## Job Title: Scientist (Disruptions and Physics Operations) IO0298

Requisition ID **7820** - Posted - (France, 13067 St Paul Lez Durance Cedex) - **Science and Technology Expertise** - **New Posting**

Fusion, the nuclear reaction that powers the sun and the stars, is a promising long-term option for a sustainable, non-carbon emitting global energy supply.

The ITER Organization (IO), based in the southern France, welcomes best talents who can together prepare the way to this new energy in a truly multi-cultural work environment.

We offer challenging assignments in a wide range of areas and encourage applications from candidates will all levels of experience. Applications from under-represented ITER Members' nations and women candidates are strongly encouraged, as IO strongly believes that a diversified, equitable, and inclusive workplace is crucial in solving one of the most complex scientific and engineering projects in the world today.

As the IO attracts and retains people coming from a vast array of different backgrounds and cultures, discrimination and exclusion cannot be tolerated. The IO believes it is our diverse perspectives and background that gives unique strength and value to the ITER mission, regardless of race, member nation, gender, religion, status, sexual orientation, or disability - all are welcome and respected at ITER.

ITER CARE Values (Collaboration / Accountability / Respect / Excellence):
We perform our work with care, we care for the well-being of colleagues, our families and ourselves, and we care about the health of the planet for generations to come. CARE drives our work and our behaviors at ITER.

To see why ITER is a great place to work, please look at this video

**Application Deadline:** 31/03/2025
**Department:** Science & Integration Department
**Division / Program:** Science Division
**Section / Project**: Experiments & Plasma Operation Section
**Group**: Not applicable
**Job Grade:** P2/P3
**Language Requirements:** Fluent in English (written & spoken)
**Contract Duration:** Up to 5 years

### Overview

Are you looking for an exciting opportunity at the heart of an ambitious fusion energy project? Join us as a **Scientist in the area of Disruptions and Experimental Plasma Physics** where you will:

- Make a strong contribution to the development of the operational basis for disruption avoidance/mitigation on ITER within the ITER Research Plan.
- Contribute to the study of the consequences for the ITER machine of disruptions, both mitigated and unmitigated.
- Play an important role in the definition of experimental plans and preparations for ITER's scientific exploitation.

*The Experiments & Plasma Operation Section has for primary scope, the delivery of the ITER Plasma Control System, definition of the physics basis for and support to the technology development of the Disruption Mitigation System, preparation for plasma operation and the provision of a rapid Pulse Design Simulator for plasma scenario development. It also supports the Project in terms of physics consultation across all areas of component design and expected operational performance as well as being the key*

*interface between the ITER Organization and the ITER Members' fusion communities for all matters related to ITER's experimental exploitation.*

## Key Duties and Responsibilities

### Primary Responsibilities

- Plays a key role in the development of the basis/strategy for disruption avoidance/mitigation on ITER, including the interface with the ITER Plasma Control and Advanced Protection Systems and the development of relevant modules for the ITER Pulse Design Simulator.
- Promotes experimental and modelling activities within the Members' fusion communities concerning the further refinement of the ITER disruption Mitigation System physics basis.
- Integrates R&D results and analysis from the ITER Members' programs, particularly in the areas of magnetohydrodynamic (MHD) stability and plasma control and evaluates the implications for ITER plasma operation scenarios and the performance of in-vessel components.
- Contributes to the preparation and implementation of the disruption load validation program and participates in the development of the DMS commissioning plan.
- Makes a strong contribution to the definition of experimental plans and preparations for ITER's scientific exploitation, developing expertise with ITER plasma scenario and pulse design, and assisting with the activities to prepare for and execute experiments at ITER.

### Additional Responsibilities

- Liaises effectively with ITER construction activities in areas related to MHD instability control systems, particularly avoidance, control and mitigation techniques for disruptions and VDEs, and in relation to the specification of disruption/Vertical Displacement Event (VDE) impacts on vessel and in-vessel components.
- Participates in the definition, development and documentation of tools needed to prepare, validate and program ITER plasma discharges.
- Participates in the development of operation scenario designs consistent with the ITER Research Plan requirements and in the definition of training plans to support ITER scientific exploitation.
- Supports team activities efficiently in the relevant area of the ITER Project, specifically on the further refinement of the new baseline ITER Research Plan, particularly in the areas of disruption mitigation and plasma scenario design.
- Collaborates across IO and with external stakeholders and networks (e.g. ITPA, ISFN) to exchange and/or confirm information, particularly in the areas of physics operations, MHD stability, and the control/avoidance of MHD instabilities, in particular disruptions and VDEs.
- Supervises when required ITER staff/visiting and postdoctoral researchers/PhD students/ interns contributing to studies in areas of ITER physics related to MHD instabilities and their avoidance, control and mitigation.

**Please note that job descriptions cannot be exhaustive, and the staff member may be required to undertake other duties, which are broadly in line with the above primary responsibilities.**

## Experience & Competencies

### Essential:

- **Proven experience** in experimental fusion science and plasma physics**,** including in the field of plasma disruptions and disruption mitigation.
- Knowledge/experience of the key elements of plasma pulse scenario design.
- Experience in planning, execution and analysis of results from fusion experiments.

### Desirable:

- Experience in the physics operation of magnetic confinement devices.
- Codes and analysis tools addressing experimental aspects of tokamak plasmas, especially of disruptions (stability analysis tools, 1-D or 2-D reconstruction tools for profiles of plasma parameters, material heat impact codes, field line tracing codes, etc.).
- Programming languages commonly used in fusion plasma simulation applications and workflow management (e.g. Fortran, Python, C/C++).

- Working knowledge of the ITER Integrated Modelling Analysis Suite (IMAS).
- Experience in managing scientific and/or technology R&D within an international environment.
- Knowledge/experience of the key elements of tokamak plasma control.

**Qualifications**

**Essential:**

- Master's degree or higher (PhD) or equivalent in fusion plasma physics or other relevant discipline.
- *The required education degree(s) may be substituted by extensive professional experience involving similar work responsibilities and/or additional training certificates in relevant domains.*

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***The following items apply to all jobs and job holders for the duration of tenure at ITER Organization:***

- **The CARE Values are a framework of principles that guide our actions and define the culture and spirit of the ITER Project:**

**Collaboration:** We collaborate with commitment and flexibility using the power of teamwork, building partnerships, and working with others to reach shared objectives;

**Accountability:** We are accountable for the whole project - we take responsibility for our specific actions and are transparent in our daily work, holding self (ourselves) and others accountable to meet commitments;

**Respect:** We treat each other with respect and dignity at all times, knowing that all of us belong here. We appreciate the value that our multicultural and diverse community brings to the ITER Project;

**Excellence**: We are driven by excellence; we are agile and innovative while maintaining the highest standards of safety, quality and integrity;

- **ITER Core Technical Competencies**:
  1) **Nuclear Safety, Environment, Radioprotection and Pressured Equipment**
  2) **Occupational Health, Safety & Security**
  3) **Quality Control & Quality Assurance Processes**
- **Knowledge of these competencies may be acquired through on-board training at basic understanding level for all ITER staff members;**
- Implements the technical control of the Protection Important Activities, as well as their propagation to the entire supply chain;
- May be requested to perform other duties in support of the project as defined by your line manager, and when relevant upon the request of the matrix manager;
- May be requested to work outside the ITER Organization reference working hours, including nights, weekends and public holidays, due to business needs - this may include on-call, shift work, etc.
- May be requested to be part of any of the project/construction teams and to perform other duties in support of the project;
- For staff expected to perform on-call, shift hours, or other work outside ITER Organization reference working hours, including nights, weekends, and public holidays, **the possession of a driving license valid in France is required. no commuting vehicle will be provided by the ITER Organization.**
- Informs management of any important and urgent issues that cannot be handled by line or matrix management and that may jeopardize the achievement of the Project's objectives;

The ITER Organization (IO) is an Equal Opportunity organization committed to diversity and inclusive in the workplace.