Instructions, guidelines and conditions for the 'Fly Your Satellite!' (FYS) proposals submittal

General information:

All proposals will be reviewed by a specifically appointed ESA CubeSat Evaluation Board, whose decisions will be final.
The selection criteria will include, amongst others:
- the educational content and the project objectives,
- the technical maturity of the proposed satellite, and its compatibility with the "Fly Your Satellite!" schedule and milestones
- the team background.

The proposals should not exceed, as a guideline, **30 pages.**
While this is not a firm limit, concise proposals are encouraged; if needed, more detailed data can be provided in annexes to the proposal, as support information.

The cover page of the proposal shall include:
- Title: FYS – CubeSat Proposal - *(Name of the CubeSat)*
- Name, city, country of the proposing university/institute
- Name, address, telephone number and email address of the Team Leader.

Scope of the CubeSat:

The primary scope of the proposed CubeSat mission shall be educational, and the proposal shall clarify in which way the educational objectives will be pursued.
The proposal shall also highlight any additional complementary goals of the CubeSat mission (for instance science, technology, outreach, or other).

Proposal Submittal:

The proposal shall be based on the 'Proposal's Table of Contents' provided below, and it shall be submitted by the Team Leader.
The proposal shall be sent in one PDF file to cubesats@esa.int no later than **1 Mar 2013.**
The file name should be in the format: 'FYS – CubeSat Proposal - *(Name of the CubeSat)*'.
ESA will acknowledge the receipt of all proposals received at the specified email address.

University Teams:

The ideal applicants shall be University Teams, that shall include at least:
- A Team Leader (a professor of the university that proposes the CubeSat, and who shall work on the proposed CubeSat project with the official endorsement of his university)
- A System Engineer (a PhD or MSc student from the same university as the Team Leader)
- An initial group of at least 4 additional Team Members (Student Team Members, when the applicants are University Teams), whose number may be extended during the project lifetime.

There will be no limit to the maximum number of Student Team Members.

Eligibility Criteria for students' sponsorships

The students who may directly benefit from the different forms of sponsorship and training opportunities that the ESA Education Office will offer shall hold the nationality of an ESA Member or a Cooperating State, and shall be enrolled as students at their university, at any level of their university studies: BSc, MSc, or PhD.
The University Teams are not forbidden to include students that do not meet the eligibility criteria, but these students cannot be sponsored by the ESA Education Office (for example, to travelor to participate in workshops, etc.).
ESA may ask the University Teams to provide evidence of their compliance to the eligibility criteria at any time during the project.

CubeSats ranking and selection:

Decisions implying the definition of rankings and selections of CubeSat teams will be taken by a dedicated ESA CubeSat Evaluation Board composed of ESA experts.
Rankings and selections will not apply only to the process of the proposals selection, but also to select the project teams admitted from one phase to the next.
By submitting their proposals, the applicants accept not to challenge nor to appeal against the decisions taken by the ESA CubeSat Evaluation Board.

CubeSat description:

The proposed CubeSat shall comply with the CubeSat Design Specification (CDS) rev.12 (http://www.cubesat.org/images/developers/cds_rev12.pdf).
The proposal shall include information on at least the following topics:

- Scope of the satellite project : the primary scope shall be educational, but also the complementary scopes (science, technology, or other) and the description of the mission shall be indicated.
- Overall envelope characteristics: size (1U, 2U, or 3U) in stowed configuration, configuration/size/dimensions in orbit, mass budget, power budget, communications budget
- Usage of deployable devices (antennas, solar panels, booms, drag augmenting devices, other).
- A concise overall design concept of the CubeSat shall be provided, explaining which parts were procured from commercial suppliers, and which parts were developed by the university team.
- The proposed assembly integration, testing, and verification approach for subsystem/equipment, and at the level of the integrated system (development, qualification or proto-qualification, acceptance), indicating which tests are meant to be performed in laboratory environment conditions, and which tests are meant to be performed in thermal-vacuum or in other special environmental conditions.
- Planning.

Proposal's Table of Contents

In the light of the above guidelines, the Table of Contents of the proposal shall include the following:

1. Objectives of the project

Explain the objective(s) of the satellite project.

The primary scope of the satellite project shall be educational; clarify in which way the educational objectives will be achieved.

Explain whether the project has additional objectives (science, technology, outreach, other), and clarify the way in which they are meant to be achieved.

2. Mission Description

Provide a summary description of the satellite mission. Include the mission profile and duration.

Indicate the preferred orbit (if any).

Assess whether launching the satellite to a different orbit would degrade the mission's success, and any possibilities of adapting the satellite operations for different orbits (remember that the launch opportunity is not yet available, and the exact orbital parameters are not known yet).

3. System Description

Provide a technical description of the CubeSat system, for:

- flight segment
- ground segment, including the ground station(s) intended to be used
- ground support equipment needed to support the development, testing, and the mission operations.

The technical description shall include the indication of the satellite parts specifically developed by the proposing team, and the identification of the items procured off-the-shelf, their suppliers, and the flight heritage of the items procured off-the-shelf.

The system description shall include at least:

3.1. CubeSat FM design description

3.1.1 Spacecraft System Configuration

Describe the envelope size (1U, 2U, or 3U) in stowed configuration at launch; configuration/dimensions in orbit; usage of deployable devices (antennas, solar panels, booms, drag augmenting devices, other)

3.1.1 Attitude Determination and Control Subsystem (ADCS)

3.1.2 Electrical Power Subsystem (EPS)

3.1.3 On-board Data Handling (OBDH) and Software

3.1.4 Telemetry, Tracking and Communications (TT&C) subsystem

3.1.5 Structure

3.1.6 Thermal control

3.1.7 Budgets

3.1.7.1 Mass

3.1.7.2 Power

3.1.7.3 Link budget, data rate

3.1.8. Payload description and required resources

3.2 Ground Segment

3.3 Ground Support Equipment

3.4 Operations

Describe the specific requirements for the ground processing/storage, the pre-launch operations including final checkout and battery recharging operations, early in-orbit operations, description and duration of commissioning, method to achieve attitude stabilisation after launch, in-orbit operations including operational modes, housekeeping parameters.

4. Assembly Integration and Testing / Verification

Describe the Assembly Integration and Testing approach and the model philosophy: does the team plan to develop an Engineering Model, Qualification Model, Protoflight Model, Flight Model, and/or other type of model of the satellite or of some of its subassemblies (possibly built for test purposes).

Describe the intended qualification approach, the test plan, and the envisaged test facilities.

5. Project Status and Programmatics

Describe the level of development/procurement/readiness of all the satellite system and of the models, which were described in sections 3 and 4.

Provide the scope and expected date of availability of non-flight models (if any).

Provide the cost breakdown of the project; indicate who are the funding organisations (sponsors), and whether the development funding is completely guaranteed, or whether it is (in part?) uncertain.

6. Project Team

Define the organisation of the project team, with clear identification of the functions and people.

Identify the team leader (normally a university professor), and submit a letter from a senior representative of the University to confirm officially that the University supports his appointment to lead the CubeSat project. In the annexes of the proposal include a concise CV of the Team Leader.

List the other key people.

All key people shall be identified by reporting their full name, function in the programme, and contact information (e.g. full address, email, office phone number, mobile phone number).

7. Background of the proposing organisation

The proposing organisation shall report concisely their experience in building educational satellites, or in running other sorts of educational space hands-on projects. They should also clarify their motivations for embarking on the project.

8. Undertakings

The proposal shall confirm the commitment of the team, if selected, to prepare and to make available to ESA for review their satellite design documentation, including:

- Their Mission requirements and their CubeSat design specification
- Design Description
- Engineering Analyses (to support the design definition, and also in preparation and in support of the test campaigns)
- Operations Description
- Test procedures
- Test reports
- Verification Control Document
- Any other document requested to be part of the Acceptance Data Package (including safety documentation, and declared materials list), and all inputs that will be requested by the launch authority
- Analysis to assess the satellite compliance to the ESA space debris mitigation requirements ESA/ADMIN/IPOL(2008)2.
- Registration of the satellite frequencies with IARU and ITU
- Registration of the satellite with UNOOSA, at the United Nations Register of Objects Launched into Outer Space
- Composition of the project team (including periodic reporting of the changes). The list shall report the total number of Student Team Members, and shall indicate their names, nationality, and level of studies.
- Concise periodic progress status reports during the satellite development and test phase
- Periodic synthetic Operations Status Reports (after launch, if selected for Ticket to Orbit)
- Lessons learned file

The CubeSat Teams participating in the program shall support project meetings and reviews with ESA, to be held either at their team premises, or at ESA establishments.

On the occasion of meetings/reviews to be held at ESA establishments, ESA will sponsor the travels of a few students eligible for ESA sponsorship.