Call for Declarations of Interest in Science Instrumentation for the International X-ray Observatory Mission (IXO) Cosmic Vision L-class mission candidate

1 Introduction

ESA is currently carrying out an assessment study for the International X-ray Observatory Mission (IXO). IXO is a joint NASA-ESA-JAXA mission candidate and is one of the candidates for the "L1" launch slot in the Cosmic Vision plan, with a foreseen launch in 2020. All three currently studied L-class mission concepts (EJSM/JGO, IXO and LISA) will undergo parallel studies with a selection at the end of 2010, when two mission concepts will be selected for definition studies, extending to the end of 2012. Eventually, the first L-class mission will be adopted for flight with an industrial implementation being planned to start in 2013.

The IXO instruments are foreseen to be funded through the national agencies and provided by consortia of institutes led by Principal Investigators (PIs). To enable the instruments being defined at the same level as the other mission elements (platform, launch services, etc.), assessment-level studies for the instrumentation will have to be carried out by Instrument Study Teams, in line with the general approach to science payload studies and development, described in the attached document of the Science Programme Committee [SPC(2008)3].

With the present call for Declaration of Interest, ESA invites Instrument Study Teams to propose the constitution of nationally funded consortia to carry out assessment-level studies of scientific instruments relevant to IXO. However, this call is neither binding, nor a strictly required pre-requisite for the space agencies with respect to the final selection of the payload.

The results of the present Call for Declarations of Interest will not be binding for ESA, NASA or JAXA with respect to any future AO, which will be fully open and competitive. This call is coordinated by ESA for the national agencies of ESA member states in order to promote, within ESA member states, an appropriate Technology Readiness Level (TRL) in preparation for the issue of the AO for the selection of potential IXO Payload instruments.

2 Scope of the studies

The instrument assessment studies selected under this call will have to be conducted in parallel with the ESA system studies. Any instrument or instrument subsystem that is identified in the draft IXO Payload Definition Document (attached to this call), may be proposed for study. Study activities may also be proposed for instruments so far not formally identified in the IXO model payload, if appropriate scientific or technical justification is given. The relevance of such instruments for the mission will be evaluated by ESA.

The general objectives of the proposed instrument study activity are:

1- Achieve a level of technical definition of the science instruments consistent with the level of the other elements of the mission concept,

2- Enable a sound development risk assessment – including Technology Readiness Level (TRL) evaluation – as input to the mission down-selection at the end of the Assessment Phase (currently planned at the end of 2010),

3- Establish a Rough Order of Magnitude (ROM) cost evaluation of the instrument,

4- Provide a preliminary assessment of the Member State interest in science instrumentation for IXO,

5- Identify critical elements, key interfaces and resources needed from the spacecraft in support of the proposed instrument or instrument subsystem,

6- Identify preliminary technology development activities (TDAs) as needed for the proposed instrument or instrument subsystem.

To achieve the above goals, the studies will have to address in particular the following points in order of priority:

- Technical definition of the item proposed for study,

- Definition of technology development activities and pre-developments if any, to be implemented before the Mission Implementation Phase,

- Spacecraft interface and resource requirements,

- Development plan, including model philosophy, validation and verification approach, procurement scheme and schedule,

- Technology readiness analysis,

- Schedule risk analysis and identification of critical paths,

The instrument studies should be focused on critical or new elements of the respective instrument. They should mainly consist of engineering analysis, including numerical models, if and when required. However, hardware tests may also be proposed as part of the activities, but should be limited to addressing the feasibility or testing critical elements of the proposed instruments. Technology developments should be specified separately, as they will be collected in a Technology Development Plan, which will be approved separately.

3 Consortium structure and selection procedure

Any scientist affiliated with a scientific institution within an ESA member state may respond to the present call. The proposing team may include scientific institutions from outside ESA member states, but the leading institute (Instrument Study Lead institute) should be based in one of the ESA member states. Participation in the studies by scientific institutions outside ESA member states should, if proposed, keep in mind the prospective provision and funding scheme for the instruments.

A proposing team may include industrial companies in ESA member states as partners. ESA reserves the right to review the proposed industrial participation to ensure efficient coordination and interfaces with the ESA-funded industrial assessment study.

Prior to the selection of the responses, ESA reserves the right to verify the financial viability of the proposed activities with the funding agencies. All study activities, including instrument related technical development activities, which are carried out in response to the present call will be on a non-exchange of funds basis between ESA and the respondent's institutions and funding agencies.

The national funding agencies will finally decide which of the proposed studies to fund and at what level. ESA is assisting and advising the national funding agencies through the organization of this call.

4 Proposal content and submission process

The study proposal shall have a maximum length of 20 A4-pages with a minimum font size of 10 points, and shall address the following issues:

- Definition of the science payload item proposed for study
- Rationale for proposing the study
- Scope of the study
- Study logic
- Study team organisation.
- Expected study outputs: reports, models, etc
- Proposed funding scheme of the study through Member States
- Preliminary list of technology developments

Proposals must be submitted in electronic form by 9 June 2009 16:00 CET to ESA through the interface at the address http://sci.esa.int/ixo_doi, and must be in the form of PDF documents.

While no formal endorsement from the national funding agencies is required at the stage of proposal submission, a copy of the proposals must be sent to each of the relevant funding agencies.

5 Interface with the ESA-managed system study

To maximize the study output, proper interfaces will be defined between the proposed study and the ESA-managed and funded study activities for the mission in question. Proposers should assume a starting date of 1 August 2009 for their study activities, and a duration limited to 12 months, with an ending date of 31 July, 2010.

Details of the schedules will be agreed between ESA and the proposing teams to ensure proper synchronization with the ESA-managed industrial activities.

The proposals should clearly identify the scientific Instrument Study Lead and the Instrument Study Manager. The latter will be the single interface to ESA for all technical and schedule issues.

To ensure confidentiality of the ESA-managed industrial activities, communication and information between the selected consortia and industries working under ESA contract will only take place through ESA personnel.

6 Documentation

The Call for Declaration of Interest in Science Instrumentation includes the following documents:

- The present Call,
- Document SPC(2008)3, “National Activities Parallel to The Cosmic Vision Studies”
- The draft Payload Definition Document (PDDv6) for the mission
- The Science Requirements Document for the mission

More information about IXO can be found at http://sci.esa.int/ixo, and links therein.

7 Further information

For technical questions please contact the IXO Study Payload Manager
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For any other questions please contact the Coordinator for Astrophysics and Fundamental Physics missions
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