

# ***INTEGRAL***

**Science Operations Centre**

## **Announcement of Opportunity for Observing Proposals (AO-7)**



### **AO-7 Schedule and Updates**

INT/OAG/08-0311/Dc

Issue 1.0

12 January 2009

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## 1 Purpose of this document

This document contains all matters of changing or time-sensitive procedures to be followed by observers preparing INTEGRAL proposals, and the policies followed by ESA in handling them. Therefore, all updates for the current AO relevant to observers are presented here.

This call for INTEGRAL proposals consists of all the relevant documentation, a proposal generation and submission tool, and other software to help assess the visibility of a target and estimate the observation time required to meet specific scientific goals.

Here is the list of the available supporting documents:

- “*The INTEGRAL Mission: Overview, Data Rights and Procedures*”
- “*AO-7 Schedule and Updates*” (this document)
- “*IBIS Observer’s Manual*”
- “*SPI Observer’s Manual*”
- “*JEM-X Observer’s Manual*”
- “*OMC Observer’s Manual*”
- “*INTEGRAL AO Tools Software User Manual*” (describes the use of PGT, OTE, TVP)

All these documents are available from ESA’s INTEGRAL Science Operations Centre (ISOC) web page: <http://integral.esac.esa.int/>, where observers can also find links to download the Proposal Generation Tools (PGT), and access the Observing Time Estimator (OTE) and the Target Visibility Predictor (TVP). Note that OTE and TVP run remotely over the web, whereas PGT needs to be installed locally.

## 2 Important changes to the AO scheme for AO-7 and beyond

A number of important changes will take effect in AO-7. Firstly, the Core Programme (CP) guaranteed time observations for the INTEGRAL mission have been completed. Therefore, a total of about 24 Ms per year will now be available for the General Programme open time science observations.

Secondly, there will be two calls for proposals: the first one (January 12, 2009) to select proposals to which the available observing time will be allocated (*observing time proposals*), and the second (May 25, 2009) to grant data rights on specific targets or emission features covered by any of the selected observing time proposals (*data rights proposals*). It will now be possible to subscribe to any non-TOO standard open time proposal in addition to the Key Programmes (KPs). More details are given below.

Thirdly, the duration of the AO-7 cycle of observations has been extended by 2.5 months to 14.5 months in total.

### 2.1 Observing time proposals

*Observing time proposals* will be submitted in response to this first call, and can be standard or Key Programme (KP) proposals.

A KP is defined as an open time observation of Normal type with an exposure of at least 1 Ms ( $10^6$  s) per year. Fixed Time and TOO observations cannot be KPs.

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Standard open time proposals can be of type Normal, Fixed Time or TOO, provided they request an exposure time of less than 1 Ms. Observation requests of 1 Ms or more can only be of Normal type and are considered as KP proposals.

## 2.2 Data rights proposals

*Data rights proposals*, to be submitted in response to the second call following the outcome of the first, are associated proposals. Extending the notion of subscriptions or associated proposals used in previous AOs with respect to KPs, it will now be possible to obtain data rights on point-like, extended sources or emission features contained in the field of view of **any** accepted *observing time proposal* except TOOs.

Although anyone can submit a data rights proposal to be associated to an accepted observing time proposal with non-Russian PI, only individuals affiliated with Russian institutes and universities can submit data rights proposals to be associated—for the usual one-year proprietary period—with accepted observing time proposals led by a Russian PI. Further details will be communicated in the second call.

## 3 Data rights updates for AO-7:

- The CP (guaranteed time) observations will be completed in 2009, prior to the start of the AO-7 cycle of observations. Hence, all references to the CP have been removed.
- The end of the CP results in a simplified decision-flow for TOO observations.
- Rights for multiple sources in the field of view have been updated to homogenize the handling of amalgamations and data right proposals (see Section 7).

## 4 Scientific observing time available in AO-7

There is approximately 24 Ms of INTEGRAL scientific observing time in a year. This means that in AO-7 (14.5 months duration), there will be about 29 Ms of scientific observing time, which will be used as shown below. Note, that the exposure times given are indications only (see also Table 1).

- 1) Following a recommendation made by the INTEGRAL Users Group in June 2008, the total scientific observing time for all Key Programme observations (each exceeding 1 Ms) will be further expanded to 19.3 Ms in AO-7.
- 2) About 4.9 Ms are available for standard, non-TOO proposals of < 1 Ms. Note that the (sub-) total of items (1) and (2) is 24.2 Ms, out of which 80% will be reserved for KP observations.
- 3) About 2.6 Ms are set aside for the execution of TOO observations. Note that this is an allocation required by ISOC for long-term planning. If justified by the expected scientific results, however, more time can be allocated to a TOO observation.
- 4) An amount of 2.2 Ms will be reserved for the Russian scientific community as compensation for the under-return of Russian open time observations accumulated during previous AO cycles. This compensation is in addition to the guaranteed return of open time observations for the Russian science community (see Section 5) for this AO. This



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guaranteed return is included in the time allocation for items (1) to (3) above. Both the guaranteed return (7.25 Ms), and the additional compensatory time (2.2 Ms) will be awarded to successful proposals only.

- 5) Experience from previous AOs has shown that there is usually a carry over of about 2 Ms needed to finish observations that have not been completed in the previous AO for various reasons like sudden changes to the planning due to TOOs, which often lead to subsequent visibility constraints on the previously planned observations. However, given that AO-6 has been extended by 2 months, it can be expected that the entire carry over from AO-5 into AO-6 will have been scheduled during AO-6. We therefore assume no carry over from AO-6 into AO-7 in our estimate.

As a result, the entire 29 Ms of scientific observing time in AO-7 will be available for new observing proposals. The breakdown is summarised in Table 1, and Figure 1 shows the schematic timeline. Exposure times are approximate.

## 5 The AO-7 observation cycle

The AO-7 cycle of observation will last 14.5 months, from 16 October 2009 until the end of December 2010. The scientific observing time available for the AO-7 cycle of observations will be entirely used for open time observations of the so-called *General Programme* (GP).

The GP is open to the world-wide scientific community to apply for observing time by responding to the call for proposals (Announcement of Opportunity or AO). Key programme observations are part of the GP.

An amount of 25% of the GP open time will be reserved for scientists from the Russian Federation in return for their providing of the PROTON launcher, which put INTEGRAL in orbit on 17 October 2002. This guaranteed return amounts to 7.25 Ms for this AO.

The schedule for AO-7 is as follows:

- **12 January 2009: release of INTEGRAL AO-7: call for observing time proposals**
- **20 February 2009, 14.00 CET (13.00 GMT): deadline for observing time proposals**
- **March 2009: Time Allocation Committee meeting**
  
- **25 May 2009: release of INTEGRAL AO-7: call for data rights proposals**
- **3 July 2009, 14.00 CET (13.00 GMT): deadline for data rights proposals**
- **September 2009: Time Allocation Committee meeting**
- **16 October 2009: Start of AO-7 observation cycle**

INTEGRAL AOs are primarily intended for scientists of the ESA Member States and countries participating in INTEGRAL (Russia, USA, Czech Republic and Poland), but proposals from other countries will also be considered by the Time Allocation Committee.

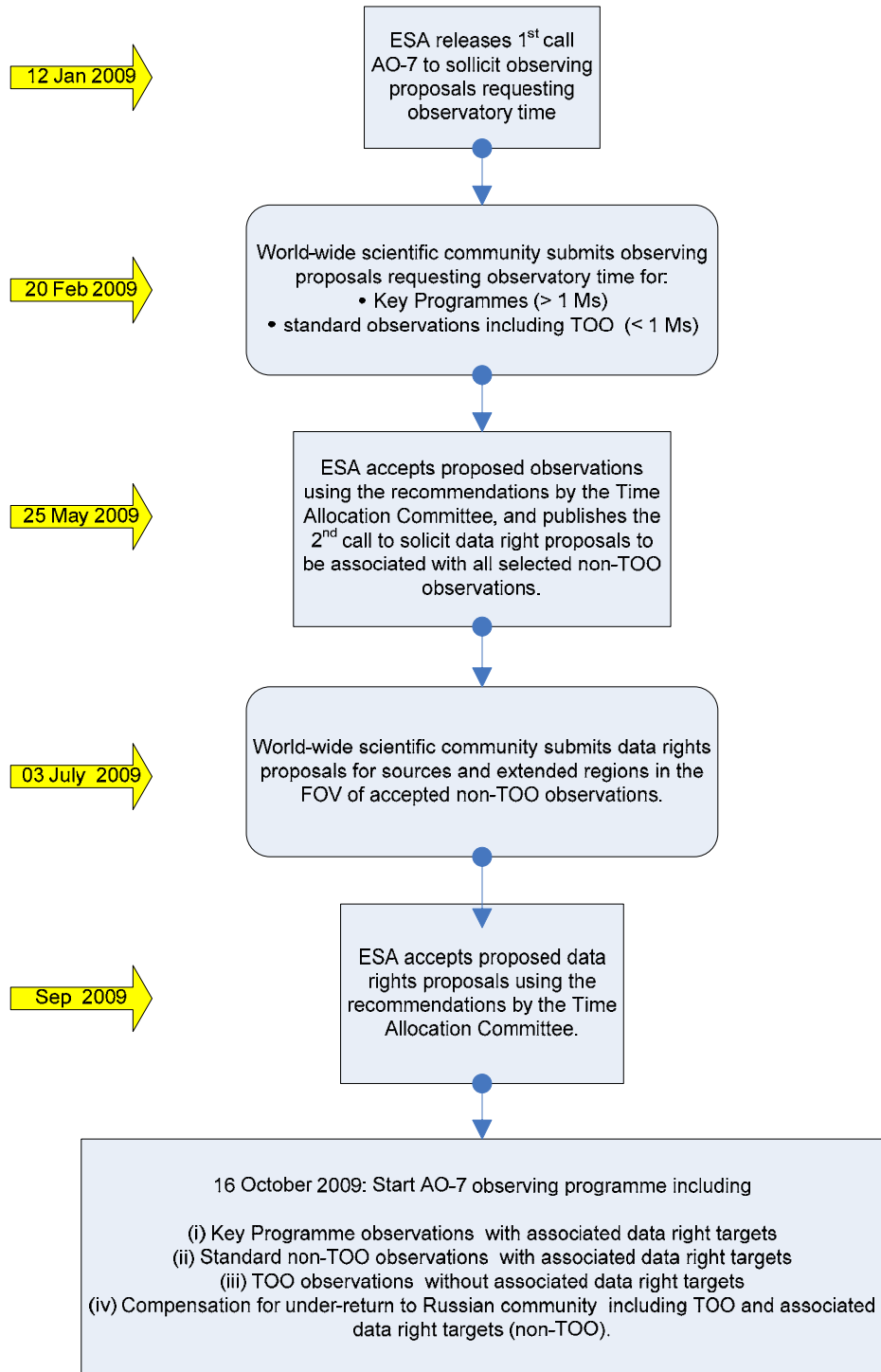
Scientists from institutions in the United States are welcome to respond to this AO either as Principal Investigators or as co-Investigators on non-US proposals. Accepted US investigators should request funding from NASA via a separate solicitation.

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Table 1: High-level breakdown of observing time allocation in AO-7.

Exposure time [ $10^6$ s]	Notes
19.3	Available for all Key Programme observations with exposure > 1 Ms. Proposals from world-wide science community.
4.9	Available for all standard, non-TOO, observations with exposure < 1 Ms. Proposals from world-wide science community.
<u>Subtotal: 24.2</u>	<p>Total available for new open time (non-TOO) observations, with a share of 80% / 20% for KP and standard (non-TOO) observations, respectively. This includes the guaranteed return to the Russian scientific community (25% of 29 Ms, or 7.25 Ms) with – in itself - a comparable share of observing time between Key Programmes (80%) and standard observations (20%).</p> <p>All accepted observing proposals will be open for associated “data right proposals” to be solicited in the 2<sup>nd</sup> call of this AO. See text for details.</p>
2.6	Set aside for execution of TOO observations. Proposals to be submitted in response to the 1 <sup>st</sup> call of AO-7. “Data right” targets proposed for during the 2 <sup>nd</sup> call of this AO-7 <u>cannot</u> be associated with these TOO observations.
2.2	Compensation for under-return to the Russian scientific community. Proposals from the Russian scientific community only are to be included in response to the 1 <sup>st</sup> AO call. TOO observing proposals in the 1 <sup>st</sup> call, and data right proposals for non-TOO observations in the 2 <sup>nd</sup> call are possible. See text for details.
0	Earmarked for carry-over (completion) of AO-6 observations.
<b>Total: 29.0</b>	Total time available for new science observations in AO-7, duration 14.5 months





*Figure 1: Schematic Timeline*

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## 6 Extended mission and future AOs

The nominal operational mission began on December 16, 2002, two months after the launch, and lasted 24 months. Therefore, the nominal mission ended on December 16, 2004. The extended mission is currently approved by the Science Programme Committee (SPC) until December 31, 2012, and will be subject to a further scientific review in the Fall of 2010. AO cycles are planned to continue to run on a yearly basis.

## 7 Notes on amalgamation

In order to encompass the older notion of a KP associated proposal with the newer one of a data rights proposal, which is essentially the same, we have made the definition of amalgamation somewhat more general. We now make the distinction between *physical* and *logical* amalgamation:

- i. *Physical* amalgamation is the process by which two or more non-TOO observations are combined by ISOC after the TAC peer review process into a single observation using an optimised pointing axis, pattern and exposure time.
- ii. *Logical* amalgamation refers to the sharing of data from a single observation among several PIs who have been assigned data rights on specific sources contained in the same FOV (e.g. Galactic Centre KP).

The former has been used since the start of the mission and thus needs no further explanation. The latter is simply the use of the same data set by more than one PI studying different sources contained in the same FOV. Hence, all PIs receive all the data for the observations, but work only on those sources for which they have been granted data rights.

It is expected and understood as good scientific practice that the scientists (who will have gained knowledge on the other sources in the course of their analysis) will not attempt to publish data pertaining to other proprietary sources or targets during the proprietary period. Any non-observance of this rule will be pointed out by the Project Scientist to the publisher and the TAC, that will take this into account for subsequent rounds of AO. Please refer to the chapter on data rights in “*The INTEGRAL Mission: Overview, Data Rights and Procedures*” for more details.

## 8 Availability of scientific data in near real time

Following up a discussion of the INTEGRAL Users Group, the ISDC and ISOC will be ready to routinely provide data in near real time (NRT) to the observer.

The procedure, to be implemented with AO-7, will be as follows:

- PIs for accepted observing proposals, and PIs for associated data right proposals will receive e-mails soon after the TAC approval and shortly before the start of their observation describing in detail how they could get access to their NRT data.
- NRT data will be made available on an ftp area in the same form as available in the archive. Data will be protected by a special key communicated in the e-mails above. NRT data availability will be about 3.5 hours after data have been taken on board.
- NRT data will be deleted when consolidated data have been distributed.