The Survey Science Centre report to the XMM-Newton Users Group

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astrophysique & planétologie

Topics

- SSC status
- SSC activities
- The 3XMM catalogue
- Development
- Future plans
- Summary

SSC status

- No major evolution in status since the 2015 Users Group meeting
- Regular teleconferences with the 9 SSC points of contact
- Consortium meeting held March 2016 in Santander, Spain
- Continued SAS task development + support
- Continued input into pipeline development via monthly SAS-CCB meetings
- Continued data products screening
- Ongoing source identification activities
- Enhancement of catalogue servers

SSC status

20 years of the SSC!

What we have achieved over the last 20 years

- Good quality software to reduce all XMM-Newton data
- Reliable pipeline to reduce XMM-Newton data automatically
- Provided the biggest catalogue of X-ray sources from a single observatory
- Provided a complimentary catalogue of ultra-violet and optical sources
- Provided repositories and databases in which to search and exploit the catalogue data and multi-wavelength follow-up data
- Produced a series of well cited papers

3XMM-DR6

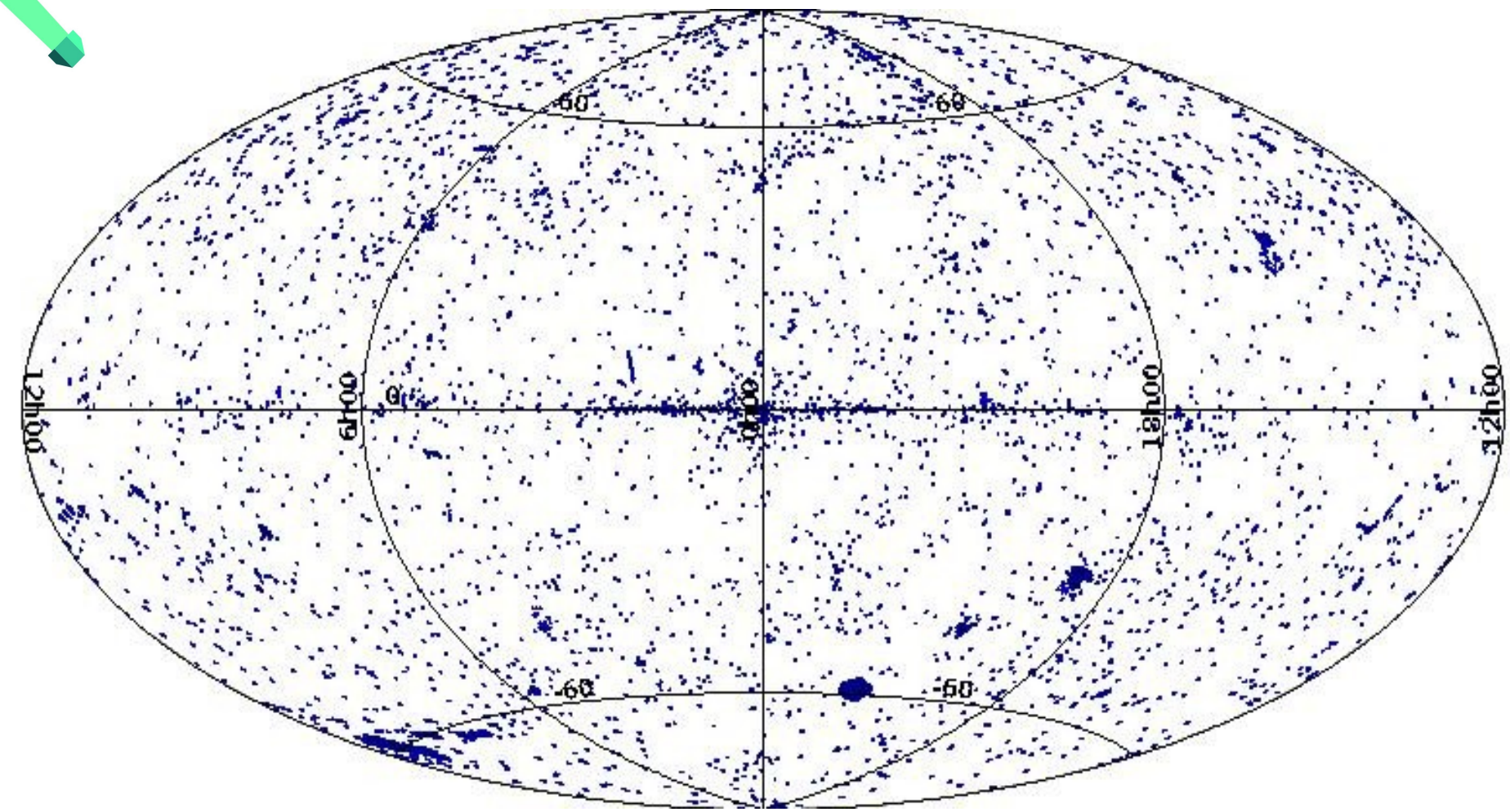
3XMM-DR6

Publication date expected : 5th July 2016

	3XMM-DR6	3XMM-DR5	Increment
Number of observations	9306	7781	1525
Number of 'clean' observations (i.e., observation class < 3)	5947	4735	1212
Observing interval	03-Feb-00 -- 04-Jun-15	03-Feb-00 -- 20-Dec-13	2.5 yr
Sky coverage, taking overlaps into account (≥ 1ksec exposure)	xx sq.deg	877 sq.deg	xx sq.deg
Number of detections	678680	565962	112718
Number of 'clean' detections (i.e., summary flag < 3)	552991	456904	96087
Number of unique sources	468440	396910	71530
Number of 'cleanest' (summary flag = 0, not in high-background fields) extended detections	11066	9082	1984
Number of detections with spectra	149968	133032	16936
Number of detections with timeseries	149968	133025	16943
Number of detections where probability of timeseries being constant is < 1×10^{-5}	5238	4668	570

3XMM-DR6

3XMM-DR6



3XMM catalogue paper

A&A 590, A1 (2016)
DOI: 10.1051/0004-6361/201526416
© ESO 2016

Astronomy & Astrophysics

30 citations !

The *XMM-Newton* serendipitous survey

VII. The third *XMM-Newton* serendipitous source catalogue*,**

S. R. Rosen[1], N. A. Webb[2,3], M. G. Watson[1], J. Ballet[4], D. Barret[2,3], V. Braito[1,6], F. J. Carrera[5], M. T. Ceballos[5], M. Coriat[2,3], R. Della Ceca[6], G. Denkinson[1], P. Esquej[1], S. A. Farrell[1], M. Freyberg[7], F. Grisé[8], P. Guillout[8], L. Heil[1], F. Koliopanos[2,3], D. Law-Green[1], G. Lamer[10], D. Lin[2,3,12], R. Martino[4], L. Michel[8], C. Motch[8], A. Nebot Gomez-Moran[8], C. G. Page[1], K. Page[1], M. Page[11], M.W. Pakull[8], J. Pye[1], A. Read[1], P. Rodriguez[9], M. Sakano[1], R. Saxton[9], A. Schwope[10], A. E. Scott[1], R. Sturm[7], I. Traulsen[10], V. Yershov[11], and I. Zolotukhin[2,3]

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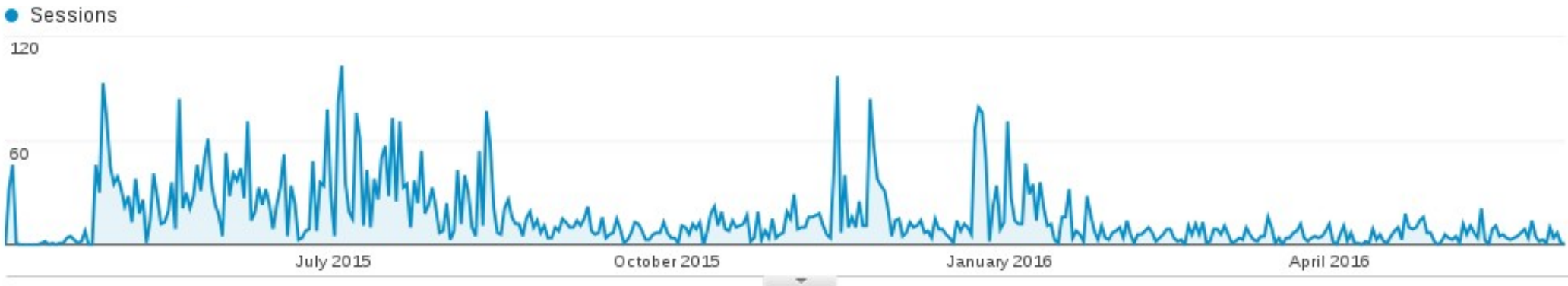
ABSTRACT

Context. Thanks to the large collecting area ($3 \times \sim 1500$ cm^2 at 1.5 keV) and wide field of view (30′ across in full field mode) of the X-ray cameras on board the European Space Agency X-ray observatory *XMM-Newton*, each individual pointing can result in the detection of up to several hundred X-ray sources, most of which are newly discovered objects. Since *XMM-Newton* has now been in orbit for more than 15 yr, hundreds of thousands of sources have been detected.

Aims. Recently, many improvements in the *XMM-Newton* data reduction algorithms have been made. These include enhanced source

Catalogue access

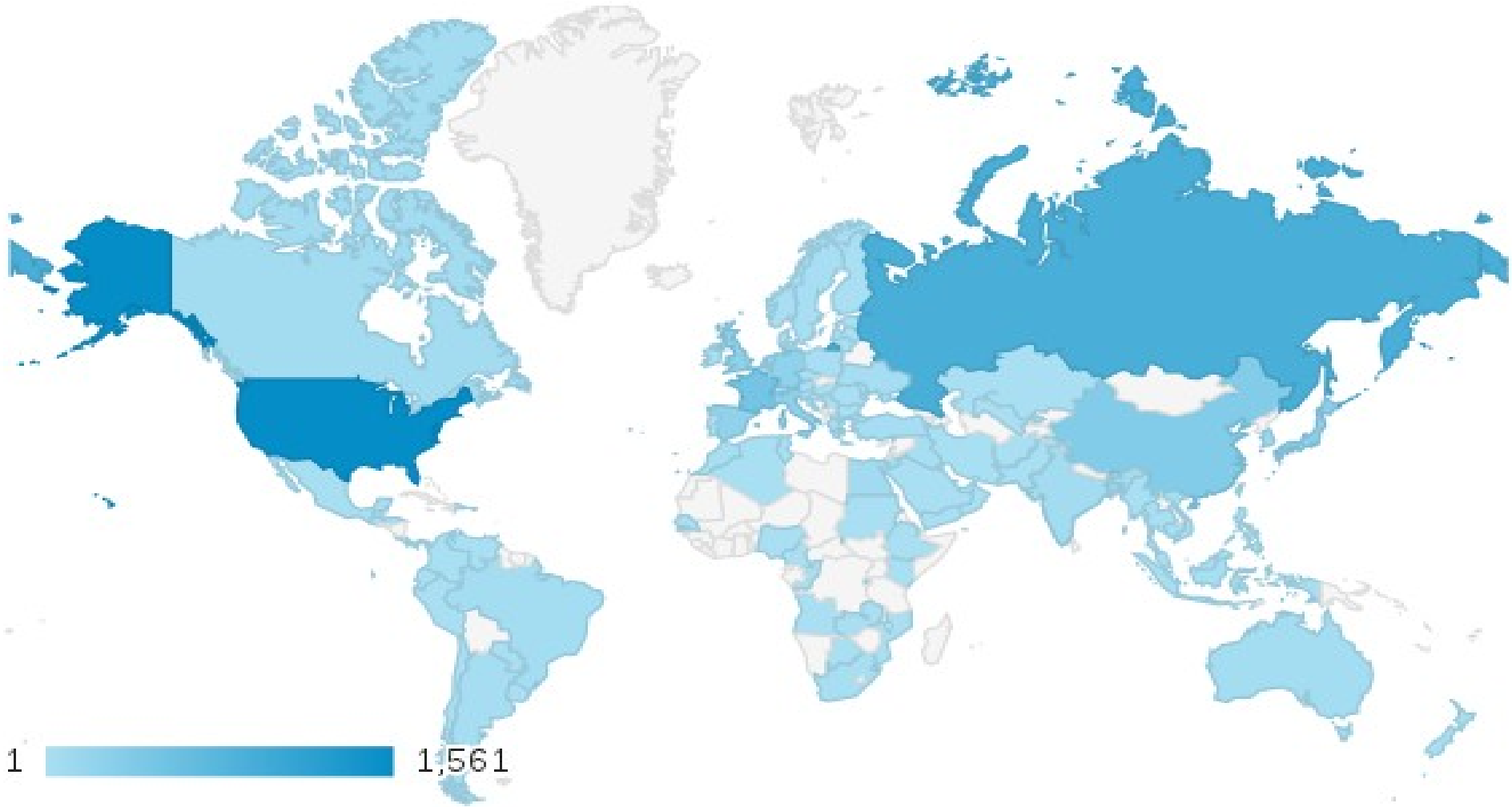


Sessions	Users	Pageviews
6,981	4,805	8,589
Pages / Session	**Avg. Session Duration**	**Bounce Rate**
1.23	00:01:19	82.90%
% New Sessions		
68.67%		

http://xmmssc.irap.omp.eu

Access from 108 countries worldwide

Catalogue access



Catalogue access

		6,989 % of Total: 100.00% (6,989)	70.30% Avg for View: 68.62% (2.44%)	4,913 % of Total: 102.44% (4,796)	82.86% Avg for View: 82.86% (0.00%)	1.23 Avg for View: 1.23 (0.00%)	00:01:19 Avg for View: 00:01:19 (0.00%)	Av 0.0
1.	United States	**1,561** (22.34%)	92.18%	1,439 (29.29%)	88.73%	1.09	00:00:28	
2.	(not set)	**953** (13.64%)	100.00%	953 (19.40%)	92.76%	1.07	00:00:20	
3.	Russia	**921** (13.18%)	8.69%	80 (1.63%)	73.40%	1.41	00:05:29	
4.	France	**513** (7.34%)	46.98%	241 (4.91%)	64.91%	1.61	00:01:25	
5.	China	**365** (5.22%)	75.89%	277 (5.64%)	86.85%	1.12	00:00:38	
6.	Japan	**298** (4.26%)	65.77%	196 (3.99%)	80.87%	1.29	00:01:10	
7.	United Kingdom	**276** (3.95%)	59.78%	165 (3.36%)	70.65%	1.47	00:01:20	
8.	Italy	**270** (3.86%)	52.22%	141 (2.87%)	77.78%	1.33	00:00:42	
9.	Germany	**253** (3.62%)	77.47%	196 (3.99%)	81.42%	1.27	00:00:40	
10.	Spain	**251** (3.59%)	50.20%	126 (2.56%)	76.10%	1.49	00:01:21	
11.	Netherlands	**166** (2.38%)	57.23%	95 (1.93%)	92.17%	1.10	00:00:30	
12.	South Korea	**141** (2.02%)	73.76%	104 (2.12%)	83.69%	1.11	00:00:50	
13.	Egypt	**73** (1.04%)	80.82%	59 (1.20%)	83.56%	1.15	00:01:15	
14.	India	**71** (1.02%)	95.77%	68 (1.38%)	92.96%	1.08	00:00:11	
15.	Canada	**70** (1.00%)	72.86%	51 (1.04%)	82.86%	1.19	00:00:59	

SSC catalogue servers

Almost 2000 users

xcatdb.unistra.fr/3xmmdr5/

3XMM-DR5 Interface - Observatory of Strasbourg

- DB content - Contact - 2xmmidr3 - 3xmmdr4 - b

Unique Sources | Individual Detections | Edit Query

XcatDB Content [Data access by clicking either on or on]

- Possible identifications of all EPIC sources in archival catalogs.
- 3XMM Slim catalog of unique sources with possible identifications i
- EPIC spectra, EPIC time series and other useful previews.
- Optical Finding Charts.

Additional Data and Features

- **XMMFITCAT spectral fits** (A.Corral et al.) can be accessed from the X-ray page). Only the simple models fitted on DR4 spectra are supported yet.
- **Online spectrum fitting** Select sources with spectra click on below any choose the model and submit. The back-end runs Xspec-python.
- **Search by region** (Individual detections only) Open the query editor on th Draw a Search Region, edit your region, accept and submit

The 3XMM-dr5 XMM-Newton catalogue

xmm-catalog.irap.omp.eu/source/202045402010003

XMM-NEWTON SURVEY SCIENCE CENTRE | eso 243-49 | SEARCH | Show query language

HOME | CATALOG | DIAGRAMS | WEB SERVICES | DOCS | LINKS | ABOUT

Search results > Source 202045402010003

3XMM J011028.2-460422

J2000 01 10 23.548 -46 01 38.03

sc_ep_1_flux	8.32252e-15 ± 3.1332e-16	sc_ep_2_flux	1.58134e-14 ± 4.31766e-16
mjd_first	53332.535162	sc_ep_3_flux	9.88641e-15 ± 3.53029e-16
mjd_last	56254.7151157	sc_ep_4_flux	8.62172e-15 ± 5.99312e-16
sc_chi2prob	0.039418887347	sc_ep_5_flux	1.27308e-14 ± 1.83782e-15
sc_ra	17.617656363	sc_ep_8_flux	7.9872e-14 ± 2.09926e-15
sc_dec	-46.0729608952	sc_ep_8_fmax	3.54705e-13 ± 7.76013e-15
sc_poserr	0.204063	sc_ep_8_fmin	2.22325e-14 ± 3.00177e-15
sc_det_ml	17087.3	sc_ep_9_flux	3.91494e-14 ± 8.30688e-16
sc_ext_ml	0.0	sc_extent	0.0

Arches project benefitted XCatDB

Under development

Source detection on stacked observations currently undergoing testing

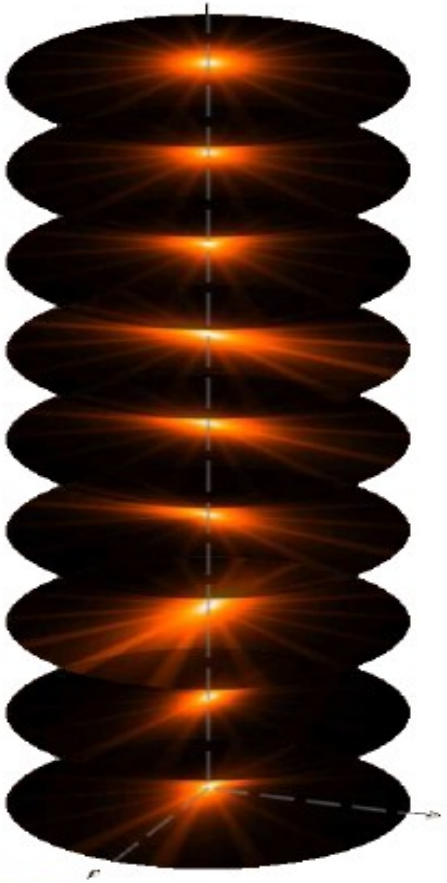
Aims:

- provide a standardised source-detection method for overlapping observations
- more convenient handling of multiple pointings for the user
- optimise stacked source parameters
- potential basis of a "stacked catalogue" of repeatedly observed sources

Under development

Source detection on stacked images: The testing phase

Stacking images with `emldetect`



Simultaneous PSF fitting:

- combine each image with the corresponding exposure map, background map, and detection mask
- fit all valid images per detection
- PSF chosen per image (position)
- fit parameters: position, extent, counts

I. Traulsen, AIP | Task design | 3

Under development

Catalogue from stacked source detection could be produced this year

Offshoot – improved background subtraction methods developed, based on adaptive smoothing

- significantly fewer spurious detections
- fainter sources can be detected

Future plans

To date the variable sky has not been significantly exploited with XMM-Newton

New tasks could be put into the pipeline to identify new variable sources in the field of view

With PIs prior accord, the coordinates of a new variable source could be made public (automatically)

Could help with following up gravitational wave detections
- but also find new tidal disruption events, etc

Summary

Continued SAS task development + support

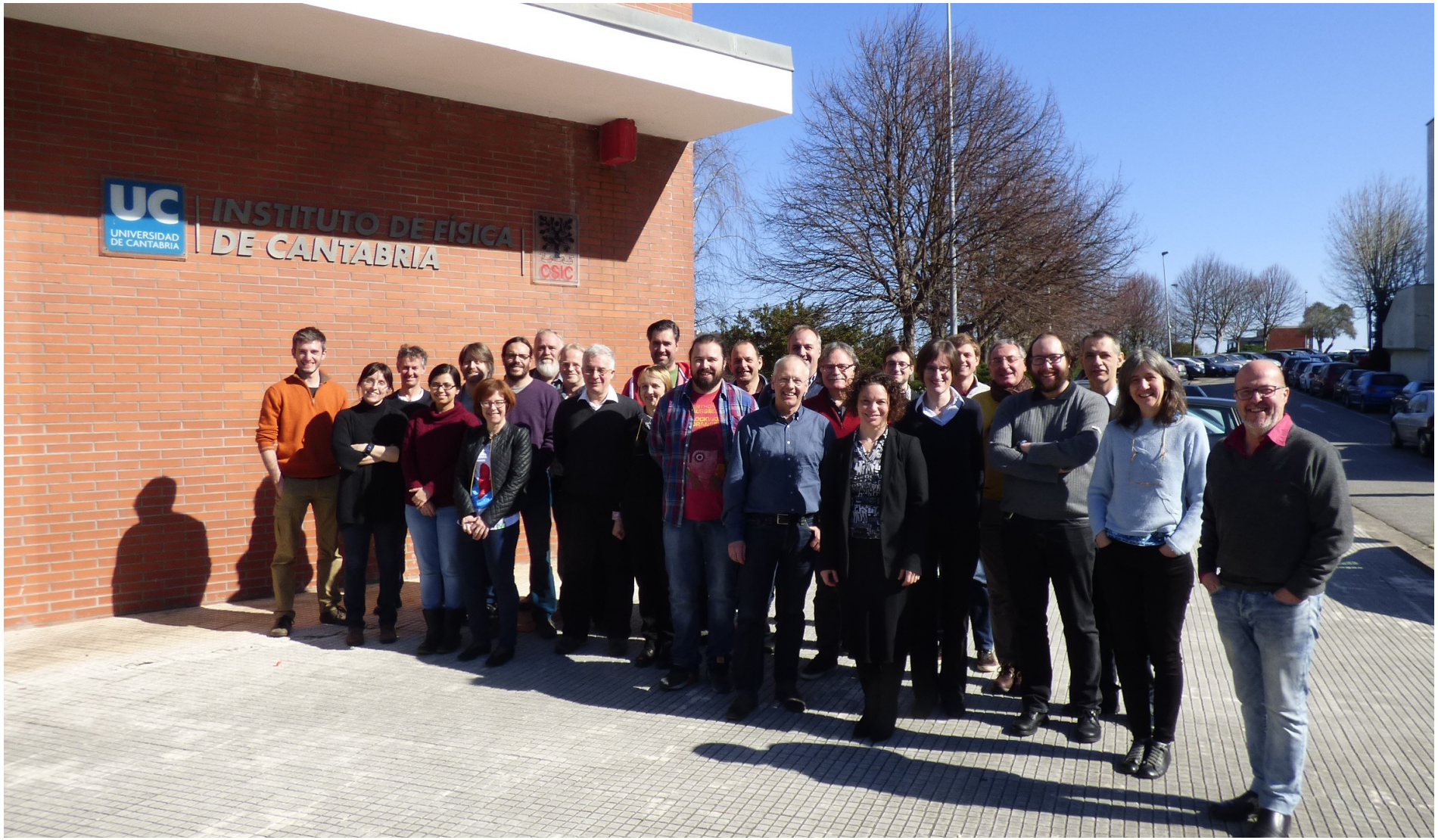
Continued data products screening

Ongoing source identification activities

3XMM-DR6 expected for next month, 3XMM-DR7 for next year

Stacked source catalogue expected this year

Enhanced catalogue servers helping to disseminate data products

4XMM, using new methods and upgraded products expected in 2019

Thanks to strong support from SSC members and the SOC, we are continuing to provide XMM-Newton legacy products to the astronomical community