

**Setting Expectations and Learning Goals for Your Internship**

**Intern Name:** Melody Nguyen

**Mentor Name:** Kevin Stone

**Project Title:** Autonomous Experimentation for Powder Diffraction

**Department:** SSRL MSD

**Internship Start and End Date**: June 16, 2025 – August 22, 2025

1. **EXPECTATIONS *(To be completed by mentor and discussed/agreed upon with intern)*:**

**Job/function:** Describe the intern’s summer project? What should the student know about the department prior to starting the role?

The goal of this proposal is to create an infrastructure for autonomous beamline experiments utilizing multi-modal approaches at SSRL. In particular, this project will be focused on self-driving experiments on a powder diffraction beamline equipped with a low resolution but fast detector and a high resolution but slower detector. We will develop a workflow to autonomously drive data collection using both detectors to maximize information during sample evolution. We will demonstrate this on BL2-1 using powder samples heated through a phase transition as a test case. The goal is to demonstrate this concept, test several decision making algorithms to drive data collection, and assess the performance of this approach. Much of the foundational components needed for this are in place, we have an interface to run the beamline through a python interface which will be used for the autonomous workflow. As part of this project, the intern will learn the basics of powder diffraction, especially as this is done at a synchrotron, develop and apply a functioning python based workflow, perform data analysis, and learn some chemistry.

**Supervision:** Decide when, where and how frequently you will meet. Agree to maintain momentum by keeping to your meeting schedule but discuss what you will do if one of you needs to postpone a meeting. *Decide on a date for a verbal mid-point evaluation to assess intern progress.*

We will meet in Kevin’s office at a minimum of twice a week. These can be short check-ins or longer discussions as needed. If meetings need to be rescheduled, we will have a quick check in through email or other means to ensure that no pressing issues are missed as a result.

**Establish Regular Meeting Agenda:** mentor agenda items AND intern agenda items – at every meeting. Agenda items can include topics such as: project questions and status, work situation status, learning and skill development updates. Discuss the intern’s preferred learning styles (visual, kinesthetic, auditory).

Meetings can be flexible, but the goal of each meeting will be a basic check in to see how things are going and if there are any issues that need to be addressed. Meetings will also cover a basic overview of progress since the previous meeting, a review of the steps agreed upon during that meeting, an opportunity to talk about any questions or aspects of the project that are unclear, and end with clear next steps for both myself and the intern.

**Clarify Roles/Establish Purpose:** The role of a mentor is to share expertise, advise, advocate, coach, and support. The role of the mentee is to seek advice and take steps toward professional growth. *Considerations for intern - are you prepared to be proactive? Do you understand your line of management structure?* *Do you know the steps to get from intern to graduate**school or early-stage research scientist?*

As part of our initial meetings, we will determine the longer term goals for the intern. The main goal from my perspective is to give the intern a view of what scientific research involves, an opportunity to learn, and to set them up for meeting their longer term goals. This works best if the intern is open about their goals and pro-active in making sure that they get as much as possible from this experience.

**Culture:** Mentoring works best when the participants can interact in an “open door” environment but agree to some ground rules. Are impromptu drop-in meetings acceptable? What kind of turn-around can each of you expect when the other sends an e-mail? *Brief intern on professional development opportunities, mentor style, workplace expectation, company values/mission, and leadership at the organization.*

I prefer to have an open door policy, if I am in my office and the door is open then people are welcome to come in and ask me questions or have discussions. The same applies when I am working elsewhere, specifically at a beamline, although expectations for my time and attention should be tempered in these situations. I prefer to have a casual mentoring relationship, letting my interns work however is best for them as long as progress is being made. I like to be available to teach when questions arise, and guide rather than dictate what next steps should be. The expectation is that people in my group will be self motivated and work hard on their project, and in return I try to give them a good amount of freedom.

**Discuss Constructive Feedback:** In a healthy partnership, both parties can give and take constructive feedback. A mentor may give critical input to help an intern learn a new skill, change methods, or build awareness. In turn, an intern may counter a recommendation or ask for a different kind of support from the mentor. *Seek advice from peers or HR at the lab if you feel you have reached an impasse. Don’t let one disagreement completely derail the mentoring relationship.*

I want to foster an open dialogue where people are comfortable giving feedback if my mentoring style is not working for them. I will provide constructive feedback in return, hopefully we can create this environment where neither party takes criticism personally but rather as an opportunity to grow.

**Hours:** What are the projected work hours and days for the intern? Mentor, co-mentor, or appointed SLAC employee must be on campus with the intern.

I expect the intern to work normal hours and to be available on site essentially every day. If I have to be away I will ensure that the intern has both clear guidance on what to do while I am away and that there is a clearly designated person for them to go to as needed, this will likely be a postdoc in my group or another staff member.

1. **GOALS *(To be completed by intern and discussed/reviewed with mentor)*:**

These goals must be related to what the intern can reasonably achieve within the timeframe involved— and should include transferable marketable skills. Please keep in mind that the goals must be Specific, Measurable, Attainable, Realistic and Time-bound (S.M.A.R.T.) as in the example below. To ensure successful progress and completion, make sure to revisit these goals halfway through the internship and at the end of the internship.

Please use the blank forms below to write **two** learning goals for your internship experience. Share them with your Mentor, and obtain their signature, to make sure that your goals make sense within the context of your internship. 

**SMART GOALS *(To be completed by Intern and reviewed by mentor)*:**

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| **Goal 1:** Control beamline & run everything automatically | |
| **Specific:** What I want to learn | Develop a workflow for the computer to decide when to use each detector. I hope to improve my skills in writing Python code. |
| **Measurable:** How will I know I reached my goal? | Understand differencing factors for the beamline based on sample type (Blurry and fast, or clear and slow). |
| **Attainable?** How will I do it in a way that is reasonably within my reach? | Learning conceptually before coding, consistent check ins with my mentor, and try out different decision-making methods for when and how to collect data. |
| **Realistic:** How will I do it  given my time constraints (10 weeks) | First few weeks, I will utilize and study the existing Python code. By July, identifying and focus on two main improvements.  Toward the end July, begin testing samples & analyze data.  Early August, work on revisions. |
| **Time-Bound:** Deadline | End of the summer, complete all SULI deliverables. |
| **Reaching this goal matters because:** | My previous years at SLAC I’ve done front-end/web design and data science. I’d love to use this summer as a new opportunity to learn backend. |

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| **Goal 2:** Understand Synchrotrons experiments | |
| **Specific:** What I want to learn | Learn how powder diffraction works and the ways to study materials using X-rays. |
| **Measurable:** How will I know I reached my goal? | Experiment with real samples on our specific beamline (BL2-1), analyze data, ask questions, and learn a bit of chemistry along the way. |
| **Attainable?** How will I do it in a way that is reasonably within my reach? | Test and reevaluate each step of the way. Brainstorm and talk it out with my peers so I understand what it’s used for and why it’s done at SSRL. |
| **Realistic:** How will I do it  given my time constraints (10 weeks) | I will create a timeline and conceptual check points for each week, so I am on track. |
| **Time-Bound:** Deadline | End of the summer. |
| **Reaching this goal matters because:** | I am curious to get hands-on experience with SLAC’s powerful X-rays and accelerators and become more involved with the science aspect of the research. |

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| **Goal 3:** Career Exploration | |
| **Specific:** What I want to learn | Options for my Master’s degree. |
| **Measurable:** How will I know I reached my goal? | Learn about the ways how I can help others. Whether that’s public policy/law for environmental protection, biotech, or ethical product management and development. |
| **Attainable?** How will I do it in a way that is reasonably within my reach? | Attend SLAC talks, visit friends from different departments, go on lab tours, connect with professors on campus. |
| **Realistic:** How will I do it  given my time constraints (10 weeks) | Meet with one new person every week. Chatting with people who are passionate about the same field would be super helpful for deciding what degree I could pursue afterwards.  Ideally someone in a different career field each time. |
| **Time-Bound:** Deadline | I hope to stay connected with those I find interesting and make lifelong friends/mentors. |
| **Reaching this goal matters because:** | My end goal is to work at SLAC or a tech company for a year before going into my Masters. |



**Intern Signature: Date: 5/17/2025**



**Mentor Signature: Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Revised: 5/9/2024