Training Opportunity for Spanish Trainees

Reference	Specialist Area	Duty Station
ST-2010-EOP-SA(2)	**Training activities in Earth Observation (2)**	**ESRIN**

Overview of the Division missions:

Support the development of the Earth Observation Program strategy, coordinate all science and preparatory studies, management of the Earth Explorer mission selection, contribution to the management of requirements for future Earth Observation missions, coordination of the education and training activities of the department, including Eduspace, and organization of training courses worldwide.

Overview of the field of activity proposed:

Contribution to the development of training projects and tutorials in the area of Earth Observation
In particular, the candidate will improve and complete the design and implementation of a training module on SAR Polarimetric and Interferometric data processing and applications, based on the ESA Toolboxes NEST and PolSARPRO, at University level.

The work will include:

- Review of relevant literature and of the latest conference proceedings (including Fringe workshops)
- Review of the existing NEST and PolSARPRO tutorials
- Review of main relevant results published on ESA EOPI page and by ESA PI's
- Contribution (by means of lectures, creation of exercises and support to lab activities) to ESA training courses on these subjects, taking place in ESRIN and worldwide
- Preparation of relevant exercises for the ESA EO Education web page
- Contribution to the improvement/extension of NEST and PolSARPRO tutorials
- Contribution to related conferences and workshops organized by ESA or where ESA is participating

Required Education:

Languages: fluency in English is required. A 4 or 5-years university degree in Engineering or Physics with a good background in Radar Remote Sensing is required.
Familiarity with image processing SW packages like ERDAS Imaging, ENVI (or similar) and GIS are required.
Desirable: familiarity with ESA and TPM data (ENVISAT ASAR, ALOS PalSAR etc.) as well as with data access and catalogues for such EO missions; familiarity with ESA Toolboxes.

Training Opportunity for Spanish Trainees

Reference	Specialist Area	Duty Station
ST-2010-TEC-SY(1)	**Systems Engineering (1)**	**ESTEC**

Overview of the Division missions:

The Systems and Cost Engineering provides support to projects in the domains of systems engineering, cost engineering, concurrent engineering. It also develops small satellites for in-orbit demonstration (IOD) and special objectives. One of such IOD is Proba-V. Proba-V is a small satellite that carries a multi-spectral medium reosultion sensor that provides continuity to the data provided so far by the Vegetation sensor aboard Spot-4 and Spot-5. The Division develops the Proba-V mission end-to-end, space, ground and user segment, platform and payload.

Overview of the field of activity proposed:

The selected candidate will be integrated in the Division and allocated mainly to the Proba-V project. This should allow the candidate to obtain a total view of an Earth Observation project, its elements, technology challenges, the complete project lifecycle.

Required Education:

Engineering degree, knowledge of space systems with interest for EO and in particular optical payloads.

Training Opportunity for Spanish Trainees

Reference	Specialist Area	Duty Station
ST-2010-TEC-SY(2)	**Systems Engineering (2)**	**ESTEC**

Overview of the Division missions:

The Systems and Cost Engineering provides support to projects in the domains of systems engineering, cost engineering, concurrent engineering. It also develops small satellites for in-orbit demonstration (IOD) and special objectives. One of such IOD is Proba-3. In Proba-3 two satellites fly in tight formation to form a giant sun coronograph. Formation flying is an enabling technology for demanding future missions, especially in the Space Science domain. Coronography is a technique postulated for advanced scientific applications. In Proba-3 the Division implements the project end-to-end, all mission elements, space – ground and user segments.

Overview of the field of activity proposed:

The selected candidate will be integrated in the Division and allocated mainly to the Proba-3 project. This should allow the candidate to obtain a total view of science and technology demonstration projects, its elements, technology challenges, the complete project lifecycle. The incumbent will also work in concurrent engineering in most advance concurrent design facility.

Required Education:

Engineering degree, knowledge of space systems with interest for Space Science and preferably good background on control systems.

Training Opportunity for Spanish Trainees

Reference	Specialist Area	Duty Station
ST-2010-SRE-SM(2)	Scientific use of Venus Express housekeeping data	ESTEC

Overview of the Division missions:

The Planetary Science Division is responsible for all scientific aspects of all solar system missions of ESA. The mission of concern for this particular study is primarily Venus Express, Mars Express and Rosetta.

Overview of the field of activity proposed:

The Venus Express mission will now enter a new phase, with a reduction of its pericenter altitude, where the atmospheric drag starts to play a significant role, well below 180 km. By measuring the atmospheric drag several important parameters of the atmosphere can be derived.
It is proposed to study the scientific use of Venus Express housekeeping data (i.e. satellite/engineering data), in particular data from the on board accelerometers like gyroscopes, solar panel orientation, and reaction wheels.
The aim is to build a data pipeline and to determine, from this data set, a first preliminary set of parameters such as density, wind and temperature.
An independent and complementary way of measuring these parameter is to use tracking data from the ground stations in use. This is done in collaboration with an institute in Brussels. If time allows also a comparison of the results from these two independent measurements should be carried out.
This work will help preparing the Venus Express aerobraking phase, which is foreseen for 2012.
Similar work could be carried out as well for Mars Express, equipped with similar instrumentation. The Mars Express pericenter is located at much higher altitudes, but it is possible that Mars' atmosphere could be studied in the same way.

Required Education:

MSc or similar in one of the following fields:
Aerospace, Electrical eng, mech eng., physics, planetary science or similar.

Training Opportunity for Spanish Trainees

Reference	Specialist Area	Duty Station
ST-2010-TEC-SYE	Space Mission Design	ESTEC

Overview of the Division missions:

Within the European Space Agency, the main activities in the Concurrent Design Facility (CDF) at ESTEC are feasibility studies and assessment of future missions, conceptual design of instruments and payloads, review of initial design and training in system engineering. Internal pre-Phase A, mission and system design studies are managed and executed using the CDF with the participation of ad-hoc interdisciplinary teams.

These objectives are achieved by means of practical application of concurrent engineering methods and tools. The Division is also responsible for the development and maintenance of the related hardware and software infrastructure.

Further up-to-date information on our latest projects is available at http://www.esa.int/CDF

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Overview of the field of activity proposed:

Hands on experience on spacecraft and space mission design, using Concurrent Engineering approach, is the field of application proposed for this training.

The trainee will have the opportunity to participate to a complete design cycle including all aspects of a space mission design starting with the definition of the mission requirements, working in a team of specialists in support of the System Engineer.

The activities in CDF are performed in close cooperation and interaction with space scientists and technical specialists covering all disciplines of the space and ground segments, as well as programmatic aspects, cost estimate and technical risk assessment.

The trainee is also expected to devote part of the training to the analysis, definition and enhancement of the software infrastructure, spacecraft system and subsystem models and databases used by the Concurrent Design Facility.

Required Education:

Applicants should have completed a University course at Masters level in a technical or scientific discipline (engineering, physics, informatics) and a good background and interest in spacecraft and mission design. Candidates must be fluent in English or French, the official languages of the Agency.

In addition a good knowledge of system analysis and design tools (e.g. Matlab, STK, CATIA, Eurosim, etc.) as well as good practice in office automation tools (e.g. Excel, Word, PowerPoint, databases) is required.

A natural aptitude to teamwork is a necessary asset.