Job description – Research Associate in SPEAR3 Accelerator Physics Group, SLAC National Accelerator Laboratory

SPEAR3 is one of the four US third generation light sources – electron storage rings dedicated to producing brilliant X-ray beams. SPEAR3 serves Stanford Synchrotron Radiation Lightsource (SSRL), which is a national user facility with the longest history of utilizing synchrotron radiation for multi-disciplinary experiments. Re-built and commissioned in 2004, SPEAR3 has seen a steady improvement in performance made possible by a series of upgrades. To ensure the facility’s future success, we are developing long term upgrade plans that would give SPEAR3 unique abilities for X-ray sciences. The ability of producing intense, short X-ray pulses with duration of 1-10 ps (FWHM) is the primary candidate. We are seeking a research associate to work on this project.

**Mission:** The main tasks are developing short pulse upgrade plans for the SPEAR3 storage ring and studying related accelerator physics issues. The RA will also be involved in SPEAR3 operation R&D work.

The primary short pulse scheme being investigated for SPEAR3 is the two-frequency crab cavity method. It utilizes crab cavities of two different frequencies to tilt selected electron bunches in the y-z plane while leaving the others unaffected. Beam dynamics issues for the scheme include linear and nonlinear beam motion with crab cavities, effects of rf noise, effects of crab cavity imperfections, and collective effects and mitigations. Beamline optics pertinent to short pulse selection may also be studied. System design optimization will be conducted, considering lattice options, crab cavity parameter options, separation of short and long pulses, and operation conditions. Thorough prediction of short pulse performance with all practical issues considered will be done through simulation.

**Qualifications:**
The candidate is expected to hold a PhD degree in physics or have equivalent competence. The candidates need to be highly motivated in scientific research, have a strong background in accelerator physics (theories of single particle dynamics and collective effects), and have strong mathematic and computational skills. Familiarity with accelerator modeling and simulation tools, such as Elegant, MAD and Accelerator Toolbox, is highly preferred. Past experience with linac, synchrotron, storage ring, or super-conducting RF is a plus.

**Contact:**
Please send in a cover letter, a CV with a list of publications and have three of your referees send letters of recommendation directly to Dr. James Safranek at the address below

SLAC National Accelerator Lab
2575 Sand Hill Road, MS 69
Menlo Park, CA 94025
Tel: 650-926-5438
Email: safranek@slac.stanford.edu