Lee Teng Summer Intern Mentor Volunteer Form

Name of mentor: Jerry A. Nolen

Name of administrative assistant for mentor: Janet Bergman / Barbara Fletcher

Argonne division: Physics Division

Argonne office location and office phone: 203 – A113 / (630) 252-6418

Email: nolen@anl.gov

**Project description**: XMAT linac design and simulations

We are designing a linear accelerator (linac) for a new Extreme Material (XMAT) facility at Argonne. The facility is for material irradiation using ion beams produced by the linac. The defects to the irradiated materials will be studied using photons from the Advanced Photon Source (APS) at Argonne. This project focuses on the design and simulations of the linac including a Radio-Frequency Quadrupole (RFQ) and several room temperature cavities. Following the linac lattice design, consisting of the optimization of focusing and accelerating forces, end-to-end beam dynamics simulations will be performed for different ion beams. The beam spot must be very small at the final image and a magnetic de-magnifying stage is to be designed using either superconducting solenoids or quadrupole magnets.

This effort is ongoing and the interested student should be able to contribute to any part of the work, which should be a great learning experience and a good introduction to accelerator physics.

**List any skills a student might have that are of particular interest:**

Basic knowledge of beam optics

Computing and analytical skills

**List any special safety training needs you would have for your intern:**

No special safety training is required