



Newsletter of the INTEGRAL Science Operations Centre



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Foreword

Peter Kretschmar, Science Ops. Manager

This newsletter is concise, covering only a few important topics. Besides a summary of ISOC operations since the last newsletter, we outline the results of the *INTEGRAL* AO-6 call for proposal, and explain some important changes for future AOs.

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AO-7 and beyond – a new scheme

**Peter Kretschmar,
Science Ops. Manager**

At the Integral User Group (IUG) meeting held on June 11 and 12, 2008 at ESAC¹, the IUG adopted the Project Scientist's proposal to expand the open observing time in AO-7 almost entirely to large Key Programmes: 80% of the open time available shall be used for observations exceeding 1 Ms. Our Russian colleagues agreed to participate in these Key Programme (KP) observations.

As in previous AOs, associated (data rights) proposals can be submitted for targets in the field of view of the KP observations. In addition, this will also be possible for all open time observations, even shorter ones (<1 Ms), excluding TOOs. Data rights proposals can be submitted world-wide for non-Russian observations, but are restricted to scientists affiliated with Russian institutes and universities for Russian observations.

As a consequence of this new scheme, the way in which AOs are conducted will change for AO-7 and beyond. For AO-7 a first call for *all* proposals requesting observation time will be issued in

early 2009. This call will include Key Programmes (≥ 1 Ms), standard (<1 Ms) and TOO proposals. All of these will be evaluated by the TAC. Following the selection, a second call will be issued for data rights on targets within the selected non-TOO, open time observations. The second call will likely take place before the summer of 2009.

Tentative INTEGRAL AO-7 Timeline

Release of AO-7:	January 2009
Observing proposals selected:	March/April 2009
Call for data right proposals:	May 2009
Associated targets selected:	Summer 2009

AO-6 Summary and Statistics

**Marion Cadolle Bel,
Operations and Archive Scientist**

AO-6 Key Programmes

Given the success of the Key Programmes in previous AOs, the IUG recommended to increase the share of observing time for such programmes in AO-6 and subsequent observation cycles. Therefore the TAC recommended to continue the existing multi-year Key Programmes of AO-5 into AO-6, and to add three new programmes of 2000 ks each. The new programmes pertain to 1) the study of e^+e^- annihilation radiation in the Galaxy, 2) in the Small Magellanic Cloud and 3) giant magnetar flares in the Virgo Region.

The aims of the KP entitled "Confirming the Asymmetry of the Positron Annihilation Radiation from the Inner Galactic Disk" (P.I.: Weidenspointner), consists of observing two regions at $l = \pm 25$, $b = 0$, located symmetrically about the centre of the Galaxy, in order to determine the flux difference between them. It is hoped that this observation will uncover the mysterious origin of this emission, and thus of the positrons.

¹ The IUG minutes are available at <http://www.sciops.esa.int/index.php?project=INTEGRAL&page=IUG>

The KP called "Deep observations of 47 Tuc and the SMC" (P.I.: Maccarone), is intended to look for e^+e^- annihilation radiation and 26 Al in that region, and allow for a deep survey of accretion powered pulsars and low mass X-ray binaries in the Small Magellanic Cloud.

Finally, "Giant Flares from Magnetars in the Virgo Cluster" (P.I.: Stella), aims at the detection of 7–13 giant flares ($> 5 \times 10^{46}$ erg) in order to gain insight on the internal field of magnetars; such powerful energy release suggests that these fields are an order of magnitude higher than previously thought. This programme will yield much needed information on the total energy, recurrence rate and distribution of these extreme events.

Further details on the 6 accepted KPs can be found in the document [AO-6 Key Programmes](#).

AO-6 Proposals: Some Statistics

As for AO-5, the scientific community was strongly encouraged to submit KP-associated proposals (subscriptions) to gain the data rights on specific sources that will be observed for more than 100 ksec during the KP. The majority of subscriptions were accepted, and their distribution per KP and panel is as follows:

- Galactic Centre: 34 proposals were accepted: 22 (of 32 submitted) on compact objects, 3 (of 4) on extragalactic sources, 3 (of 3) on nucleosynthesis, and 6 in the Others category.
- North Ecliptic Pole: 9 proposals were submitted and all were accepted: 6 on extragalactic sources, 1 on nucleosynthesis, and 2 in Others.
- Cygnus Region: 16 proposals were accepted: 8 (of 13) on compact objects, 4 on extragalactic sources, and 1 on nucleosynthesis.
- Inner Galactic Disc: 24 proposals in total. 18 (of 26) on compact objects, 2 on extragalactic sources, 1 on nucleosynthesis, and 2 in Others.
- Small Magellanic Cloud: All 5 proposals were accepted: 2 on compact objects, 1 on an extragalactic source, and 2 in Others.
- Virgo Cluster: All 8 proposals were accepted: 5 on extragalactic sources, 1 on nucleosynthesis, 2 in Others.

For Normal Open Time and TOO proposals, the proportion of accepted proposals per panel was: 60% in the compact object category, 80% in Extragalactic, 33% in Nucleosynthesis and 100% in the Others categories. This distribution reflects both the allocated

observation time per general topic, and the interests of the *INTEGRAL* community, which clearly include regular observations of variable sources such as black holes and neutron stars, as well as long and deep observations of for the study of nucleosynthesis, active galactic nuclei, and other phenomena such as particle acceleration and interaction with molecular clouds.

Science Operations

**Celia Sanchez,
Operations Scientist**

Here is a summary of operations at ISOC since the last *Newsletter* of March 2008 up to mid-August 2008. We overview matters that relate to the instruments to the observations.

Instrument related issues

The telemetry allocated to SPI has been increased by 3 packets in response to its repeated saturation of caused by increasing background levels. These extra packets were not de-allocated from the other instruments—similarly affected by the background—but were instead obtained by over-subscribing the maximum telemetry rate by this amount.

In case the actual rate is exceeded for a short time, the packets are stored in an on-board buffer and safely down-linked later. After preliminary tests at the beginning of the year, this procedure was first manually implemented at MOC, and is now routinely applied by ISOC since June, 13th 2008 (revolution 692).

Calibration observations of the Crab were carried out on 24–29 March, during two whole revolutions (665 and 666). The motivation of this long Crab observation was to accurately calibrate SPI's high energy response.

OMC calibrations, necessary to characterise the flat field and dark current were done as usual every ~12 revolutions.

Observations during the last few months

The Galactic Centre (GC) region was visible by *INTEGRAL* starting in mid-March. Therefore, up to the end of April we mostly performed observations in this region, except for the two revolutions dedicated to the Crab calibration observation.

These included GC KP observations; Guest Observer (GO) observations such as the Galactic Bulge and GRS 1915+105 monitoring programmes, the

Galactic Disc scans and Mid Latitude 1 region; Core Programme (CP) observations of Galactic Plane Region 2; and a couple of TOOs: one on XTE J1810-189, and the other on 4U 0115+63.

The transient X-ray burster XTE J1810-189 was detected as active, and the triggered TOO allowed us to observe recurrent X-ray bursts every ~ 5 hours through the *INTEGRAL* monitoring of the source during revolutions 668-669.

The Be transient 4U 0115+63 underwent a major outburst in March-April 2008. The TOO involved the monitoring of the evolution of the cyclotron lines in the system, and thus the source was observed in revolutions 664, 667, 668, 669 and 670. This intensive observation campaign required an important remodelling of the Long Term Plan.

The month of May began with another TOO request on the well known, extragalactic source Mkn 421, that displayed a major burst during MAGIC and VERITAS observations. A multiwavelength campaign on this source was thus initiated, *INTEGRAL* was requested to join and it did, later followed by *Suzaku* and *XMM-Newton*. The implementation of this TOO was a major challenge for everyone involved.

Firstly, it was received on May 2: a public holiday both at ISOC and MOC. This required the people who were on-call to come to the office in order to implement the changes in the scheduled observations.

Secondly, the multiwavelength campaign was starting that very night, and this implied re-planning of the on-going revolution: a non-trivial task in itself, and on this occasion, proved to be substantially more difficult than usual.

Thirdly, in order to optimize the data quality from SPI, the observation had to be executed according to a particular sequence of pointings that had to be implemented on the fly. In addition to these initial hurdles, a few more technical difficulties related to file transfers from ISOC to MOC had to be overcome. Observations began one hour after the planning files reached MOC.

The rest of May, up to the end of the first week in June, was used to observe the Mid Latitude 2 field (GO), the Cygnus KP and the North Ecliptic Pole KP. The next 5 revolutions (690-694), were exclusively spent observing the Loop I and Loop IV circles in the local superbubble; the end of these observations coincided with the first day of summer on June 21.

The time up to mid-July was shared, in each revolution, between the XMM Large Scale Survey field and Galactic Plane region 3, because the latter target was constrained during the first portion of the revolution.

At the time of writing this, this is as far as we have gotten. We plan to spend the rest of July completing the 4 Ms of the Russian AO-4 Galactic Latitude Scans, the last one of which should be performed on July 24. Following this up to mid-August, the planned observations include almost exclusively the Perseus OB2 cloud (GO) and the Galactic Plane Region 3 (CP).

The Galactic Centre will soon be visible again, bringing us yet another visibility period to study and monitor the ever changing face of hundreds of galactic sources.

This *Newsletter* is based on inputs from members of ISOC, and edited by G. Bélanger.

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