Postdoctoral Fellowship Positions at Theory and Computational Science Division, General Atomics, San Diego, CA, USA

The General Atomics Theory and Computational Science Division conducts fundamental research in the theory of fusion plasmas and facilitates scientific discovery through advanced computing. Located at the site of the DIII-D National Fusion Facility, the Division provides theoretical, simulation and modeling support to DIII-D, as well as to ITER and other fusion experiments worldwide.

We currently have 5 post-doc positions covering a range of topic in Fusion Theory and Modeling. These post-doc appointments are administered by Oak Ridge Associated Universities (ORAU).

Validation of gyrokinetic and magnetohydrodynamic (MHD) theories on NSTX-U. The gyrokinetic theory of turbulent transport, and the MHD theory of peeling-ballooning stability, have proven to be accurate physics models of conventional aspect ratio tokamak plasmas. The General Atomics Theory and Computational Science (GA-Theory) division has been awarded a grant to extend the validation of these theories, and reduced models for transport and pedestal structure, to the low aspect ratio geometry of the National Spherical Torus Experiment Upgrade (NSTX-U) operated by the Princeton Plasmas Physics Laboratory (PPPL).

We currently have two exciting opportunities for outstanding candidates to undertake postdoctoral positions onsite at PPPL representing GA-Theory in close collaboration with NSTX-U researchers. The successful candidates will be given training as a theoretical analyst, validating codes developed by GA-Theory for turbulent transport and pedestal structure with existing and new NSTX-U data. A theoretical analyst participates in the planning, execution, and analysis of experiments as a collaborator in the experimental program. In addition, the fidelity of reduced transport models to gyrokinetic turbulence simulations and linear stability will be verified. A validated reduced model for pedestal structure and stability is a shared goal of this grant with the NSTX-U research plan. Two positions, one focused on transport and the other on pedestal structure are open. The training given by GA-Theory scientist will equip the candidate with state-of-the-art gyrokinetic simulation experience with the CGYRO code that is optimized for the exascale computing environment. The candidate will learn the methods used to construct the quasi-linear transport model TGLF and the pedestal structure model EPED from their primary developers. They will also learn to run a new, high resolution, version of the peeling-ballooning code ELITE and a new variable resolution gyro-fluid eigensolver that have been developed for spherical tori. This knowledge, and the experience of working in the exciting collaborative environment of NSTX-U, will build the foundation for a career in fusion energy research.

Interested candidates should contact Dr. Gary Staebler (staebler@fusion.gat.com) now.

High performance computing simulations of boundary plasma in tokamaks. We are seeking a Postdoctoral Fellow with demonstrated computational expertise in boundary plasma transport modeling and/or expertise in scientific high performance computing code development. The successful applicant will develop high performance computing simulations of boundary plasma transport in tokamaks to advance the design of the next generation of fusion reactors. The Postdoctoral Fellow is expected to publish original research in refereed journals and present results at appropriate technical conferences.

The candidate should be:

1. self-motivated and creative.
2. able to function effectively in a team environment.
3. experienced with scientific code development
4. experienced with Unix/Linux and with at least one scientific programming language(C, C++, Fortran) and one scripting language (Python,Matlab, Julia).

Applicants for this position must have obtained a PhD in a relevant physics or engineering discipline and demonstrated research ability through publications, reports and presentations.

Interested candidates should contact Dr. Jerome Guterl (guterlj@fusion.gat.com)

Plasma-material interactions in tokamaks. We are seeking a Postdoctoral Fellow with computational expertise in plasma-material interactions and/or in magnetic confinement plasma physics. The successful applicant will conduct theoretical and computational studies of dynamic fuel recycling and transport of neutrals and impurities in boundary plasmas to advance the understanding of plasma-material interactions and scrape-off plasma transport in tokamaks. The Postdoctoral Fellow will also interact with experimental groups to propose and analyze dedicated experiments conducted at DIII-D. The successful applicant is expected to publish original research in refereed journals and present results at appropriate technical conferences.

The candidate should be:

- self-motivated and creative.
- able to function effectively in a team environment.
- experienced with Unix/Linux and with at least one scientific programming language(C, C++, Fortran) and one scripting language (Python,Matlab, Julia).

Applicants for this position must have obtained a PhD in a relevant physics or engineering discipline and demonstrated research ability through publications, reports and presentations.

Interested candidates should contact Dr. Jerome Guterl (guterlj@fusion.gat.com)

Macroscopic MHD modeling in tokamaks. We are seeking a Postdoctoral Fellow with demonstrated computational expertise in modeling macroscopic magnetohydrodynamic (MHD) phenomena in tokamak devices and/or expertise in MHD code development. The

successful applicant will help to develop existing MHD codes in the Division and to apply the codes to model MHD instabilities as well as 3-D physics in DIII-D and other international fusion experiments. The Postdoctoral Fellow is expected to publish original research in refereed journals and present results at appropriate technical conferences.

The candidate should be:

- self-motivated and creative
- able to function effectively in a team environment
- experienced with scientific code development
- experienced with modeling MHD or 3-D physics in tokamaks
- experienced with Unix/Linux and with at least one scientific programming language (C, C++, Fortran) and one scripting language (Python, Matlab, Julia)

Applicants for this position must have obtained a PhD in a relevant physics or engineering discipline and demonstrated research ability through publications, reports and presentations.

Interested candidates should contact Dr. Yueqiang Liu (liuy@fusion.gat.com)

GA Theory and Computational Science Division web page:
https://fusion.gat.com/global/theory/home