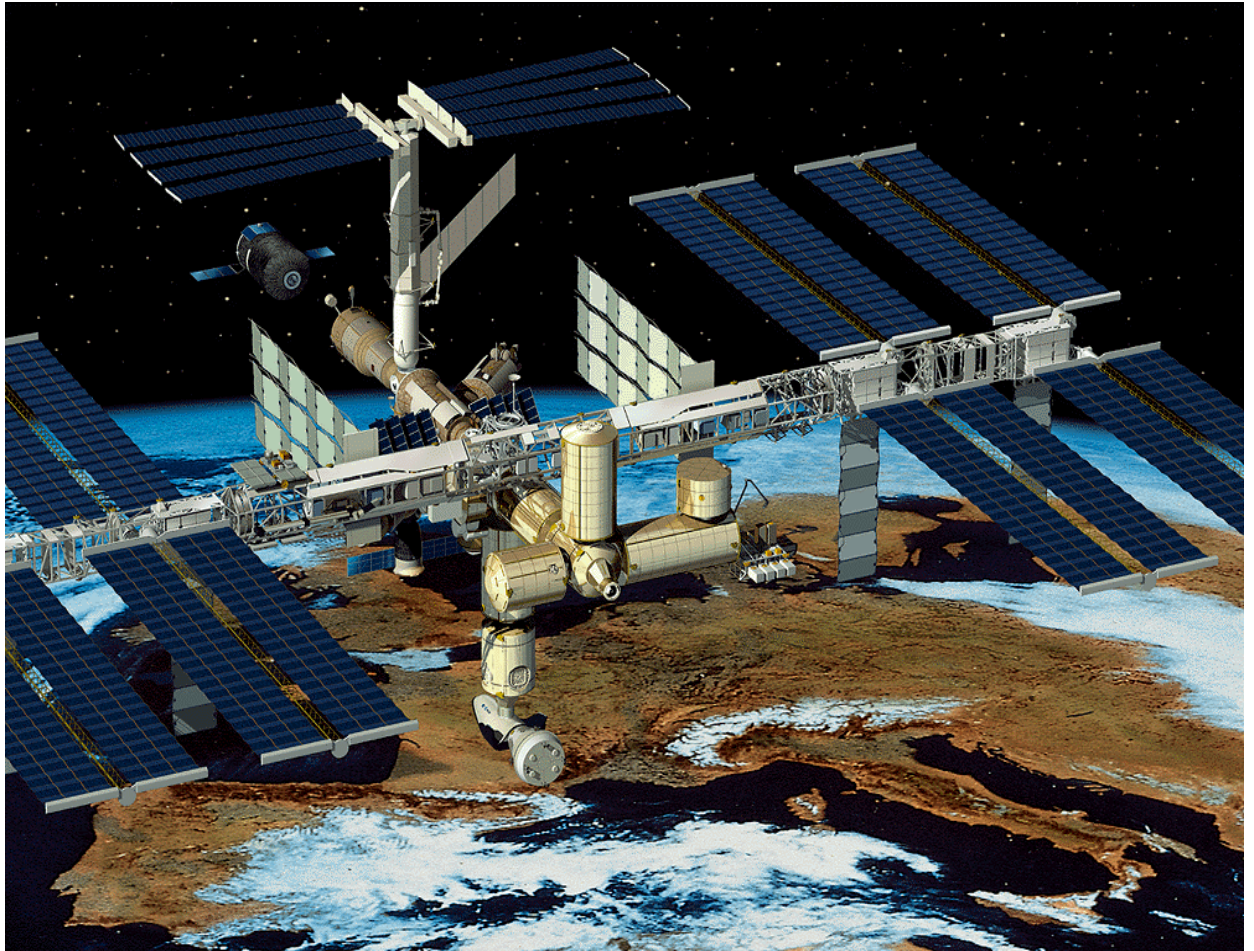


**International Research Announcement for
Research in Space Life Sciences at the
International Space Station – ILSRA-2004
ESA Specific Announcement**



Notices of Intent due:

2nd March 2004

* * * * *

Proposal due:

5th May 2004

Contents

- 1 [Description of the Announcement](#)
 - 1.1 [Introduction](#)
 - 1.2 [Announcement Objectives](#)
 - 1.3 [Facilities available for Life Science](#)
 - 1.4 [Biological Experiments](#)
 - 1.5 [Effects of Radiation](#)
 - 1.6 [Physiological Experiments](#)
 - 1.7 [Ethical considerations](#)
 - 1.8 [Who can submit and how](#)
- 2 [Proposals: what to submit and how](#)
 - 2.1 [Letter of Intent](#)
 - 2.2 [Proposal Guidelines](#)
 - 2.3 [Submission](#)
 - 2.4 [Submission Addresses](#)
- 3 [Additional Science Opportunities in upcoming Announcements](#)
- 4 [Points of Contacts](#)

1 Description of the Announcement

1.1 Introduction

Europe participates in the development of the International Space Station (ISS) via the European Space Agency, ESA.

The scientific utilisation of the ISS was started in the second half of 2000. The full operational status of the Space Station will not be achieved before the end of 2007. However, in the intermediate term utilisation opportunities also exist. Not only the development of the infrastructure elements of the ISS but also the utilisation of the Station is accompanied by a trend towards world-wide scientific and technological co-operation.

In order to enable and enhance world wide co-operation in space life sciences, an International Space Life Sciences Working Group (ISLSWG) has been established 1995. The ISLSWG includes the space agencies of the USA (NASA), Europe (ESA), Japan (JAXA), Canada (CSA) and Ukraine (NSAU)

and those European national space agencies (CNES of France and DLR of Germany), which for many years have also had their own significant national space life sciences programmes in addition to being the space agencies of ESA member states.

This world-wide coordination, which started with the screening of existing space hardware and the exchange of information on the planning for development of new hardware, resulted in having a common pool of research equipment on the ISS. In addition, the regular issuing of joint space research announcements (RA) and the evaluation of the proposals by an international peer group was agreed upon.

The fatal Columbia Space Shuttle accident in February 2003 and the subsequent temporary discontinuation of Shuttle flights have severely affected the possibilities to upload scientific equipment to ISS, which consequently hinders the conduct of scientific experiments. Plans are being developed that aim to minimize the effects of the current absence of Shuttle flights. Alternative means of uploading equipment are being investigated *i.e.* by using Russian vehicles like the Soyuz or Progress, or the ESA developed ATV (Automated Transfer Vehicle). It has however to be pointed out that even though alternative solutions are being worked out, there will be limitations regarding performance of experiments on ISS in the near future.

Some of the limitations regarding physiological experiments on human test subjects *i.e.* Astronauts, are stated in the Flight Experiments Information Package [FEIP](#). In addition it has to be emphasized that the feasibility of a flight experiment increases if available facilities and devices, which are described in the [FEIP](#), are used to collect and record experimental data.

In order to increase the crew time available for scientific experiments it is the intention to also make use of Soyuz Taxi Flights: These are manned flights to the ISS, offering approximately 5 effective on-board-ISS experiment days (total length of flight is around 10 days). Limited and simple experimentation can be accommodated. Sample return immediately after termination of the mission will be extremely limited and without temperature control capability (*i.e.* at room temperature). These flights will be best suited for monitoring human adaptation process on orbit, or the activation of (semi-) automatic experiments. Taxi flights are well suited for activities pre- and post-flight relating to whichever discipline can be argued to be influenced by a 10-day space flight exposure. Crew time can also be used to perform experiments using hardware already onboard the ISS or brought up by the re-supply ship ("Progress" flight).

1.2 Announcement Objectives

The guiding principles of this international research cooperation are to:

- Promote the highest quality of scientific investigation and scientific return from space experiments.

- Optimise the utilisation of resources by avoiding unnecessary duplication of equipment and by sharing equipment and flight opportunities.
- Maximise the access to space in a period of operational constraints.

General information on this Research Announcement is contained in the "Space Life Sciences Flight Experiments Information Package" [FEIP](#) which document contains the following main sections:

- Description of conditions and evaluation process
- Description of the available flight opportunities and facilities
- Generic application forms
- Instructions for proposal preparation

Experiments requiring up to 120 (180) days exposure to the space environment are to be solicited. Proposals must comply with the requirements associated with the current space flight program. Investigators of flight experiments should consult the [FEIP](#) for this information.

Two types of flight experiments are currently solicited: (1) pre- and post-mission activities involving data collection prior to and on return from space, and (2) on-orbit experiments that can be implemented on the space platforms of the Space Shuttle or the ISS. Proposals must be compatible with the operational constraints and capabilities of the International Space Station and the Space Shuttle. The [FEIP](#) provides detailed information on these constraints as well as a description of the unique aspects of the evaluation and selection process for flight experiments.

1.3 Facilities available for Life Science

ESA is contributing research equipment to the common pool of life sciences facilities on the ISS with a part of the equipment being offered via national contributions.

Experiments can make use of the ESA Life Science **ISS Flight Facilities**, namely:

- [European Physiology Modules](#)
- [European Modular Cultivation System](#)
- [KUBIK](#)
- [FLYWHEEL](#)
- [MARES](#)
- [Pulmonary Function System](#)
- [Percutaneous Electrical Muscle Stimulator](#)
- [Handgrip/Pinch Force Dynamometer](#)
- [MATROSHKA](#)
- [EXPOSE](#)

In addition to ESA provided facilities, please consult the [FEIP](#) for the complete ISS facility inventory:

NB: All scientists to whom this Announcement is addressed can have access to all facilities described in this document.

The [BIOLAB](#) facility is not yet available for new experiments in the period 2004-2006, but will be a very important element in subsequent Research Announcements.

1.4 Biological Experiments

Experiments in Biology concern Biotechnology, Plant Physiology and Cell and Developmental Biology.

This Research Announcement mainly solicits proposals for participation in flight opportunities in Biology using model organisms (yeast *Saccharomyces cerevisiae*, nematode *Caenorhabditis elegans*, plants *Arabidopsis thaliana* and *Brassica rapa*). Flight experiment constraints are elaborated and are described in detail in the [FEIP](#).

The intent of the model specimens approach for experimenters on the ISS is to maximise the science return from the ISS by performing as many experiments as possible during the flight opportunity period. To that end, following the selection of individual proposals, the experiments will enter a Definition phase. During this phase, the principal investigators/ team coordinator will attend a workshop where teams will be formed that are compatible regarding specimens, operations, data (video, gas samples, etc), and treatment and sharing of biological samples. It is likely that some compromises will be required regarding experimental design and content. Investigators are encouraged to identify/propose teaming agreements, if possible, prior to submitting the proposal.

It has to be pointed out that those Proposals for Biological experiments that are not compliant with the focused approach described above will also be accepted and evaluated regarding scientific merits and feasibility. However it should be noted that selected experiments outside the described focus will have less likelihood to be implemented in the given time frame *i.e.* 2004-2006.

1.5 Effects of Radiation

The effect of Cosmic and Solar Radiation on organic molecules, microbes, and humans is of high interest in the fields of Exobiology and Radiation Biology. Two facilities, mounted outside ISS, are available for experiments in these fields.

[EXPOSE](#) is a second generation multi-user exposure facility developed for flight on the International Space Station ISS. The box shaped facility will be installed on an external structure on the ISS. Experiment samples will be accommodated in several trays in various of sample compartments behind

quartz or magnesium fluoride optical windows. The sample compartments are partly equipped with entrance optics and filters. In space they are vented or kept under a controlled gas atmosphere. The facility will be installed on a Sun pointing device.

[MATROSHKA](#) is a facility that simulates as exactly as possible an astronaut while he leaves the 'protective' area of the spaceship in order to carry out work in free space. The objective is to measure particle fluence and energy spectra, dose and dose rates outside and inside a human phantom over the period of a year. The data are needed to improve the determination of radiation exposure of an astronaut performing a space walk.

NB There is no information regarding these two facilities in the [FEIP](#), please use the hyperlinks for [EXPOSE](#) and [MATROSHKA](#) to gain further information.

1.6 Physiological Experiments

Experiments in Physiology concern Integrated Physiology, Bone and Muscle Physiology and Neuroscience.

In Physiological Sciences ESA is not prioritising between different sub-areas or research foci. Best science as defined in the peer review process with feasible protocols will be given preference for implementation.

To enhance the scientific return it is the intention to form teams of investigators with similar scientific questions and/or protocols, whenever this is feasible. This will be arranged during the [Definition](#) phase where selected proposals are characterised regarding the requirements and the implementation approaches and options.

At the current stage of the ISS, with the ongoing assembly, the main parts of the physiological experiments are dependent on the participation of Astronauts both as research subjects and as operators. This places an important constraint on this type of research, which is specified in some detail in [FEIP](#) section 1.4.

Other Space Agencies apart from ESA may have other programmatic priorities regarding experiments concerning Physiology. Each agency has a given share of the resources available for science on ISS, and the likelihood for an experiment to be implemented will increase if the scientific objective is in line with the programmatic objectives of several agencies. Thus it might be meaningful for the Proposer to be aware of these priorities especially [NASA priorities](#) since it has the largest share of the available resources. (see also [FEIP](#) section 4.3 and 4.4)

1.7 Ethical considerations

This section only concerns research on human subjects.

A statement from the Proposer's institution is required which states that the proposed work will meet all local requirements concerning research on human subjects. Safety assessments, including a description of possible hazardous

situations for the test subjects and the foreseen countermeasures, must be provided.

In addition to this statement, a letter signed by the chairperson of the Institutional Review Board / Ethics Committee (IRB) regarding approval of the experimental protocol that includes human subjects, should be included with each copy of the proposal. In case this letter is not available at the time of the deadline, at least the proof of submission to the IRB should be provided with the proposal.

1.8 Who can submit and how

At European level, this Announcement addresses academic and industry researchers of countries contributing to the ESA's programme on Life and Physical Sciences in Space (ELIPS). These are: Austria, Belgium, Denmark, France, Germany, Italy, Ireland, Norway, Spain, Sweden, Switzerland, and The Netherlands. For these scientists, ESA can provide the flight opportunities, and finance the development of the specific hardware required for experimenting on the ISS. However, please note that any laboratory work, necessary for ground based research to prepare experiments will be funded by the national space organisations of the countries the scientists originate from. Similarly, support to participate in meetings for the development of instruments sponsored by ESA, and to attend launch campaigns, also has to be provided by the national space organisations.

Scientists from ESA Member States that do not contribute to the ELIPS Programme (presently Finland, Portugal, and the United Kingdom), and scientists from other European countries having a cooperation agreement with ESA, are encouraged to enquire with their national space organisation about the conditions for their participation in proposals to ESA.

ESA strongly advises investigators to submit their proposal to their national bodies in parallel with their application in response to this RA, in order to initiate the application for national funding as early as possible. If the proposed experiment is selected, a proof of appropriate funding is mandatory in order to commence the definition phase.

A list of national points of contact is provided with this announcement.

For European scientist there is therefore no need to fill in Form C, D and E described in the [FEIP](#).

2. Proposals: What to submit and how

2.1 Notice of Intent

To facilitate proposal processing, potential investigators are requested to confirm their plans to submit a proposal in response to this Announcement. A Notice of Intent (NOI), which is not binding, should be sent by:

2nd March 2004

Note that these Notices of Intent will play an essential role in the definition of the future Research Plan and Programmes of the Agency, which will take place during summer 2004.

NOI's should be submitted via email to:

noi@hq.nasa.gov, msmlife@estec.esa.nl and to the appropriate National Funding Authority, see below (section 2.4).

The subject heading of the e-mail message should read "Notice of Intent-ILSRA2004."

NOIs should include the following information:

Principal Investigator's/ team coordinator's name, email, phone number and institution

Co-Investigator's/ team member's names and institutions

Project Title

Project Summary

Funding Agency

Science Area/Organism

2.2 Proposal Guidelines

The specification on how to accurately produce a proposal is described in the Flight Experiments Information Package ([FEIP](#)).

2.3 Submission

Proposals may not be submitted electronically, paper based proposals together with a digital version on diskette should be sent by (courier-) mail in order to be accepted for review.

Notice of Intent and Proposals are to be sent in parallel to three different organisations:

To NASA Peer Review Service

NASA organises the Peer Review that will be conducted by a panel of international experts. Submission of:

E-mail containing Notice of Intent

by

2nd March, 2004

1 original and 24 copies of the Proposal

by

5th May, 2004

To the European Space Agency
Submission of:

E-mail containing Notice of Intent
by
2nd March, 2004

1 copy of the Proposal
by
5th May, 2004

To the National Funding Authority
Submission of:

E-mail containing Notice of Intent
by
2nd March, 2004

1 copy of the Proposal
by
5th May, 2004

2.4 Submission Addresses

NASA Peer Review Services

NASA Peer Review Services
SUBJECT: Flight Experiments in Space Life Sciences
Announcement Identifier: ILSRA 2004 Flight Experiments in Space Life
Sciences
500 E Street, SW
Suite 200
Washington, DC 20024-0001
Phone: +1-202-479-9030
Fax: +1-202-479-0511
E-mail: TBD

Proposals must be received in Washington by 5th May

2004, 16:30 h Eastern Time.

Proposals that are not sent through the US Postal Service, but hand-delivered or sent by commercial delivery or courier services, are to be delivered to the above address between 8:00 h and 16:30 h. The telephone number, 202-479-9030, may be used when required for reference by delivery services. This service cannot receive deliveries on Saturdays, Sundays, or federal holidays.

Upon receiving a proposal, NPRS will acknowledge receipt by ordinary mail to the proposer confirming its arrival.

In order to be accepted as a complete submission, proposals must include completed copies of the appropriate forms described in section 5 of the "Space Life Sciences Flight Experiments Information Package".

ESA

European Space Agency
Secretariat MSM-GA
Announcement Identifier: ESA-ILSRA-2004
P.O. Box 299, NL-2200 AG Noordwijk, the Netherlands

Geographic address (e.g. for delivery by courier service):
ESTEC, Keplerlaan 1, NL-2201 AZ Noordwijk,
The Netherlands
Fax: +31 (71) 565 3661
Tel: +31 71 565 35 17
E-mail: msmlife@estec.esa.nl

National Funding Authority

The Letter of Intent and the Proposal must be sent by the experiment proposer by the same due date to the *national delegate to the ESA Programme Board of Human Spaceflight and Research* of his/her country or to the Life Sciences representative of the National Space Agency. These delegates/agency representatives are listed below.

AUSTRIA

Mr. Werner Balogh
Austrian Space Agency
Canovagasse 7
Postfach 53
A-1010 WIEN

tel.: + 43.1.403 81 77 20
fax: + 43.1.405 82 28
wbalogh@asaspace.at

BELGIUM

Mr. Pierre Coquay
Services fédéraux des affaires
scientifiques, techniques et culturelles

tel. + 32.2.238 35 86
fax + 32.2.230 59 12
coqu@belspo.be

8, rue de la Science
B-1000 Bruxelles

Mr. Thomas Andersen
DAMEC Research A/S
Lindvedvej 75
DK-5260 Odense S
Denmark

DENMARK

tel. + 45.86.69.40.85
fax + 45.86.69.40.95
tandersen@damec.dk

Mme Arlène Ammar-Israel
Centre National d'Etudes Spatiales
(DP/MP/SC)
2, Place Maurice Quentin
Paris 75039 Cedex 01

FRANCE

tel. + 33.1.44.76.75 78
fax + 33.1.44.76.78.59
arlene.ammarisrael@cnes.fr

Mr. Günter Ruyters
DLR
Königswinterer Strasse 522-524
Postfach 30 03 64
D-53227 Bonn-Oberkassel

GERMANY

tel. + 49.228.447.214
fax + 49.228.447 735
Guenter.Ruyters@dlr.de

Mr. Brian O'Donnell
International Programmes Division
Enterprise Ireland
Glasnevin
DUBLIN 9

IRELAND

tel.: + 353 1 808 2753
fax: + 353 1 837 0178
brian.odonnell@enterprise-ireland.com

Mr. J. Sabbagh
Agenzia Spaziale Italiana (ASI)
Viale Liegi 26
I-ROME 00198

ITALY

tel. + 39.06.8567 312
fax + 39.06.8543 871
sabbagh@asi.it

Mr. Rolf P. de Groot
SRON
Sorbonnelaan 2,
NL - 3584 CA Utrecht

THE NETHERLANDS

tel. + 31.30.253.85.91
fax + 31.30.254.08.60
r.degroot@sron.nl

Mr. Bo Andersen
Norwegian Space Centre
Drammensveien 165
P.O. Box 113 Skoyen
N-0212 Oslo - Norway

NORWAY

tel. + 47.22.51.18.00
fax + 47.22.51.18.01
bo@spacecentre.no

Mr Miguel Angel Pérez
CDTI
C/Cid, nº 4

SPAIN

tel. + 34.91.581.55.41
fax + 34.91.581.55.84
mapl@cdti.es

E – 20881 Madrid

SWEDEN

Mr. Per Magnusson
Swedish Board for Space Activities
P.O. Box 4006
S – 171 04 Solna

tel. + 46.8.627.64.80
fax + 46.8.627.50 14
per.magnusson@snsb.se

SWITZERLAND

Mr Daniel Neuenschwander
International Matters, Manned Space
& Microgravity
Swiss Space Office (SSO)
Hallwylstrasse 4
CH-3003 Bern

tel. + 41.31.324.10.72
fax + 41.31.324.10.73

Daniel.neuenschwander@sso.admin.ch

3 Additional Science Opportunities in upcoming Announcements

ESA also offers other types of life science opportunities.

[Ground-Based Facilities](#) can be used for science in a large variety of fields.

[Parabolic flights](#) are used to conduct short-term microgravity scientific and technological investigations, to test instrumentation prior to use in space and to validate operational and experimental procedures.

[Sounding rockets](#) provide microgravity for up to 15 min and experiments can be performed during this time.

Information or how to solicit proposals for research using these facilities will be announced later this spring.

4 Points of Contact

Administrative questions regarding this Announcement of Opportunity may be directed to

European Space Agency
Secretariat MSM-GA – ESA ILSRA 2004
ESTEC
Keplerlaan 1
2201 AZ Noordwijk
The Netherlands

Fax: +31 (71) 565 3661

E-mail: msmlife@estec.esa.nl

For questions related to programmatic or scientific aspects please contact:

European Space Agency
P.Sundblad
MSM-GA
ESTEC
Keplerlaan 1
2201 AZ Noordwijk
The Netherlands
Tel. +31 (71) 565 5187
Fax: +31 (71) 565 3661
E-mail: msmlife@estec.esa.nl

ESA e-mailing list

If you would like to receive any further information, future Research Announcements or announcements of symposia, conferences, workshop, we invite you to be registered in the ESA mailing list. You can either directly register in the ESA mailing database via Internet :
<http://www.estec.esa.int/spaceflight/map/map/registr.htm>

Or you download the ESA mailing list registration form, fill it in and send it back to ESA in one of the following ways:

- fax to +31 (71) 565 36 61
- e-mail to msmlife@estec.esa.nl
- mail to the Secretariat MSM-GA at the above indicated address