

Postdoctoral positions in High Energy Density Physics

The Pulsed Power Plasmas Group at the University of California San Diego's Center for Energy Research is seeking Postdoctoral Researchers to support pulsed power and high-intensity laser generated plasma experiments. The postdoctoral researchers will be responsible for conducting experiments, data analyses, and dissemination of research findings. As members of the P³ group, postdoctoral researchers will interact with students and researchers, with the opportunity to learn and participate in additional research projects from P³ group members. Several projects are available in Basic plasma science, High Energy Density science, Advanced Diagnostic development for HED facilities, Laboratory Astrophysics, Inertial Confinement Fusion, and plasma source production for XUV lithography and x-ray microscopy applications.

- 1) **X-ray Refraction-based Diagnostics**: Development of X-ray Phase-Contrast diagnostics for HED experiments. Talbot X-ray interferometry capabilities will be further expanded to improve diagnostic performance to optimize characterization of ICF-relevant plasmas. Diagnostic instruments will be developed on-site at the University of California San Diego and at The Johns Hopkins University. Diagnostic platforms will be deployed in Omega EP experiments at the Laboratory for Laser Energetics studying laser-target plasma ablation and shell release dynamics. Additional diagnostic platforms will be benchmarked in future HED experiments at high-intensity lasers, pulsed power generators, and X-ray Free Electron Laser facilities. Shock and ablation dynamics of laser-irradiated foams will be studied at SLAC's Linac Coherent Light Source (LCLS) using the Matter Under Extreme Conditions instrument.
- 2) **The pulsed power-driven HED science** position will involve designing and carrying out experiments on in-house pulsed power drivers (200-750kA, 1 μ s risetime) using a range of diagnostics methods including gated imaging, spectroscopy, and Thomson scattering. Quantitative analysis of inertial fusion-related or laboratory astrophysics plasmas is key to the comparison to simulation work. There is a range of work being carried out, including plasma shock formation, liner implosion, diagnostic development and MHD simulations, and specific research projects can be tailored to the interests of individual applicants. There will also be opportunities to carry out collaborative work with our colleagues at a range of universities and national laboratories.
- 3) **XUV plasma sources**: We have projects in laser-produced plasma sources for XUV radiation generation. The aims are to understand the basic physics at laser intensities $\sim 10^{14}$ W/cm² to optimize the efficiency of XUV generation (2-20 nm). Plasmas are typically generated from cryogenic solids, multi-shell gas jets or cryogenic gas clusters. These sources will be characterized using spectroscopy, imaging, and calibrated radiation detectors to determine their suitability as compact (table-top) sources for UV lithography and x-ray microscopy in the

water window (2-4 nm) for biological sample imaging. These projects are closely tied to commercial partners, and there will be opportunities to interact directly with researchers from industry.

We invite applicants to submit a CV including a list of relevant publications to Dr. Simon Bott-Suzuki (sbottsuzuki@ucsd.edu) and Dr. Pia Valdivia (mpvaldivialeiva@ucsd.edu). General inquiries about the appointments and specific research questions are welcome. For more information about The Pulsed Plasma Group research areas, please visit <https://www.p3ucsd.com/>

Qualifications: A PhD in Plasma Physics or closely related field is required. We welcome applications from candidates with experimental and computational research experience. Experience in X-ray diagnostics and instrumentation, and pulsed power, and/or laser driven plasmas is an advantage.

Appointment duration: The appointment is for one year with potential renewal for further years, dependent on performance and availability of funding.

Salary: Salary based on UC pay scales and applicant experience.

Closing Date: We encourage candidates to send applications as soon as possible. The search will remain open until the positions are filled.

The University of California San Diego is an Equal Opportunity/Affirmative Action Employer advancing inclusive excellence. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability, age, covered veteran status, or other protected categories covered by the UC nondiscrimination policy. The University of California is committed to academic excellence and diversity within the faculty, staff, and student body (<https://diversity.ucsd.edu/>).

*As a condition of employment, you will be required to comply with the University of California SARS-CoV-2 (COVID-19) Vaccination Program Policy. All Covered Individuals under the policy must provide proof of Full Vaccination or, if applicable, submit a request for Exception (based on Medical Exemption, Disability, and/or Religious Objection) or Deferral (based on pregnancy) no later than the applicable deadline. Please refer to Appendix F, Section II.C. of the policy for the deadlines applicable to new University of California employees. (Capitalized terms in this paragraph are defined in the policy.) Federal, state, or local public health directives may impose additional requirements.