

## VACANCY NOTICE FOR A TRAINEESHIP

<b>AREA OF ACTIVITY</b>	<b>THERMO-HYDRAULIC ANALYSIS OF HIGH HEAT FLUX COMPONENTS</b>
<b>REFERENCE</b>	<b>F4E/TRA/2017/035</b>
<b>START AND END DATE - DURATION</b>	<b>01/10/2017 - 30/06/2018 - 9 MONTHS</b>
<b>LOCATION</b>	<b>BARCELONA SPAIN</b>
<b>PUBLICATION DATE</b>	<b>28/03/2017</b>
<b>CLOSING DATE FOR APPLICATIONS</b>	<b>26/04/2017 AT 12:00 PM (BARCELONA TIME)</b>

### 1. DESCRIPTION OF THE DEPARTMENT/PROJECT UNIT

The Neutral Beam (NB) and Electron Cyclotron (EC) Power Supplies and Sources (gyrotrons) Project Team prepares and manages the procurement of the Neutral Beam Injectors and the EC Power Supplies and Sources (gyrotrons) to be provided to ITER IO as EU in-kind contributions, and supports the IO in related activities as necessary. The scope includes the preparation and operation of prototypes in dedicated test facilities.

In particular, the Project Team is responsible for the delivery:

- NB Beam Sources, Two Ion Sources and one Accelerator to produce negative ion beams, in D and H, at energies up to 1 MeV;
- NB Beam Line Components; two Neutralisers, two Residual Ion Dumps and two Calorimeters;
- NB Confinement and Shielding: two vessels, one passive magnetic shielding and valves;
- Two sets of NB Active Correction and Compensating Coils;
- NB Assembly for the two ITER injectors;
- NB Power Supplies;
- A set of gyrotrons for a cumulative power of 6 MW;
- EC power supplies comprising eight Units each composed of one Main High Voltage Power Supply and two Body Power Supplies.

### 2. DESCRIPTION OF TASKS

In the ITER tokamak several components are subject to heat removal issues spanning from the low-temperature (and low flux) range - in the superconducting magnets and related current leads - to the high temperature and high heat flux range - in the blanket and the divertor, but also in components like the gyrotron, with its the resonance cavity and collector. The different

aggregation phases (gaseous, liquid or mixture of the two) make many of the heat removal problems challenging for engineers.

The trainee will be required to carry out the following tasks:

- Support to Computational Fluid Dynamics (CFD) analyses of ITER systems under F4E responsibilities (e.g. Vacuum Vessel)
- Benchmarking of the ANSYS CFD model used for the Vacuum Vessel simulations with STARCCM+
- Sensitivity analysis of the CFD models
- Optimisation of the gyrotron cavity cooling design
- Calibration of the 3D CFD model of the gyrotron cavity and prediction of performances

### **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**

- University degree in engineering with relevant education in thermo-hydraulic (nuclear engineering, mechanical engineering or equivalent).
- Good communication skills and ability to work with others
- Good analytical and problem solving skills

### **5. ADVANTAGEOUS QUALIFICATIONS**

- Previous experience with software for analysis and modeling in fluid dynamics - CFD (Computational Fluid Dynamic), would be very advisable, preferably with STARCCM+.

## 6. WHAT WE OFFER

Trainees are awarded a monthly maintenance allowance. The monthly allowance for 2017 amounts to €1.087,39.

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 26/04/2017 (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](mailto: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.**