



# Newsletter of the INTEGRAL Science Operations Centre



No. 1

November 2000

## Foreword

*Christoph Winkler - Project Scientist*

This is the first issue of the ISOC Newsletter published by ESA's INTEGRAL Science Operations Centre (ISOC). The purpose of this Newsletter and future issues is to provide timely information to the scientific community about the status of the INTEGRAL mission, spacecraft, instruments, status of observing proposals and observing programme (planned, scheduled and executed) and various INTEGRAL highlights. The main topic of this issue is the release of the AO-1 Call for Observing Proposals. Please also consult the internet at <http://astro.estec.esa.nl/Integral/isoc>.

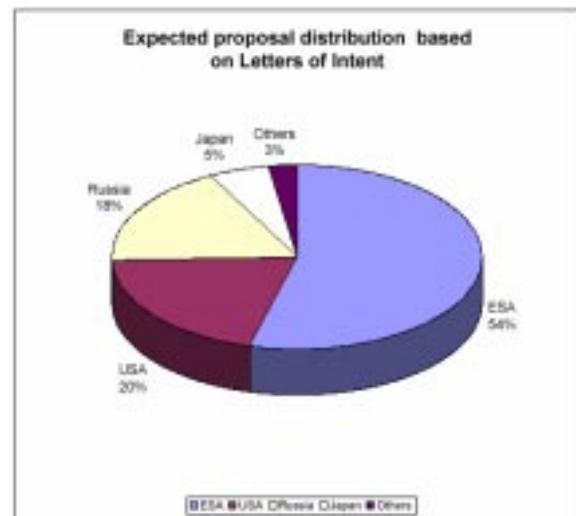
INTEGRAL, ESA's 15 keV to 10 MeV gamma-ray observatory mission, shown below as structural model in ESTEC (Summer 1998), will terminate its hardware procurement activities in the forthcoming months. Following a payload status review on 04 October 2000, ESA formally confirmed the launch date of 22 April 2002. Preparations for Science Operations are in full swing.



## Results of Letters of Intent

*Norman Trams - Resident Astronomer*

The first part of the AO-1 Call for Observing Proposals is behind us: the Call for Letters of Intent. The number of Letters of Intent was encouragingly large. In total we received 242 Letters of Intent from 20 different countries, announcing a total of about 700 proposals. The majority of the announced proposals originate from ESA member states (380). Of the non-member states, the USA and Russia share the majority (with 142 and 124 proposals respectively). Below we show a pie chart with the split per country of the expected proposals. The split between the Time Allocation Committee's panels shows that most proposals are for compact objects (about 250), immediately followed by extra-galactic objects (190). The numbers of proposals for the nucleosynthesis and miscellaneous panels are clearly smaller (117 and 107 respectively). For about 36 proposals no specification of the topic was given.



## AO-1 for Observing Proposals

*Norman Trams - Resident Astronomer*

After the successful Call for Letters of Intent the ISOC has now released the second part of the AO-1 Call for Observing Proposals, the AO itself. The AO was released on November 1, 2000, with a deadline for the receipt by ISOC of proposals by February 16, 2001, 15:00 CET (14:00 GMT).

The AO has been issued electronically only, and consists of a number of documents (policies document, spacecraft manual, instrument manuals, guaranteed time document and some annexes), which are available in PDF format from the world wide web at:

<http://astro.estec.esa.nl/Integral/isoc>

In addition to documents, a software package (the Proposal Generation Tools or PGT) is available for download; it must be used by the proposer to prepare and submit a proposal. The proposal submission is electronic only. In order to submit a proposal, a Proposer ID is needed. In order to avoid delay close to the proposal deadline, observers are recommended to request a Proposer ID as early as possible by sending an E-mail requesting a Proposer ID to the INTEGRAL helpdesk<sup>1</sup>. This helpdesk will also be available after 1 November 2000 to answer all questions on INTEGRAL you may have.

## Spacecraft Status

*Raffaello Carli - Payload Systems Engineer*

As one of the last integration activities on the FM spacecraft, the installation of thermal hardware (heaters and multi-layer isolation blankets) has been completed. The remaining activities are now the installation of the thruster and the testing of the Reaction Control Subsystem. As far as the payload module is concerned all activities to be done before instrument integration are on schedule for accepting the first FM instrument. The optical camera (OMC) will be integrated by the end of October. The EMC tests with the spacecraft in launch configuration have been performed suc-

1. [inthehelp@astro.estec.esa.nl](mailto:inthehelp@astro.estec.esa.nl)

cessfully. Other ongoing activities are the upgrade and testing of the command and data management unit and the software for the attitude and orbit control system (AOCS). These upgrades were introduced after evaluation of events during the initial phase of the XMM mission. Payload-dedicated tests followed by a system functional and ground segment system verification tests are under preparation.

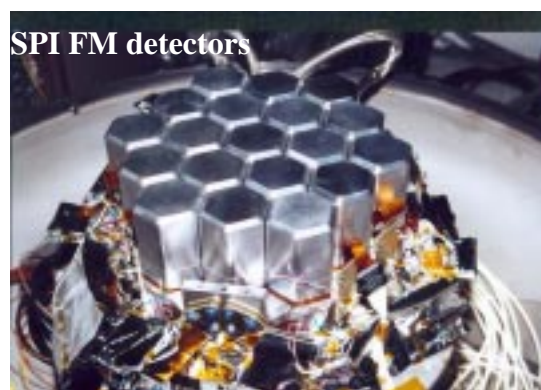
## Payload Overview and Status

The INTEGRAL payload consists of two coded aperture mask gamma-ray instruments: the spectrometer **SPI** (20 keV - 8 MeV) utilizing Ge detectors cooled to 85 K providing an energy resolution of 2 keV @ 1 MeV, and the imager **IBIS** (15 keV - 10 MeV) utilizing two pixellated detector arrays (CdTe, CsI) providing 12' angular resolution. Two monitors, in X-rays (**JEM-X**, 3 - 35 keV) and optical wavelengths (**OMC**, V- band) provide the important extensions to lower energies. All 4 instruments are co-aligned and will be operated simultaneously.

## Spectrometer SPI

*Norman Trams - Resident Astronomer*

The integration and testing of the SPI flight model (FM) subsystems is ongoing. The 19 Ge detector chains have been integrated and tested.



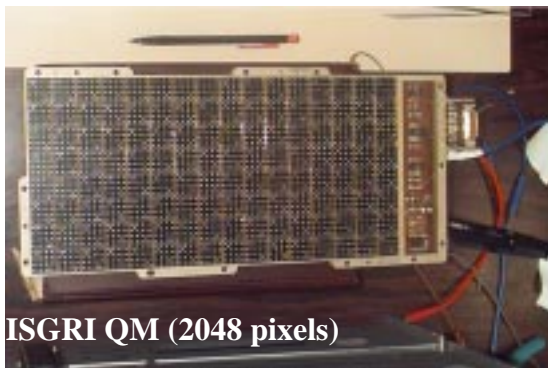
The energy resolution shown by the detectors in the laboratory tests was 2.2 to 2.5 keV at 1.3 MeV (slightly better than specified). A decision was made to operate the detectors in vac-

uum instead of encapsulating them in aluminum and filling the volume with nitrogen. The delivery of the flight model to ESA is scheduled for April 19, 2001, after an extensive calibration campaign at instrument level in France in March 2001.

### **Imager IBIS**

*Paul Barr - Resident Astronomer*

The IBIS Qualification Model (QM) is currently being calibrated at Laben/Turin. The flight model (FM) is under construction. The ISGRI QM (2048 pixels, 1/8 of total detection area) is shown below.



Delivery of the FM to ESA for integration with the spacecraft is foreseen to be in several stages, with the PICsIT detector expected in January 2001 and the ISGRI FM in April 2001.

### **X-ray Monitor JEM-X**

*Astrid Orr - Operations Scientist*

Tests of the JEM-X qualification model (QM) show good energy and position resolution, using the low-gas-pressure, low-gas-gain design baseline. The micro-strips of the detector were also seen to be very well aligned with the collimator.



It has become apparent, however, that additional mechanical support should be added to the micro-strip plate. This was implemented during October 2000. The full flight software will be completed by December 2000. Because of this, the delivery of the engineering model (EM) may have to be postponed until after October 2000. The first flight model (FM1) of JEM-X will be delivered to ESA at the end of February 2001. The second flight model (FM2) is scheduled to be delivered to ESA by the end of March 2001.

### **Optical Monitor OMC**

*Astrid Orr - Operations Scientist*

The qualification model (QM) tests were performed between January and May 2000 and their preliminary results presented at the 18th Integral Science Working Team meeting (October). The qualification review was successfully completed at the end of September 2000.



The flight model (FM) hardware has been integrated and fully tested, both at INTA, Madrid and, for the thermal vacuum and balance tests, at CSL, Liège. There are no significant differences between the QM and the FM test results. The OMC FM was delivered to ESA on 10 October 2000: the first PI instrument from Spain for the ESA science programme! The actual shipment to Alenia Spazio was scheduled for the end of October, followed by the integration of the OMC on to the spacecraft.

The on-board software for the OMC is now completed and validated.

## INTEGRAL Science Data Centre

*Julian Sternberg - Software System Engineer*

The ISDC will provide an INTEGRAL data analysis and distribution service to the community, as summarized in the documentation released for AO-1. Intensive software development and testing has been in progress, with much of the general software approaching completeness. The instrument teams are contributing software which is “closer” to the instruments, however this has proved more time-consuming than expected. A complete version, integrated at ISDC, is now expected by mid-2001 for the key data analysis subsystems. Detailed planning for ISDC’s operations (as well as ISOC’s) is about to gather speed. A summary of ISDC’s status will also be reported via future issues of this newsletter. In addition, ISDC’s own web-based newsletter provides informal and more detailed articles on subjects of particular interest (<http://isdc.unige.ch/>).

## 4th INTEGRAL Workshop

*Christoph Winkler - Project Scientist*

Over 230 scientists from all over the world met in Alicante/Spain from 4 to 8 September to present about 250 papers (oral talks and posters) during the 4th INTEGRAL workshop “Exploring the gamma-ray universe”. The purpose was to review and discuss the latest progress in INTEGRAL science topics and to present expected performances of INTEGRAL, simulations, data analysis tools and observing programmes. Papers, which are currently being reviewed by the INTEGRAL Science Working Team, will be published as an ESA SP-proceeding in Spring 2001<sup>1</sup>.

1. [http://astro.estec.esa.nl/Integral/integ\\_workshop4.html](http://astro.estec.esa.nl/Integral/integ_workshop4.html)

## Any Other Business



*Arrival of the 1:10 scale INTEGRAL model and additional PR material (brown box: 95 kg, blue box: 166 kg) at a distance of ~ 500 m from the location of the 4th INTEGRAL workshop in Alicante/Spain on 6 September 2000 (T ~ +30° C, 90% rel. humidity). Where is the transport equipment?*

## How to reach the ISOC ?

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<http://astro.estec.esa.nl/Integral/isoc>  
E-mail: *name*@astro.estec.esa.nl  
(*name* = first initial and surname, max 8 characters)

**Table 1: Key ISOC personnel<sup>a</sup>**

Name	Function	Phone
Winkler, C.	Project Scientist	3591
Hansson, L.	Science Ground Segment Manager	3471
Barr, P.	Resident Astronomer	5139
Trams, N.	Resident Astronomer	3476
Orr, A.	Operations Scientist	3943
Sternberg, J.	System Engineer	4001
Breneol, C.	System Engineer	4937
Nolan, J.	Operations Engineer	3401
- vacant -	Secretary	5818

a. The complete list of ISOC staff is available on the ISOC WWW