23 15:25:53 2006

PDF XMM RASS image ACDS V6



Principal Investigator :  
Prof Jurgen Schmitt

XMM target name :  
GJ 674

Observation ID :  
0551020101

Epic image :

$\alpha$  : 17 28 46.08  
 $\delta$  : -46 55 16.1

Energy band : 0.2–12.0 keV

MOS1 : 20677 s  
MOS2 : 21306 s  
PN : 18623 s

Contour levels (counts) :  
 $2\sigma$  : 3.181E+00  $7\sigma$  : 7.401E+00  
30 $\sigma$  : 2.682E+01

RASS image :  
Observation : 932535p  
Instrument : PSPCC  
 $\alpha$  : 17 15 51.12  
 $\delta$  : -45 09 0.0

XMM SSC

Oct 13 03:00:24 2008

RASS image gray scale (Log) :



⊙ Epic image contour levels at 2, 7 and 30 $\sigma$   
+ Detected Epic sources

1 17 28 40.403 -46 53 49.77

[Finding Chart for this source](#)

RADEC_ERR	EP_TOT	EP_EXTENT	EP_EXT_ML	EP_HR1	EP_HR2	EP_HR3	EP_HR4
0.04	1.775e+00 ± 1.049e-02	0.00	0.00	0.29 ± 0.01	-0.59 ± 0.01	-0.83 ± 0.01	-0.98 ± 0.02

CAT_NAME	CAT_ENTRY	query	RA H:M:S (J2000)	DEC D:M:S	ERR (")	D_EPIC_CAT (")	CAT_MEAS selected measure	CAT_VAL	CAT_NUM
GSC	8230002332522		17 28 40.689	-46 53 52.87	0.35	1 sig	4.3 Rmag	14.66	1033
MEX-AC	599024		17 28 40.709	-46 53 53.06	0.10		4.5 Jmag	11.748	1035
NOMAD	0431-0719379	---	17 28 40.708	-46 53 53.07	1.00		4.5 Iimag	14.060	1034
DENIS	J172840.7-465352		17 28 40.735	-46 53 52.84	0.87		4.6 Iimag	13.197	1037
DENIS	J172840.7-465352		17 28 40.727	-46 53 52.95	0.87		4.6 Iimag	12.868	1036
USNO	0375-32018609		17 28 40.848	-46 53 50.64	1.00		4.6 Bmag	15.5	1038
IRXS	J172839.7-465335		17 28 39.698	-46 53 35.52	8.58		16.0 Count	2.67e-01	1011
IRXS	J172839.7-465335		17 28 39.696	-46 53 35.52	8.58		16.0 Flux1	1.87e-11	1010
NEO	IRXS J172839.7-465335	2	17 28 39.700	-46 53 35.00	13.26		16.4 nref	1	1012
CCTP	3958.00		17 28 39.862	-46 53 33.23	52.33		17.4 pi	0.2168	1016
CNS3	61.674		17 28 37.354	-46 53 00.95	24.71		58.0 Vmag	9.37	908
CCTP	3957.00		17 28 31.086	-46 52 21.69	52.33		129.9 pi	-0.0042	561

2 17 27 54.875 -47 01 34.72

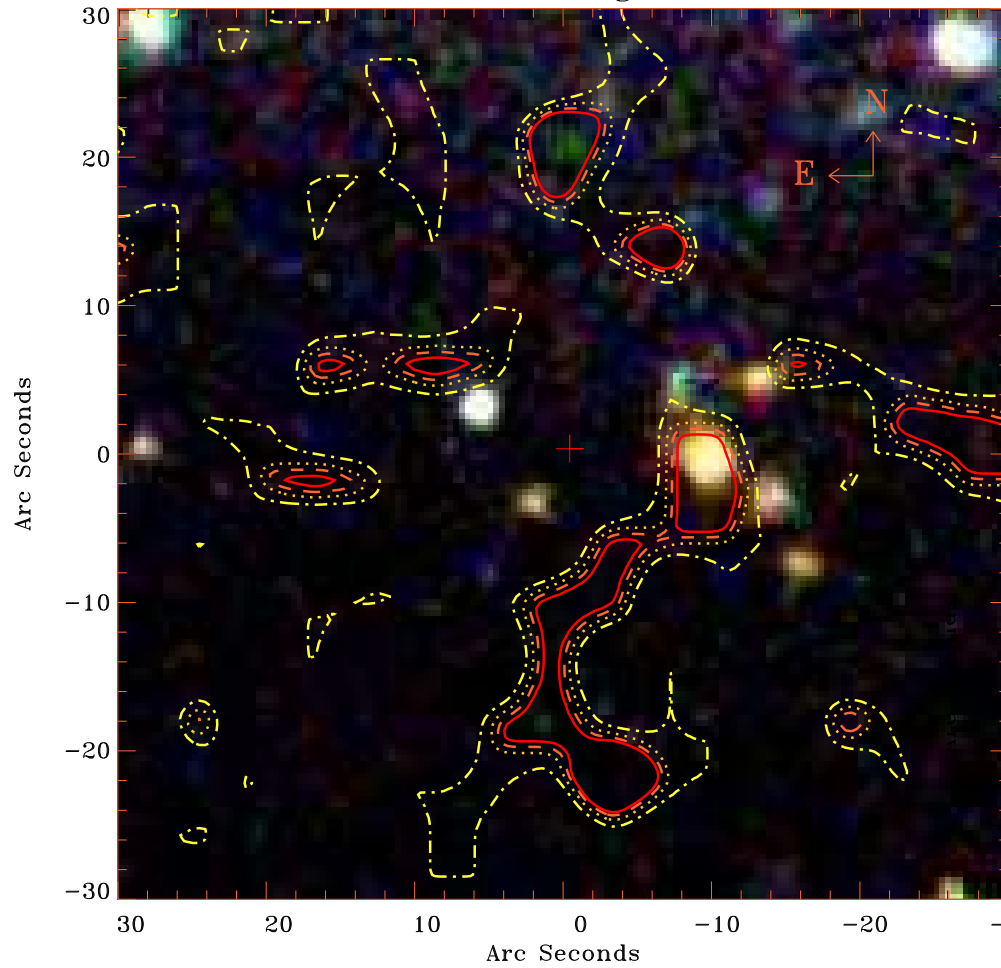
[Finding Chart for this source](#)

RADEC_ERR	EP_TOT	EP_EXTENT	EP_EXT_ML	EP_HR1	EP_HR2	EP_HR3	EP_HR4
0.10	1.140e+00 ± 1.239e-02	0.00	0.00	0.71 ± 0.02	0.44 ± 0.01	-0.17 ± 0.01	-0.21 ± 0.02

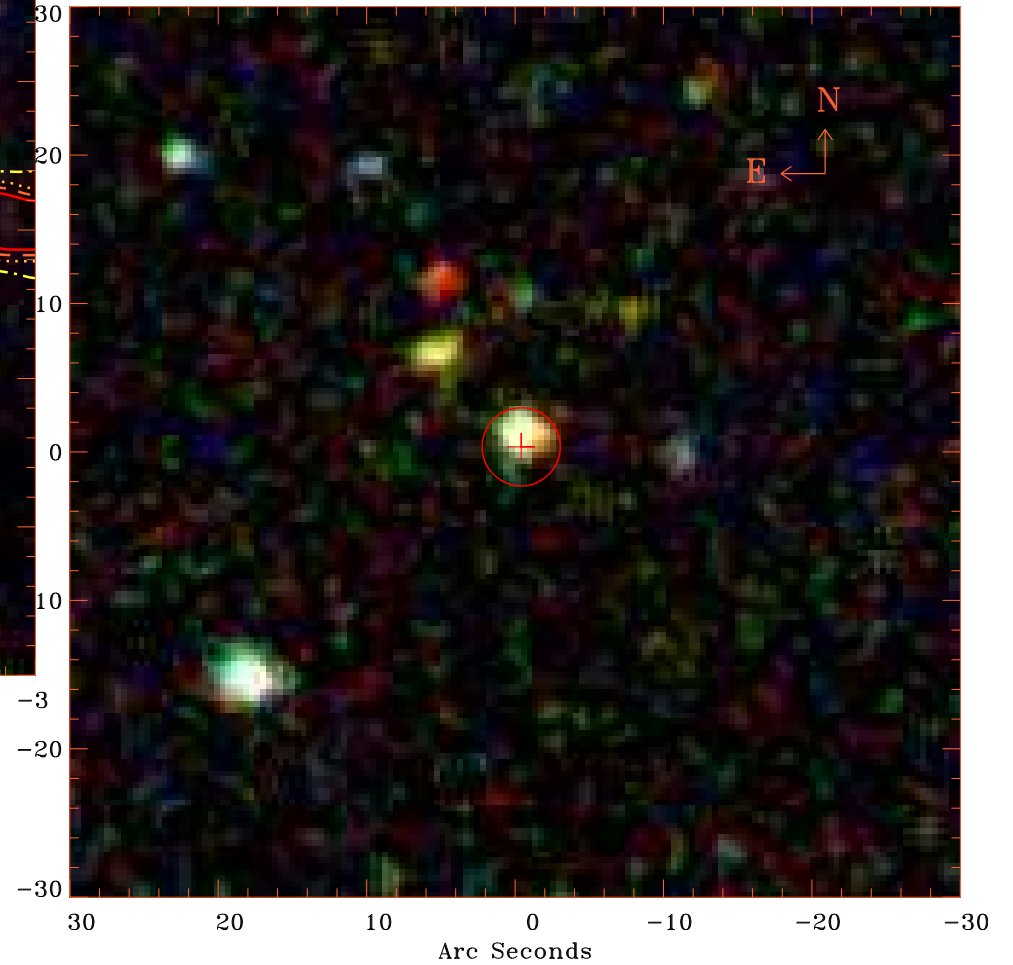
CAT_NAME	CAT_ENTRY	query	RA H:M:S (J2000)	DEC D:M:S	ERR (")	D_EPIC_CAT (")	CAT_MEAS selected measure	CAT_VAL	CAT_NUM
DENIS	J172754.8-470134		17 27 54.876	-47 01 34.78	0.87		0.1 Iimag	6.70	232
MEX-AC	599024		17 27 54.861	-47 01 34.28	0.07		0.5 Vmag	8.241	231
DENIS	J172754.8-470135		17 27 54.830	-47 01 35.14	0.87		0.6 Iimag	6.311	230
MEX-AC	J172754.8-470134		17 27 54.816	-47 01 34.38	0.06		0.7 Jmag	99.9	229
USNO	0375-31942864		17 27 54.813	-47 01 34.39	1.00		0.7 Bmag	6.660	228
SKY2000	J172754.81-470134.3 157832		17 27 54.813	-47 01 34.39	0.99		0.7 Vmag	25	227
SIMBAD	V5 V750 Ara		17 27 54.813	-47 01 34.39	0.01		0.7 nref	6.660	226
NOMAD	0429-0777911 0429-0700909	2	17 27 54.813	-47 01 34.39	1.00		0.7 Vmag	6.57	225
HIP	85467		17 27 54.813	-47 01 34.39	0.00		0.7 Vmag	6.60	224
GSC	82300023747		17 27 54.811	-47 01 34.39	0.00		0.7 Rmag	6.633	223
TYC	2916		17 27 54.811	-47 01 34.39	0.00		0.7 BImag	6.60	222
USNO	0429-0700909		17 27 54.811	-47 01 34.39	1.00		1.6 Bmag	12.9	234
USNO	0375-31943201		17 27 55.031	-47 01 35.05	1.00		2.7 Vmag	6.65	221
3067A	CD-4611530 MWC 259		17 27 56.170	-47 01 35.91	13.00		13.3 Fnu_12	5.72e-01	249
IRAS	17241-4659		17 27 56.170	-47 01 35.91	13.00		13.3 Hve1		251
IRAS1.23y	7443		17 27 56.175	-47 01 35.93	52.33				

# Sloan finding charts

EPIC source finding chart V7.0



EPIC source finding chart V7.0



# SSC@Strasbourg

- Experience in dissemination.
  - XCat-DB: provides access to:
    - XMM-Newton catalogues and associated pipeline data
    - Possible X-ray source identifications (pipeline output + identification and classification probabilities from a dedicated off-line process)
    - VO links (registered VO data provider, SAMP + interface to Aladin)
    - Based on the Saada generator (L.Michel)
  - etc...



- ✓ Programme FP7-Space sur 36 mois. 2013-2015.
- ✓ Strasbourg (SSC + CDS), Potsdam, Leicester, Madrid (INTA) et Santander.
- ✓ Objectifs:
  - ✓ Génération de SEDs pour une majorité de sources EPIC XMM-Newton du catalogue 3XMM DR5.
  - ✓ Utilisation de ces SEDs dans le cadre de plusieurs “science cases” (AGN, amas de galaxies et plan Galactique).
- ✓ Principaux développements:
  - ✓ Software de cross-corrélation statistique massif multi-catalogues  
(will be available at CDS)
  - ✓ Outils de recherche X/optique combinée d’amas de galaxies
  - ✓ Génération de SEDs par VOSed et distribution via le VO et services CDS.

Scientific Workshop Paris 30 novembre – 2 decembre 2015

« X-ray surveys with advanced multi-wavelength  
cross-correlation methods »

# Lessons Learnt

- Re-use as much as possible existing s/w (e.g. ftools, Swift XRT and XMM level 1->2 tasks for the MXT pipeline, VO tools for external data access, etc..)
- Build interactive analysis and pipelines using the same individual tasks.
- Distributed pipelines work !
- Important to have handy source identification tools (based on our XMM SSC+ARCHES experience)
  - Design VO based source identification tools
  - Make the tool as generic as possible (usable for ECLAIRS, MXT, VT, and in different modes QLA, Real time and pipeline analysis)
  - Provide identification probabilities whenever possible.