Job Title: Scientist High Fidelity Plasma Simulator IO1101

Requisition ID **5840** - Posted - (France, 13067 St Paul Lez Durance Cedex) - **Science and Technology Expertise** - **New Posting**

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: 17/04/2022
Domain: Science & Operation
Department: Science,Controls & Operation
Division: Science
Section: Plasma Modeling and Analysis
Job Family: Scientific Coordination
Job Role: Scientist – 2
Job Grade: P3
Language requirements: Fluent in English (written & spoken)
Contract duration: Up to 5 years

Purpose

As a Scientist, you will significantly contribute to the development of a High Fidelity Plasma Simulator (HFPS) for ITER by integrating free-boundary plasma equilibrium evolution, core-edge- Scrape-Off Layer (SOL) plasma transport and fuelling, heating and current drive sources;
You will perform activities for ITER's operation and the completion of remaining ITER systems design and planning through the preparation of high physics fidelity plasma simulations.

Background

The achievement of ITER's mission goals requires predictive plasma simulation capabilities capturing all necessary physics processes to guide the execution of the ITER Research Plan.
The physics fidelity of the various integrated models is expected to be refined in response to operational experience on ITER and other devices.
Interpretive modelling of the measured plasma behaviour is important to understand the plasma's internal state and to advance the research programme.
ITER's Integrated Modelling & Analysis Suite (IMAS) builds around a standardized data representation and is the framework within which all integrated modelling and interpretation tools will be developed.

Key Duties, Scope, and Level of Accountability

- Contributes to the development of ITER's HFPS and the development and integration of physics components into Integrated Modelling & Analysis Suite (IMAS);
- Leads verification of the integrity of coupled physics components and numerical convergence of code coupling methodologies;
- Specifies and analyses ITER plasma operation scenarios by performing high fidelity physics simulations of ITER plasmas;
- Contributes to the definition of ITER requirements for an integrated plasma modelling and data analysis capability for high fidelity plasma physics simulations;
- Advances high fidelity simulations and analyses of plasma operation scenarios designed to meet ITER's performance specifications using a range of computational tools available at ITER and within the Members' fusion communities;
- Leads the development of co-simulations capabilities of the HFPS and Plasma Control System Simulation Platform (PCSSP), and contributes to the validation of control-oriented physics models in PCSSP;
- Contributes to the assessment of control requirements and analyses of control scenarios using co-simulation capabilities of HFPS and PCSSP;
- Contributes to the definition and co-ordination of a program of experimental and modelling Research & Development (R&D) activities to advance the development of ITER high fidelity physics models;
- Integrates R&D results and analysis from the ITER Members in the areas of high fidelity physics models, and the analysis of their implications for ITER plasma operation;
- Coordinates and interacts with experts in the ITER Members' fusion communities in the definition, implementation and monitoring of relevant activities in these areas;
- Prepares and reviews documentation defining aspects of plasma performance requirements for ITER operation;
- Contributes to the planning for ITER plasma commissioning and operation;
- Coordinates development and integration into IMAS of workflows and tools developed within the ITER Members' R&D programmes to expand data processing, interpretation and analysis capabilities;
- Coordinates activities of ITER staff, visiting researchers and ITER Scientist Fellows contributing to work in the area of data processing and interpretation;
- Provides expert scientific and technical inputs to either resolve key scientific or technical issues or enhance technical decision making;
- Supports the Section Leader in the implementation and execution of the section work programme, including voluntary R&D programmes in the ITER Members institutions such as the International Tokamak Physics Activities (ITPA) and the ITER Scientist Fellow Network (ISFN).
- 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

- Advances the ITER Organization's capability for performing high physics fidelity simulations of ITER plasma scenarios and plasma control;
- Conceives and implements effective solutions to experimental data interpretation and analysis with emphasis on interpretive transport modelling;
- Ensures development and delivery of user-friendly IMAS tools to support the execution of the ITER Research Plan and programmatic decision making;
- Interacts with and efficiently co-ordinates experts from within the ITER Members in the definition, implementation and monitoring of activities in his/her area of responsibility;
- Effectively supports the schedule & cost for ITER operations by anticipating and solving issues;

- Facilitates productive collaborations in the area of predictive and interpretive modelling of ITER plasmas to expedite execution of the ITER Research Plan;
- Maintains effective support for ITER diagnostic design and performance assessment activities by provision of predictive simulations of ITER plasma scenarios;
- Develops, implements and executes efficiently within the defined schedule, R&D activities with the international fusion community in support of ITER construction and the preparations for operation.

Experience & Profile

- ***Professional Experience:***
  - At least 6 years' experience in fusion-relevant research, dependent on academic qualifications, with significant project management experience and proven technical leadership abilities.
- ***Education:***
  - PhD degree or equivalent in plasma physics 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:***
  - Developing and performing time-dependent core-edge-SOL transport modelling of plasma scenarios;
  - Modelling free-boundary plasma equilibrium evolution;
  - Magnetic and kinetic plasma controls;
  - Analysis of fusion-relevant experiments and interpretative plasma modelling;
  - Plasma fuelling, auxiliary plasma heating and current drive, and MHD instabilities;
  - Numerical techniques for the implementation of sophisticated modelling and analysis tools;
  - Producing high quality standard written scientific and/or technical documents;
  - Developing and managing high-performance scientific software used for simulating plasma evolution.
- ***Behavioral Competencies:***
  - Collaborate: Ability to facilitate dialogue with a wide variety of contributors and stakeholders, in particular with other scientists or experts having multi-cultural background;
  - 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.

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.