Postdoctoral Researcher, Scattering Systems IO-PDR-11

Job Req Id: 6602

Job Req Status: Closed

Application deadline: 2022/10/31

Job Profile Candidates

The ITER Organization brings together people from all over the world to be part of a thrilling human adventure in southern France—building the ITER Tokamak. We require the best people in every domain.

We offer challenging full-time assignments in a wide range of areas and encourage applications from candidates with all levels of experience, from recent graduates to experienced professionals. Applications from under-represented ITER Members and from female candidates are strongly encouraged as the ITER Organization supports diversity and gender equality in the workplace.

Our working environment is truly multi-cultural, with 29 different nationalities represented among staff. The ITER Organization Code of Conduct gives guidance in matters of professional ethics to all staff and serves as a reference for the public with regards to the standards of conduct that third parties are entitled to expect when dealing with the ITER Organization.

The south of France is blessed with a very privileged living environment and a mild and sunny climate. The ITER Project is based in Saint Paul-lez-Durance, located between the southern Alps and the Mediterranean Sea —an area offering every conceivable sporting, leisure, and cultural opportunity.

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

Application deadline: 31/10/2022

Domain: Engineering Domain

Department: Engineering Design Department

Division: Port Plugs & Diagnostics Division

Section: In-Vessel Diagnostics Section

Group: Laser and Microwave Systems

Job Family: Scientific Coordination

Job Role: Post Doc Researcher

Job Grade: P1

Language requirements: Fluent in English (written & spoken)

Contract duration: 2 years

Purpose

As a Postdoctoral Researcher, you will propose, assess, model and develop design solutions for optical scattering diagnostics. The aim will be to find improvements in the areas of: measurement performance, availability, reliability, maintainability, operability and cost effectiveness. Operability includes finding synergies between systems and developing cross-checks that could be implemented in the data flows to interfacing systems (other diagnostics and the control systems), real-time data quality and fault reporting taking advantage of information from other systems etc.

Background

ITER employs multiple scattering systems to measure the electron temperature and density.

- A core Thomson system with two-wavelength capability and polarimetric Thomson interface;
- An edge Thomson system overlapping with the core range;
- A multi-beam divertor Thomson system with multiple interfaces.

Work on these systems is performed in close collaboration with IO stakeholders and industrial partners. Currently, work is ongoing in Europe, Japan, Russia and the United States and the systems have mostly concluded their conceptual designs and are in the early detailed to final design stages.

Key Duties, Scope, and Level of Accountability

- Carries out original research under an agreed program in support of the development of scattering systems;
- Develops models of operation of the Thomson systems, including synthetic models;
- Assesses the performance characteristics (including using raytracing codes) of the systems singly and in concert and proposes design improvements;
- Develops the methods of calibration, operation, alignment and real-time data integrity checking;
- Develops R&D proposals, ensures their placement and assesses the results;
- Assists the responsible officers with system enhancements and critical reviews;
- As appropriate, establishes collaborations with researchers in related areas in the ITER Members;
- Publishes the results of research in appropriate conference proceedings and refereed journals;
- May be requested to be part of any of the project/construction teams and to perform other duties in support of the project;
- May be required to work outside ITER Organization reference working hours, including nights, week-ends and public holidays.

Measure of Effectiveness

- Contributes effectively to progress in the area of fusion science or technology defined by the agreed research or engineering program;
- Sets up complex multi-physics models for optical and engineering benchmarking;
- Produces clear analyses to support design choices;
- Evaluates error and assesses performance of algorithms with realistic error sources;
- Generates clear, publication-quality material for conferences and journals.

Experience & Profile

- ***Professional Experience:***
  - Minimum 2 years' experience of complex optical problems, preferably with experimental verification, in addition to one year in any field of research.
- ***Education:***
  - PhD degree or equivalent in Physics or Engineering field or other relevant discipline;
  - The required education degree may be substituted by extensive professional experience involving similar work responsibilities and/or additional training certificates in relevant domains.
- ***Language requirements:***
  - Fluent in English (written and spoken).
- ***Technical competencies and demonstrated experience in:***
  - Physics or engineering, with emphasis on lasers, optics and data analysis;
  - Awareness of computer science, with some experience in coding algorithms;

- Familiarity of computer science, with some experience in coding algorithms;
- 'Out of the box' thinking and ability to adapt easily;
- Producing clear technical documentation and publishing or presenting technical and/or scientific reports on specific topics;
- Experience in tokamak engineering would be an advantage;
- Experience of optical design software would be an advantage.

- ***Behavioral competencies:***
  - Collaborate: Ability to facilitate dialogue with a wide variety of contributors and stakeholders;
  - Communicate Effectively: Ability to adjust communication content and style to deliver messages to work effectively in a multi-cultural environment;
  - Drive results: Ability to persist in the face of challenges to meet deadlines with high standards;
  - Manage Complexity: Ability to analyze multiple and diverse sources of information to understand problems accurately before moving to proposals;

  Instill trust: Ability to apply high standards of team mindset, trust, excellence, loyalty and integrity.

Others *Necessary qualifications*

- The applicant must have received their PhD since 1 January 2019, or must receive their PhD prior to the deadline for beginning the Fellowship at the ITER Organization.
- The e-Recruitment system will require you to:

  1) Fill-in an online application file;

  2) Upload your Curriculum Vitae (including a list of your publications and photocopies of your highest academic qualification) merged in one unique PDF document;

  3) Upload a letter of motivation (limited to 1 page) merged with at least two letters of recommendation into one unique PDF document.

The following important information shall apply to all jobs at ITER Organization:

- Maintains a strong commitment to the implementation and perpetuation of the ITER Safety Program, ITER Values (Trust; Loyalty; Integrity; Excellence; Team mind set; Diversity and Inclusiveness) and Code of Conduct;
- ITER Core technical competencies of 1) Nuclear Safety, environment, radioprotection and pressured equipment 2) Occupational Health, safety & security 3) 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 work on beryllium-containing components. In this case, you will be required to follow the established ITER Beryllium Management Program for working safely with beryllium. Training and support will be provided by the ITER Organization;
- May be requested to be part of any of the project/construction teams and to perform other duties in support of the project;
- Informs the IO Director-General, Domain Head, or Department/Office Head of any important and urgent issues that cannot be handled by line management and that may jeopardize the achievement of the Project's objectives.