

VACANCY NOTICE FOR A TRAINEESHIP

AREA OF ACTIVITY	REMOTE HANDLING – IVVS (PROGRAMME A)
REFERENCE	F4E/TRA/2016/022
START AND END DATE - DURATION	01/10/2016 – 30/06/2017 - 9 MONTHS
LOCATION	BARCELONA (SPAIN)
PUBLICATION DATE	02/05/2016
CLOSING DATE FOR APPLICATIONS	31/05/2016 AT 12:00 PM (BARCELONA TIME)

1. DESCRIPTION OF THE DEPARTMENT/PROJECT UNIT

The RH Project Team is responsible of the procurement of several Remote Handling systems which are used for the maintenance of ITER, in particular of the following packages:

- Divertor Remote Handling System (DRHS)
- Cask and Plug Remote Handling System (CPRHS)
- Neutral Beam Remote Handling System (NBRHS)
- In-Vessel Viewing System (IVVS)

2. DESCRIPTION OF TASKS

The In-Vessel Viewing System (IVVS) is a remote handling system which uses a laser-based scanning head to take both 2D and 3D images of the inside of the Tokamak. The IVVS is a key tool for identifying damage and erosion of first wall components that can occur after loss of control of the plasma inside the vessel.

The quality of the IVVS imaging is dependent on a wide range of parameters, with an optimum configuration (position, scan speed etc.) that changes for each component in the ITER Vacuum Vessel. Through previous work, a simulator has been developed to investigate the viewing quality for different zones of the ITER vessel, and a basic IVVS prototype has been constructed to test key elements of the proposed design.

The main goal of this studentship will be to develop a model to investigate the effects of IVVS parameters on the viewing quality.

The basic function of the model is to perform raytracing from the IVVS probe to meshed models of the In-Vessel components. The intersection between the rays and the large polygon meshes is calculated, including effects of obscuration and the use of hierarchical trees to reduce computation time. Real models of surface reflectivity are used to generate the reflected signal, and optical modelling is required to calculate the actual signal collected by the probe (viewing and metrology).

The role of the student will be to add functionality to the model in some of the following areas:

- Simulation of viewing images of in-vessel components;
- Analysis of scanning strategies (probe position, sample density);
- Multiple reflections (perhaps using radiosity);
- Analysis of scanning strategy (effects of scan speed, path);
- Analysis of thermal/vibration effects in time during scan;

The student will be expected to take an active role in work with the IO, F4E and the IVVS industrial supplier in order to better define the operational missions and needs of the IVVS.

3. ELIGIBILITY CONDITIONS

- Be a national of one of the Member States of the European Union or of a Third state fully associated with the Euratom fusion programme (Switzerland);
- The candidate must have finished his/her university degree at least 3 years attested by a diploma. The university degree must have been obtained within the last 3 years before the closing date for applications;
- In order for the trainee to fully profit from the traineeship and to be able to follow meetings and perform adequately, candidates must have good knowledge of English, the main working language of F4E.

Applications will not be accepted from candidates who:

- have already benefited from any kind of in-service training within a European institution or body, or
- who have had or have any kind of employment within a European institution or body.

4. QUALIFICATIONS REQUIRED

Essential:

- Degree or Master degree in Engineering/Physics/Computer science/optics/
- Experience in Programming, including basic computer graphics with polygon objects

Advantageous experience:

- Optical simulations
- Matlab
- Management and Visualisation of large data sets

5. WHAT WE OFFER

Trainees are awarded a monthly maintenance allowance. The monthly allowance for 2016 amounts to €1087,39.

Additionally, trainees may receive a travel allowance, subject to budget availability, to compensate for travel expenses incurred from the place of residence to the seat of F4E and vice versa. Trainees whose place of recruitment is less than 50 km from F4E's offices shall not be entitled to a travel allowance.

Detailed information about the F4E traineeship procedure as well as trainees' rights and duties can be found in the Decision of the Director of 'Fusion for Energy' on the Acceptance of Traineeships published on our website. We strongly recommend applicants to read them carefully.

Accommodation costs will be covered by the trainee.

6. SUBMISSION OF APPLICATIONS

The online application process starts upon clicking "**CLICK TO APPLY**" on the traineeships page: <http://www.fusionforenergy.europa.eu/careers/traineeships.aspx>.

Applicants must register their applications online through the F4E traineeship's tool by creating a valid F4E user account and choosing the vacancy notice they wish to apply to.

Please note that the online traineeship application tool is the *only* acceptable means of sending applications. Applicants are responsible for keeping their e-mail addresses and personal details up to date in their profile in F4E online application tool.

The mandatory fields in the profile marked with an asterisk should be duly filled in. Candidates are requested to submit the following 2 documents:

- A detailed Europass curriculum vitae in **English** (can be obtained at the following address: <http://europass.cedefop.europa.eu/en/documents/curriculum-vitae>)
- A motivation letter of 2 pages maximum in English

Applications must be sent by 31/05/2016 (closing time 12:00 pm Barcelona time).

In case you encounter technical problems when trying to submit your application via the traineeship application tool, please make a screenshot and send it to: traineeships@f4e.europa.eu.

It is the responsibility of the applicant to inform 'Fusion for Energy' about any technical problem without delay within the deadline mentioned above.

Please, do not send any supporting documents (i.e.: copies of your ID-card, educational certificates, etc.) **with your application at this stage if not specified in the Traineeships Notice.**