2 THE ACCESS PROCESSES

2.1 Overview

This section presents the various routes by which interested users can access any of the five low-gravity platforms and/or utilise specific ground based facilities, including bed-rest capabilities. The focus is mainly on access through the European Space Agency (ESA) (section 2.2), but in addition, complementary routes for specific facilities are briefly summarised for completeness (see section 2.3).
ESA issues at regular intervals so-called Announcements of Opportunity (also known as Research Announcements) - these are the official access route for institutional users to the utilisation of the various research facilities that are managed by the ESA Directorate of Human Spaceflight, Microgravity and Exploration Programmes. In addition to this "baseline" approach there is also now a "fast track" Continuously Open Research Announcement route that may be followed for specific categories of research.
ESA has allocated a large portion of the European ISS resources to institutional users, while a smaller amount is also available to commercial users. The access route for commercial users is described in section 2.2.6. Additional information regarding the commercial use of the ISS can also be found in section 7.4.5.
Students can also submit proposals to perform research on any of the five low-gravity platforms, through the annual ESA student parabolic flight campaign or via the SUCCESS and SUCCESS Special Opportunities programmes (see section 2.2.7).

2.2 European Space Agency Access Routes

2.2.1 Periodic Announcements of Opportunity

Proposals are normally solicited through the "baseline" Announcements of Opportunity (AOs), issued by ESA at regular intervals. The AOs themselves and the detailed formal processes behind them are essentially platform independent, and the choice of the most suitable platform for the user will be performed under the leadership of ESA during the definition phases immediately following project selection.
The contact details for submittal of proposals will be indicated in each respective AO. Users should refer to the following web site for information on the latest Announcements of Opportunity:
http://spaceflight.esa.int/users/file.cfm?filename=coord-ao-latest

Users usually have about 3-5 months to submit a proposal following an announcement, while another 3-6 months are required for the review process after submittal.

2.2.1.1 Contents of a Proposal

The exact structure and contents of the proposal package will vary from AO to AO, but in general they will consist of the following:

2.2.1.1.1 Cover Page

The cover page should contain:

- The complete title of the project;
- The name, telephone number, fax number and e-mail address of the project coordinator;
- The legal name and address of the project coordinator's organisation;
- Carrier type;
- Full names of collaborators and their organisations;
- Information regarding required human test subjects (if any);
- The signature of the responsible official or authorised representative of the organisation or any other person authorised to legally bind the organisation.

2.2.1.1.2 Proposal Abstract

A brief description of the application stating the broad, long-term objectives and specific aims of the proposed work. The abstract should concisely describe the research design and methods for achieving these objectives and aims. This is meant to serve as a succinct and accurate description of the proposed work when separated from the application. The abstract should not contain more than 300 words.

2.2.1.1.3 Project Description

The Project Description should be approximately 10 to 15 pages long using regular double-spaced text. The proposal should contain sufficient detail to enable a reviewer to make informed judgements about the overall merit of the proposed research and about the probability that the investigators will be able to accomplish their stated objectives within the resources requested and with their own resources. The description must include:

- The scientific background and a clear explanation of the microgravity relevance of the proposed research;
- The schedule envisaged to perform this research.

2.2.1.1.4 Work Package Breakdown and Financial Form

The users should summarise all activities and costs into work packages, preferably in tabular format. Each work package (WP) description should include the following:

- WP number;
- WP Title;
- Name of responsible institution;
- Start and End date;
- Costs related to Manpower, Travel, Equipment and Consumables;
- WP task description;
- Description of WP deliverables.

A detailed cost proposal description for each individual team member as well as the overall budgets for the whole project covering the first 3 years of the project must also be submitted.

2.2.1.1.5 Biographical Sketches

For each key team member, a biographical sketch containing the following information must be submitted to ESA:

- Name;
- Position and Title;
- Education/Training (including Institutes and location, degrees, years attended, fields of study);
- A brief summary of research and professional experience.

2.2.1.1.6 Facilities and Equipment

This section describes the available facilities and major items of equipment specially adapted or suited to the proposed project, and any additional major equipment that will be required. Before requesting a major item of capital equipment, coordinators should determine if sharing or loan of equipment already within the organisation is a feasible alternative to purchase. Where such arrangements cannot be made, the proposal should so state. The need for items that can be typically used for research and non-research purposes should be explained.

2.2.1.2 Proposal Evaluation

The evaluation of submitted proposals is performed by Peer Boards. The list of Peers for each Peer Board shall be drawn up from the Peer Pool by ESA in consultation with the appropriate Working Group based on the sub-disciplines represented in the Letters of Intent and the final proposals received. The number of peers shall be determined such that each peer will have to review in detail a maximum of 10 proposals, with a written report

submitted before the Peer Board meeting. Concerning optimum composition of the Peer Board and optimum competence of its members the peers shall have good reputation in the mother discipline and no involvement in on-going space projects related to the proposals under review.
ESA shall be responsible for the practicalities of organising Peer Board meetings and will normally provide the ESA Secretary for the Boards. The practicalities shall include, e.g., locations and numbers of meetings per review, role of external support staff for administrative assistance and role of teleconferencing/email.
The members of the Board itself shall elect a Chairman for each Peer Board.
Each reviewer shall read all Proposals. The Board shall nominate at least three Primary Reviewers for each proposal, charged with providing a written assessment of that proposal and with fully scoring the proposal. During the final meeting of the Board other reviewers may provide comments especially in the case of proposals where it has been difficult to find consensus among the Primary Reviewers. It is a requirement for the Peer Board to reach consensus of opinion on all individual proposals, including a final rating on all the applicable criteria.

As regards confidentiality of proposals the Peer reviewers shall:

- Sign a confidentiality agreement;
- Agree that certain parts of the proposal indicated by the Proposer can only be viewed and not copied;
- Recognise that certain parts of the proposal have a specific commercial interest which shall remain confidential (in particular in case of application-oriented projects);
- Respect the intellectual property of the Proposer.

The Chairman of the Peer Board and the Executive Secretary shall ensure that a written report is produced on the occasion of the final deliberations of the Peer Board, recording the overall assessment of the Board regarding each proposal and the comments of each Primary Reviewer regarding the proposals assigned to them. This written report is held in a secure file by ESA.

2.2.1.3 Evaluation Criteria

The Main Selection Criteria and the means to assess proposals against them are:

- For all Proposals:
  - Scientific Merit – assessed by Independent Peer Review;
  - Space Relevance – assessed by Independent Peer Review;
  - Technical Feasibility – assessed by In-house Assessment (ESA).

- Additionally, for Application-Oriented Proposals:
  - Application Potential – assessed by Independent Peer Review.

2.2.1.4 Contacts

For general information regarding scientific access to the ISS and the other ESA sponsored low-gravity platforms, users can contact the Head of the ISS Utilisation and Promotion Division (HME-GA) at the following:

Dr. Marc Heppener
HME-GA
Directorate of Human Spaceflight, Microgravity and Exploration Programmes
European Space Agency
Keplerlaan 1
2201 AZ Noordwijk
The Netherlands
Tel: +31 71 565 5117
Fax: +31 71 565 3661
E-mail: marc.heppener@esa.int

For specific information regarding solicited proposals please contact the following ESA scientific coordinators:

Life Sciences:
Dr. Didier Schmitt
HME-GAL
Directorate of Human Spaceflight, Microgravity and Exploration Programmes
European Space Agency
Keplerlaan 1
2201 AZ Noordwijk
The Netherlands
Tel: +31 71 565 4888/3517
Fax: +31 71 565 3661
E-mail: didier.schmitt@esa.int

Physical Sciences:
Dr. Olivier Minster
HME-GAP
Directorate of Human Spaceflight, Microgravity and Exploration Programmes
European Space Agency
Keplerlaan 1
2201 AZ Noordwijk
The Netherlands
Tel: +31 71 565 4764/3517
Fax: +31 71 565 3661
E-mail: olivier.minster@esa.int

For further information on sounding rockets contact the ESA Sounding Rocket Project Manager:

Wolfgang Herfs
HME-GE
Directorate of Human Spaceflight, Microgravity and Exploration Programmes
European Space Agency
Keplerlaan 1
2201 AZ Noordwijk
The Netherlands
Tel: +31 71 565 4129
Fax: +31 71 565 3141
E-mail: wolfgang.herfs@esa.int

For further information on the Foton spacecraft contact the ESA Foton Technical Officer:

Antonio Verga
HME-GMS
Directorate of Human Spaceflight, Microgravity and Exploration Programmes
European Space Agency
Keplerlaan 1
2201 AZ Noordwijk
The Netherlands
Tel: +31 71 565 3098
Fax: +31 71 565 3141
E-mail: antonio.verga@esa.int

For further information on the International Space Station contact either one of the following:

Giuseppe Reibaldi
Head of the Microgravity Facilities for Columbus Division (HME-GF)
Directorate of Human Spaceflight, Microgravity and Exploration Programmes
European Space Agency
Keplerlaan 1
2201 AZ Noordwijk
The Netherlands
Tel: +31 71 565 3996
Fax: +31 71 565 3111
E-mail: giuseppe.reibaldi@esa.int

Josef Winter
Head of Payloads Division (HME-GM)
Directorate of Human Spaceflight, Microgravity and Exploration Programmes
European Space Agency
Keplerlaan 1
2201 AZ Noordwijk
The Netherlands
Tel: +31 71 565 8243
Fax: +31 71 565 3141
E-mail: josef.winter@esa.int

2.2.2 Continuously Open Research Announcement

In July 2004, ESA released a Continuously Open Research Announcement for access to ground based facilities, which will remain permanently open until further notice. Scientists can apply to this announcement as the need arises according to the schedule of their ongoing research. The research announcement is open to all scientific disciplines, i.e. life sciences, physical sciences, and interdisciplinary sciences.
In order to better cope with the need to access parabolic flights rapidly, ESA has implemented a Fast-Track evaluation process. Given the substantial cost for ESA of a flight/drop campaign, this fast-track will only apply when the scientific or technical objectives can be achieved within one single campaign. The track will only apply for proposals with a maximum cost, for ESA, of 50 k€, and users must include certified supporting budgetary information in the proposal.
For the evaluation of fast-track proposals, ESA will make use of its Life or Physical Sciences Working Groups together with an in-house feasibility assessment. For interdisciplinary proposals merging the study of physico-chemical processes within biological systems, relevant expertise from the two working groups may be sought. For this fast-track process, the proposal coordinator may expect to receive confirmation of selection/rejection of his/her proposal within a period of nominally two months.
Any scientists from the ELIPS programme participating member states (Austria, Belgium, Denmark, France, Germany, Ireland, Italy, The Netherlands, Norway, Spain, Sweden, and Switzerland), either from the academic or industrial sector, may apply to the announcement. Nationals from other ESA member states may participate in proposals as team members. The latter should consult with their own national authorities regarding intentions to participate in future phases of ESA's utilisation programmes. Nationals from other states, and in particular ISS partners (Canada, Japan, Russia, USA), should consult with their national space agency on their intention to support participation in the project.
The proposal form for users wishing to apply to the Continuously Open Research announcement can be downloaded at the following web site: http://spaceflight.esa.int/users/file.cfm?filename=miss-parafl-fut

2.2.2.1.1 Evaluation Criteria

In order to facilitate both the writing of the proposal and the evaluation process, evaluation criteria have been used to organise and structure the proposal form. When necessary, notes within the body of the test are added to provide a clear and satisfactory description of the 5 selection criteria. These 5 criteria are standard in any ESA research announcement and are summarised as follows:

- Addressing the general objectives of the continuously open call and justifications for experimenting in space simulating conditions;
- Scientific and technical aspects;
- Qualification of the coordinator and partners related to the tasks and added scientific value from the consortium and international approach;
- Management;
- Mobilisation of resources.

On a scale of 1 to 5 (where 5 represents "Outstanding"), a minimal score for criteria 1, 3, 4 and 5 is set to 3/5, and for criterion 2, it is set to 4/5. Weighting is identical for all 5 criteria.
Following confirmation of selection and readiness for support by ESA, the Coordinator should provide a Letter of Acceptance stating that all necessary resources will be made available to conduct the experiment. Failing to provide this letter within 6 weeks after notification by ESA will lead to automatic deselection of the proposal.
For further information regarding the financial, scientific and administrative aspects of this research announcement, users are requested to visit the following web site for detailed information:
http://spaceflight.esa.int/users/file.cfm?filename=coord-ao-cora

2.2.2.2 Contacts

Programmatic questions regarding the Continuously Open Research Announcement process may be addressed to:

Dr. Roger Binot
HME-GA
Directorate of Human Spaceflight, Microgravity and Exploration Programmes
European Space Agency
Keplerlaan 1
2201 AZ Noordwijk
The Netherlands
Tel: +31 71 565 4815
E-mail: roger.binot@esa.int

For further information on parabolic flights contact the ESA Parabolic Flight Coordinator:

Dr. Vladimir Pletser
HME-GML
Directorate of Human Spaceflight, Microgravity and Exploration Programmes
European Space Agency
Keplerlaan 1
2201 AZ Noordwijk
The Netherlands
Tel: +31 71 565 3316
Fax: +31 71 565 3141
E-mail: vladimir.pletser@esa.int

For further information on the ZARM drop tower contact:

Christian Eigenbrod
ZARM – Drop Tower Operation and Service Company mbH
c/o University of Bremen
Am Fallturm
28359 Bremen
Germany

Or alternatively send an email to: fab@zarm.uni-bremen.de

2.2.3 Coordinated Research

It should be noted that proposals can range in their extent from one experiment for one platform (e.g. self-standing research using drop towers or sounding rockets), through a series of experiments involving a number of different platforms. Proposals of this nature are actively encouraged by ESA, as this improves the overall chances of implementing a successful experiment.
It is also one of the major aims of ESA to encourage the linking together of traditionally separate research fields for example, materials science and fluid science. The intention being to harmonise the proposed research to obtain the best possible science with a minimum of resources and to encourage science teaming.

2.2.4 Topical Teams

An important ingredient of the ESA strategy towards research is the concept of Topical Teams of European scientists that perform preparatory activities during an "incubation phase" in anticipation of an Announcement of Opportunity. These Topical Teams have as objectives:

- To anticipate on the long term development of research in their topic;
- To assess the relevance of the space environment as a tool for investigations and determine the specifications of the instruments required for such investigations;
- To identify industries that could benefit from the envisaged research and associate them to the definition of the objectives and the strategy of a space relevant project;
- To assess the relevance of the project to the Framework Programmes of the European Commission and ultimately;
- To submit research programme proposals in association with their industry partners to ESA in response to regular Announcements of Opportunity and, in parallel, to the European Commission as appropriate.

Several Topical Teams are currently active in both Life and Physical Sciences and one of the objectives of AOs is to enable them to formulate and submit joint research programme proposals that result from the incubation phase. It should be noted that Topical Teams are open structures so that interested scientists can contact their coordinators at any time and seek to join any of the active teams**.**
For more information regarding Topical Teams, users can consult the following web site:
http://spaceflight.esa.int/users/file.cfm?filename=coord-tt

2.2.5 Fundamental and Applied Research Programmes

With AOs, ESA solicits Research programme proposals encompassing a space experimentation element aiming at a critical advancement of knowledge in various scientific disciplines. Projects are triggered by the fact that space offers a unique environment to realise critical experiments that are very difficult if not impossible to realise on the ground, or not at an adequate level of accuracy. However, the scientific approach developed by the projects should be such that no ambiguity remains as to which parameter has influenced the difference in measurements. This calls for a detailed analysis of the environment that prevails in space in comparison with the ground based environment, and its effect on the process or phenomenon under investigation. The end results should enable scientists to challenge, or validate current theories and stimulate further development towards a better understanding of fundamental principles.
The overall strategic objective of the Microgravity Applications Programme (MAP) is to encourage application-looking research with industry involvement in order to generate a European activity using the International Space Station as a facility for application-looking research and eventually for industrial R&D. The objective is to develop projects in order to, among other things:

- Optimise applied ground-based processes;
- Generate benchmark data and materials samples and physical processes relevant to industrial R&D;
- Investigate biological or physiological changes associated to long-duration spaceflight, which are of interest for clinical applications on Earth;
- Investigate the basic role of gravity in cell differentiation and organisation, and the application potentials in biomedicine.

The development of MAP projects took into account the following key elements:

- Support is provided during the full cycle of definition and development of dedicated flight experiment hardware, flight and operation, results analysis and exploitation;
- The time leading up to the actual generation of relevant results on the ISS to be already productive and beneficial to industrial participants inasmuch as ground-based research is supported and preparatory or precursor flight experiments are adequately planned;
- Full and fair Intellectual Property Rights protection to be assured for all partners, be they from academia or industry.

The MAP programme of ESA currently financially supports 32 projects in Physical Sciences, Life Sciences, and Interdisciplinary Sciences, beyond the nominal support with flight opportunities and instrument development. These projects involve industry in the definition of their objectives, in the majority of cases in the framework of Topical Teams. All running projects have demonstrated to industry how ground-based research complemented with well-focused space-borne experiments and measurements can generate unique results of significant interest to their own R&D. A number of features of the running MAP projects are actually being extrapolated to fundamental research projects in striving towards excellence in research in space.
All proposing teams should identify the most effective way of achieving the goal of the project; this encompasses a first phase during which the definition of the experimental programme (including the detailed definition of the instrument and the selection of the best-suited carrier) is consolidated on the basis of extensive ground-based testing and also modelling; an implementation phase during which the instrument is developed by industry, launched and operated in space and an exploitation phase for the complete analysis of all results and their synthesis. Each member of a team is expected to define in detail his unique contribution to the project, and at which stage during the project.

2.2.6 Commercial Access

2.2.6.1 The Open Call for Commercial Proposals

The mechanism set up by ESA for soliciting commercial projects related to the ISS is called “Open Call for Commercial Proposals”. The Open Call is a permanent and non-prescriptive call for business ideas, which allows potential customers to submit at any time to ESA any kind of business idea aiming at the commercial utilisation of the ISS. There is a very broad scope for commercial ideas; however, specific technical, ethical or financial constraints may arise due to the particular characteristics of the project concerned and these will be considered on a case-by-case basis.

2.2.6.2 The Commercial Proposal – Structure and Contents

The accepted response to the Open Call is the submission of a written Commercial Proposal to the Commercial Promotion Office. A Commercial Proposal should always clearly describe the project, its objectives, its on-ground and on-board plan of activities and the project’s organisational structure. In addition to this, the Commercial Proposal should highlight the technical, ethical and financial aspects of the project.
If the financial part of the project requires an in-cash or in-kind form of Promotion Support from ESA, a Business Plan must be attached to the Commercial Proposal. In this case ESA is being asked to co-invest in the venture, and must therefore assess its level of investment and potential return. The Business Plan should therefore contain detailed information about the venture, the organisation, the project financing and the risk assessment.
In order to assist customers to translate the original business idea into a concrete Commercial Proposal and to provide to ESA the required financial information as part of the Business Plan, the Commercial Promotion Office has developed detailed guidelines.
Both the Commercial Proposal Guidelines and the Business Plan Guidelines can be downloaded from the Commercial Promotion Office website: http://www.esa.int/issbusiness

2.2.6.3 Evaluation Procedure

Upon submission of a proposal the Commercial Promotion Office performs an initial appraisal of the submitted documentation, which consists of a preliminary check of the proposal against the formal requirements. If all formal conditions are met and the information provided is considered sufficient to perform an evaluation, the Commercial Promotion Office registers and safely stores the Commercial Proposal before calling for a Commercial Evaluation Team (CET), which evaluates the Proposals on a 'first-come-first-served' basis.
Confidentiality is guaranteed at all stages of the process. Both internal ESA staff and external experts can only take part in a CET after they have signed a Declaration of Secrecy and Non-interest with which they declare to have no personal interest in the outcome of the CET and to abide by the obligation of secrecy necessary due to the commercial nature of the project.
CET participants decide by consensus according to the evaluation criteria and procedural provisions set forth in the 'Evaluation Procedure for Commercial Proposals'. All proposals are evaluated in order to determine the technical feasibility, ethical acceptability and financial viability of the proposed project.
Depending on the content of the proposals, the CET may involve other bodies such as the ESA Medical Board, the Independent Commercial Activity Board and the Steering Board of the Co-operation Agreement.
Should the proposal be accepted, project details will be agreed upon during the contract negotiation phase prior to the project being implemented.

2.2.6.4 Contract Negotiation – Intellectual Property Rights (IPR) and Marketing Rights

Each contract must be tailored to address the specific contents, terms and conditions associated with each project. Among the various elements that the contract will address are the Intellectual Property Rights and Marketing Rights that the customer will acquire.

2.2.6.4.1 Intellectual Property Rights

The data resulting from activities undertaken on board the ISS are one of the key deliveries of commercial projects, especially in the case of applied R&D projects; different from the institutional access, the commercial route ensures the ownership to the customer of the Intellectual Property Rights that may be generated under the project. This prevents the dispersion of the intellectual properties and related economic benefits to different parties.

The intellectual property regime will depend fundamentally on the financing balance of the project:

- If the customer pays 100 % of the utilisation costs of the project, the customer will have exclusive ownership, access to and use of information, data and IPR resulting from the project;
- If the customer does not pay the 100 % of the utilisation costs and has been granted ESA Promotion Support, the customer will have the ownership of the information, data and IPR resulting from the project but ESA will retain access to and use of this information, data, and IPR. The rights of access and use of ESA will be subject to negotiation to secure the payment to ESA of either:
  - royalties on the exploitation of such information, data and IPR; or
  - fees in relation to the in-cash or in-kind Promotion Support granted by ESA.

2.2.6.4.2 Marketing Rights

Marketing Rights include those rights that are related to the act or process of promoting and selling products or services. Commercially oriented projects often seek for image association and for spreading of information for commercial purposes, therefore marketing rights become crucial. If a contract excludes the marketing rights, the customer may still have the right to use pictures or video footage taken onboard the ISS for his own internal use for scientific purposes; however, by negotiating the marketing rights the customer may obtain the right to use pictures or video footage also for commercial publication and advertising.
Most of the time, the subject of such pictures and video footage are ESA astronauts, which is why ESA has recently adopted a specific policy regulating the rights and duties of ESA staff members involved in commercial activities. If certain conditions of acceptability are met, customers can now benefit from the commercial

exploitation at corporate as well as at product level of the personal image of ESA astronauts (name, voice and physical appearance). Terms and conditions are carefully set in the contract and ultimately require the informed consent of the astronaut concerned. In addition, the customer could also acquire the right to use the ESA official emblem or one of the trademarks owned by ESA to promote the selling of its products or services.
In all cases, some ethical constraints apply. Among others, ESA will never be associated with activities that promote any of the following: alcohol, tobacco, religion, politics, intolerance, obscenity or gambling, nor violate laws or morals.

2.2.6.5 Commercial Project Implementation

Once the commercial contract has been signed, the implementation of the project can begin. The implementation of a commercial project (e.g. payload qualification & safety; astronaut training; baseline data collection; payload integration) is the same as that of an institutional type of experiment.
Each commercial project will be assigned to a specific ISS Space Mission, which include a number of other commercial projects and institutional experiments. Therefore, the implementation activities of the commercial project are integrated, coordinated and ultimately undertaken in relation to the ISS Space Mission formal milestones and activities. Therefore, the main parameters that affect the Commercial Project Implementation Plan are the launch date and the major review milestones of the ISS Space Mission with which the commercial project must comply to meet the flight opportunity.
As an example a low/average complexity commercial project will usually require 6 months of pre-flight activities, performance of the on-board activities as agreed with the customer and one month of post-flight activities including delivery of the resulting data. If a common 6-month post-flight marketing campaign is part of the project, the total implementation phase will remain within 14 months.
The overall lead-time could be shorter in the case of a payload re-flight. This is possible because it is expected that some of the activities performed in previous missions (e.g. payload qualification and testing, documentation such as the Flight Safety Data Package) remain valid for the re-flight. This would apply whatever the complexity of the commercial payload is.

2.2.6.6 Pricing

The Pricing Policy is based on the principle of marginal costs. In other words, customers pay to ESA the costs of utilisation of the ISS facilities and its related resources (e.g. crew time, energy, gas, water) and services (payload upload/download, data transmission). Prices for use of on-ground facilities, resources and services, which are required pre-and post-flight such as payload testing and qualification or data delivery may be charged by ESA or by one or more of the Co-operation Agreement Industrial Partners depending on who acts as provider.
Pricing information can be acquired from the Commercial Promotion Office and/or the Commercial Agents. Prices in relation to marketing rights are negotiated on a case-by-case basis. Prices become unchangeable upon signature of the contract, which also defines the payment scheme.

2.2.6.7 Contacts

For more information regarding ISS commercialisation activities, please contact the Commercial Promotion Office via any of the coordinates given below. To initiate a commercial project with ESA the customer should submit a Commercial Proposal by registered mail to the same address:

Commercial Promotion Office (HME-EC)
Directorate of Human Spaceflight, Microgravity and Exploration Programmes
European Space Agency
Keplerlaan 1
2201 AZ Noordwijk
The Netherlands
Tel: +31 71 565 5068
Fax: +31 71 565 5232
E-mail: issbusiness@esa.int

Or visit the following web site: http://www.esa.int/issbusiness

2.2.7 Student Access

2.2.7.1 International Space Station

"Space station Utilisation Contest Calls for European Student initiativeS – SUCCESS" is a competition for European university students (up to Masters level or equivalent) from all disciplines to propose an experiment that could fly onboard the ISS. The goal of the competition is to create the interest in today's students for life and physical sciences. The first prize of the competition is a one-year internship at ESA's Space Research and Technology Centre in Noordwijk, the Netherlands. During this one-year period the student can implement his/her experiment with the possibility of qualifying it for flight on the ISS.
For the current status and further information please visit the Education website at the following address:
www.esa.int/esaHS/SEMU9TGHZTD_education_2.html

2.2.7.2 Parabolic Flights

In the framework of ESA's educational activities, ESA organises, on average once per year, parabolic flight campaigns for students. Approximately 30 experiments are selected to fly during each campaign, with each experiment being designed and developed by teams of 4 students. Each experiment flies twice, accompanied each time by 2 different students, giving each student a flight opportunity. In most cases, the best 2 experiments of each campaign are subsequently selected for reflight, together with the student team, on one of the ESA Microgravity Research campaigns. ESA funding for the selected experiments covers the costs of the flight opportunity, the accommodation and the travel expenses between the accommodation and the flight campaign airport. Funding to cover all other costs, including design and development of hardware, must be covered by the Universities involved, or by the national agencies and other institutes. Students should refer to the following ESA Student Parabolic Flight Campaign website for more information on upcoming student campaigns:

http://www.estec.esa.nl/outreach/parabolic/index.html

The student campaigns are ONLY open to:

- Undergraduate students attending a university in one of the ESA member states;
- Students who are between the ages of 18 and 27 at the start of the campaign;
- Students who have not taken part in previous student campaigns.

The student application process involves 3 main phases:

2.2.7.2.1 Phase 1

Each of the 4 team members must fill out a form on the ESA Student Parabolic Flight Campaign website submitting the following details:

- Name;
- Address;
- Date of birth;
- Nationality;
- Telephone number;
- Fax number;
- E-mail address;
- A paragraph outlining the motivation for participating in the parabolic flight campaign.

At this point the students should find a professor within their university to endorse their application, and they should nominate one of the team members to act as a representative. Once this has been done, Phase 2 can be initiated.

2.2.7.2.2 Phase 2

This phase involves filling out one form per team on the above-mentioned ESA website. The following information is submitted:

- Name of endorsing professor;
- E-mail address of endorsing professor;
- Team/experiment name;
- Name of group representative.

The group representative will be the main point of contact between the Education Office and the team. Successful completion of phase 2 will depend upon the endorsing professor confirming his/her support. After completion of phase 2, a team password and registration number will be sent to the group representative. These will allow the students to access a non-public area of the ESA website to be able to retrieve the forms necessary to complete the next phase.

2.2.7.2.3 Phase 3

The student teams must download and complete an experiment form from the ESA website, providing the following:

- Title of the experiment and Team name;
- Experiment objectives;
- Experiment description;
- Technical description of the experiment set-up;
- Dimensions and maximum mass of the experiment;
- Number of racks required;
- Electrical requirements;
- Details on how the equipment will be fixed;
- In-flight procedures;
- Hazard analysis: consists of answering a series of questions;
- Details about pressure vessels used (if any);
- Vent line connection and other requests;
- Description of Outreach Programme (see below);
- Contact details of all team members;
- Details of endorsing professor.

The experiment form must be submitted to ESA, by e-mail or fax, before the published deadline.

2.2.7.2.4 Outreach Programme

It is mandatory for teams who are eventually short-listed, to carry out and provide proof of, outreach activities that are to be organised both before, and after the campaign. These activities can be any of the following:

- A presentation to a local school or club;
- A newspaper article in a local newspaper;
- A news item transmitted on a local radio or TV station;
- The creation of a web page.

2.2.7.2.5 Contacts

For those students conducting experiments using human subjects, proof must be submitted that the requirements stated by French law are satisfied. For those students using animals as subjects, it is important that your University approve of your experiment from an ethical point of view.

For further information please use the following contact details:

Fax: +31 71 565 5590
E-mail: spfc@esa.int

2.2.7.3 Other Platforms

Occasionally ESA offers the possibility to perform research on facilities other than the ISS to students (i.e. drop tower, sounding rockets and Foton), through participation in the SUCCESS Special Opportunities via the SUCCESS student contest.
For the current status and further information please visit the Education website at the following address:
www.esa.int/esaHS/SEM2V0NKPZD_education_2.html

2.3 Complementary Access Routes

2.3.1 Drop Towers

2.3.1.1 Funding Via National Agencies

Researchers can also obtain funding from their national agencies. This can either be a full funding covering the use of the drop tower, the experiment hardware development, the related lab activities, the travel costs and accommodation, or it can be a partial funding together with the European Space Agency – ESA (see section 2.2). In the latter case, ESA will provide users with access to the drop tower for utilisation, while the national agency (or user's institute) covers the costs related to hardware development, testing and other lab activities. For this type of access researchers should contact their respective national agencies.

2.3.1.2 ZARM Funding

The ZARM Drop Tower Operation and Service Company mbH (ZARM-FAB) offers up to 10 drop tower experiments per year free of charge to researchers from universities and industry.

2.3.1.2.1 Conditions

To request funding directly from ZARM, all of the following conditions must be satisfied:

- No funding for drop tower use from other sources;
- The experiment requires no more than 9.4 seconds of reduced gravity ($<10^{-5}$ g);
- The experiment can be performed in agreement with the guidelines laid out in this document;
- The experimental hardware core already exists or will be provided by the experimenter;
- The applicant must cover travel and accommodation expenses.

2.3.1.2.2 Support and Services

If the experiment proposal is accepted, ZARM-FAB will provide the following support and services:

- Engineering support for design and adaptation of experimental hardware;
- Technical support concerning functionality and safety;
- 1 drop capsule - standard platform;
- Integration of the experiment into the drop capsule;
- Access to standard equipment (i.e. video cameras, video recorders, capsule computer system CCS, etc.);
- Access to laboratory;
- Up to 10 drops;

- Support to publication of results.

2.3.1.2.3 Applications

The application package must include:

a. A description of the experiment, with the emphasis on:

- A clear explanation of the objectives;
- The scientific relevance;
- The microgravity relevance;
- The probability of collecting quantitative results;
- The qualification and experience of the applicant;
- The compatibility of the relevant time constants with the conditions offered by the drop tower.

b. A sketch or technical drawing of the set-up

2.3.1.3 Co-Funding Through DLR

The main customer of ZARM-FAB mbH is the German Aerospace Centre (DLR), which is also the German national space agency. For this reason, cooperative projects with German research institutes and/or scientific groups could lead to co-funding via the DLR. For more information users should contact ZARM (see section 2.2.2.2 for contact coordinates).

2.3.2 Parabolic Flights

2.3.2.1 Funding Via National Agencies

In theory, national agencies can sponsor parabolic flight campaigns on their own and researchers can therefore access parabolic flights via these campaigns. In practice, though, only the German (DLR) and French (CNES) National Space Agencies sponsor, at a European level, perform their own parabolic flight campaigns. In general, access is obtained via the European Space Agency (ESA) – (refer to section 2.2). However, when proposals are submitted to, and accepted by ESA, the latter will only provide the user with a "flight ticket" for a parabolic flight campaign. All other costs related to hardware development, testing, lab activities, travel, subsistence etc., must be covered by the user's national agency, or their affiliations/institutes. Users are advised to contact their respective national agencies for further details.

2.3.3 Sounding Rockets

2.3.3.1 Funding Via National Agencies

The German and Swedish Space Agencies have in the past been the only National Agencies in Europe that have funded their own sounding rocket campaigns or their own payloads. Therefore, researchers of German or Swedish nationality can try to gain access to sounding rocket missions for their experiments via their national agencies.