Postdoctoral Mentoring Plan

We intend to bring on one post-doctoral scholar during this project, who will be engaged in all aspects of the MRI, from project management, instrument design, construction and testing, and result communication, to student mentoring and other education and training opportunities that will be established through the broader impacts activities of the project. The post-doctoral scholar’s primary mentor will be PI Hudson, but as a co-leader of the project management group (working closely with Chan and Hudson), the scholar will necessarily interact with the faculty leading each of the development subgroups, as well as with our two industrial representatives, Schaff and Shvarts, expanding opportunities to receive advice from and be introduced to the culture of a broad range of academic departments (physics, chemistry, electrical engineering and materials science) and industry. Additionally, Penn State’s Office of Postdoctoral Affairs provides many useful resources for postdocs at PSU and offers workshops, assessment opportunities, and other events to encourage successful mentoring and training of postdoctoral scholars. The scholar and mentor will use this resource to its fullest extent.

Initial mentoring of the post-doctoral scholar will focus on project management skills, including issues such as time management and how to effectively manage more senior personnel, as well as on instrumentation topics. Although we expect that the scholar who takes this position will come with a plethora of relevant research experience in SPM and low temperature physics, as well as, we hope, instrument development experience, because of the breadth of instrumentation being developed, the scholar will need to receive training in unfamiliar skills. The scholar will also be expected to serve as the primary mentor for students involved in the instrument development and will receive training and feedback on this mentoring.

As the testing phase of the project begins, mentoring will shift toward the presentation of scientific research, both through manuscript preparation (the scholar will be expected to take the lead in the final instrumentation report) and conference presentations. As Hudson chairs the American Physical Society’s topical group for Instrumentation and Measurement Science (GIMS), the scholar will be encouraged to participate in their activities to further develop presentation and networking skills.

As the project nears completion, mentoring will shift toward promoting the career of the scholar, including CV development and research proposal/grant writing skills. As the project transitions from a focus on instrumentation to science, the scholar will be encouraged to assist in the preparation of a grant proposal for student support for the first research activity, with particular attention paid to best practices in proposal preparation, including identification of key research questions, definition of objectives, description of approach and rationale, and construction of a work plan, timeline, and budget. This is crucial to ensure that the scholar gains a scientific research background, in addition to previously gained instrumentation development skills. Further career development mentoring will depend on need. For example, if the scholar seeks an academic career, Hudson will provide opportunities to guest lecture (he teaches Penn State’s 1000 student introductory physics courses) and provide constructive feedback.

The mentor-scholar plan will be assessed annually and refined as necessary, alongside constructive performance evaluations based on previously specified goals, tailored, in part, to the needs of the scholar. Overall success of the mentoring plan will be assessed by tracking the postdoctoral scholar’s progress towards specified career goals after completion of the postdoctoral program.