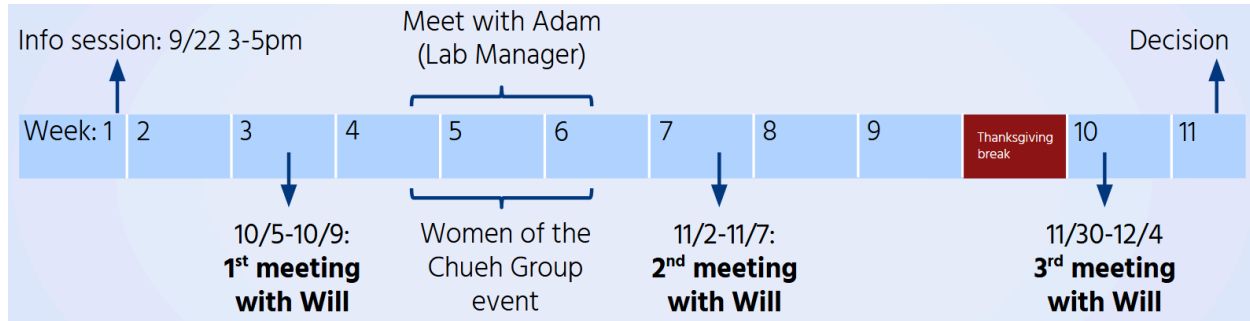


2026-2027 PhD Recruitment Process

We want you in the Chueh Group!

Timeline:



General points of contact for this process:

1. Isabel Davidoff (isabeld7@stanford.edu)
2. Raul Bodrogean (raulb@stanford.edu)
3. Adam Marks (adammarks@stanford.edu)
4. Kyle Frohna (frohnak@stanford.edu)

1. Get to know the group

- Visit our [website](#). Here you can find published papers, graduated members' theses, current members' email addresses, information on our equity and inclusion efforts, and more.
- We also encourage you to review our Norms and Values document [linked here](#). This document provides an overview of the Chueh Group's core values and approaches to science, collaboration, and more. Feel free to discuss questions you have about this document with group members and Will!

2. Get connected with the group

- **Attend the Chueh group info session in the Fall (Tuesday, 9/22, 3-5 PM in Durand 450).** We will give an introduction to the group, subgroups, general themes that we work on, and present specific projects we're recruiting for. This will serve as time for you to ask questions and interact with group members in person (food will be provided afterwards). This is a great opportunity to see the group as a whole. We encourage you to reach out to multiple people afterward to learn more specifically about what people do and what a potential project could be. The info session is a crucial part of our process - please reach out to the general points of contact (above) if you can't make it and we will forward you a recording.
- To meet current members and get a better idea of the ongoing research, we recommend **attending weekly group meetings (Fridays 10:30am-12:30pm in Durand 353)**. To receive information about this please sign up for our listserv: https://mailman.stanford.edu/mailman/listinfo/chueh_groupmeeting. Please feel free

to stay for Group Lunch afterward and talk to group members or to reach out to anyone.

- **After the info session, reach out to multiple “Points of Contact”** (see 6. Research Areas section below) to learn more about their research and the group. **We highly encourage you to attend as many subgroups as are of interest to you.** After the first few weeks, you can choose to focus on one subgroup, or continue to sample broadly across many. We always welcome new project ideas, especially if they are interdisciplinary across multiple subgroups. Throughout the rotation, Points of Contact will help you brainstorm possible research directions.
- **Meet with Adam Marks, our Lab Manager.** Every prospective student will get to meet with Adam between their 1st and 2nd meetings with Will. This meeting should serve as a check-in and a chance for you to ask him anything; he will also point you in the direction of additional group members to talk to based on your interests.
- **Women of the Chueh Group (WOCG) event.** Between the 1st and 2nd meetings with Will
 - Optional: This is a great opportunity to get to know some of the women in the group and to learn about their experiences both at Stanford and in the Chueh Group. We encourage any 1st-year students interested in the group to attend, especially women-identifying and gender-minority students, although all are welcome.

3. Meet with Will

Throughout the quarter, you will have three 30 minute meetings with Will. These will happen around Week 3, Week 7, and Week 10. During the meetings, you can present/discuss anything you like - suggestions on topics are below.

- **Meeting 1:** we suggest you come prepared to talk about previous research experiences in depth, research interests, what you are looking for in a lab etc. We also suggest coming with questions for Will - he is happy to talk about anything! You should use this first meeting as an introduction and gauge to see if our lab and Will are a good fit for you.
- **Meeting 2:** we suggest you come ready to talk about what you’ve learned or found interesting in the rotation thus far. This could be a paper or two that you’d like to talk about, thoughts about the methodology/results of current ongoing projects, your vision on some new directions, etc. While slides are not necessary, we encourage you to have a few to serve as a guide for the meeting.
- **Meeting 3:** this will likely be a continuation of Meeting 2. Will may give you a “homework assignment” at the end of Meeting 2 that you will talk about in Meeting 3. If not, you can do a deeper dive into one of the topics talked about in Meeting 2, or you can choose to stay broad and talk about a different topic/project that you found interesting in the later part of the rotation. The goal is to present Will with an idea of what you might work on if you join the group, although you will not be bound to this idea should you join.

We are a diverse and multi-faceted group and want you to shine on many axes. All members are here to help you prepare for your meetings with Will. Please do not hesitate to ask for help or feedback from us! Below are some criteria that Will and our group will be assessing:

Creativity

Scientific rigor

Communication skills

Collaborative spirit

Willingness to contribute to the Chueh group community

4. Decision

A decision will come out after the third meeting, usually at the end of the quarter. While Will makes this final decision, he also takes into account all group members' feedback.

5. What if you cannot participate in a fall quarter rotation but still want to join the group?

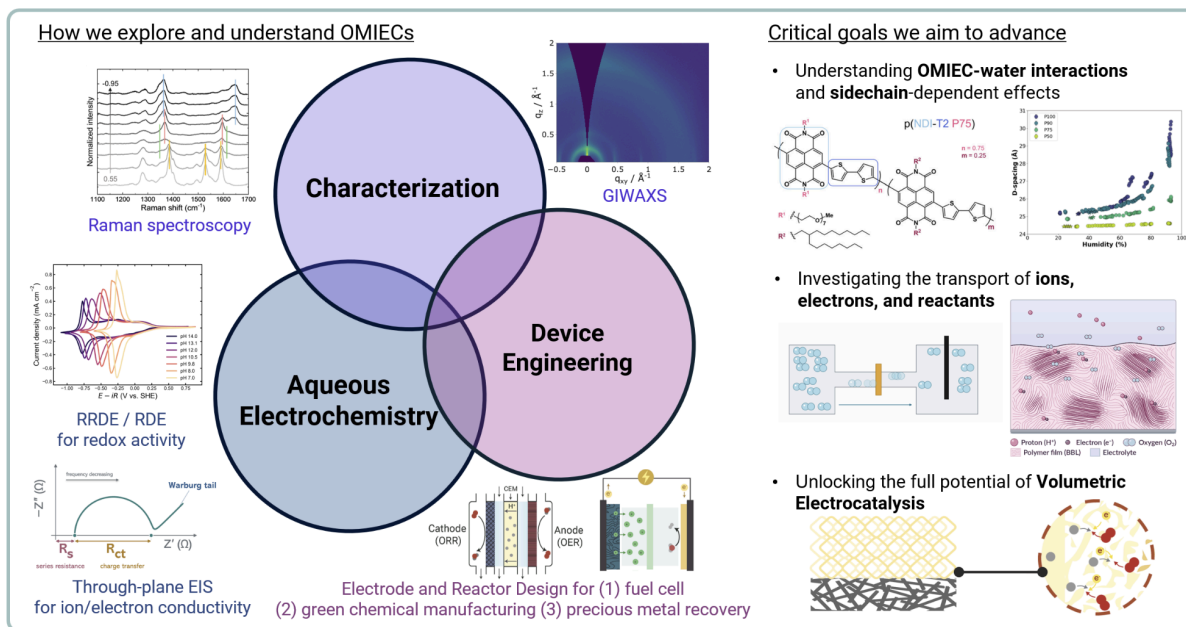
It is definitely possible and we encourage you to reach out! We do consider candidates during the winter quarter, but note that realistically space can be limited. However, if you are excited about the group, we want to learn about you, so don't discount yourself because of the timeline! **If you are rotating elsewhere in the fall, please still attend our info session in September to learn about available opportunities and keep us updated on your rotation plans.**

6. Research Areas and Potential Projects

In addition to being organized into specific subgroups, the research in our group falls into **three main themes**. Much of our work centers on **earth-abundant, inexpensive, and sustainable chemistries** (namely iron, sodium, and aqueous) and applies a range of techniques to understand and improve performance at every level, from individual materials to complete electrochemical devices. One major goal is the cheapest, most earth-abundant intercalation battery we can build: an anode-free sodium metal negative electrode paired with an iron-based layered oxide cathode. Another aspect of the group aims to **gain a deeper understanding of existing technologies** (e.g. Li-ion cathodes, solid-state batteries). Lastly, some of our research **leverages large datasets and automation to accelerate understanding of current technologies and development of new ones**. Below are some of the specific projects and broad research areas the group is currently pursuing. Please reach out to specific Points of Contact to learn more about the projects!

Polymer Team (aqueous):

Organic mixed ionic-electronic conducting polymers for electrochemistry

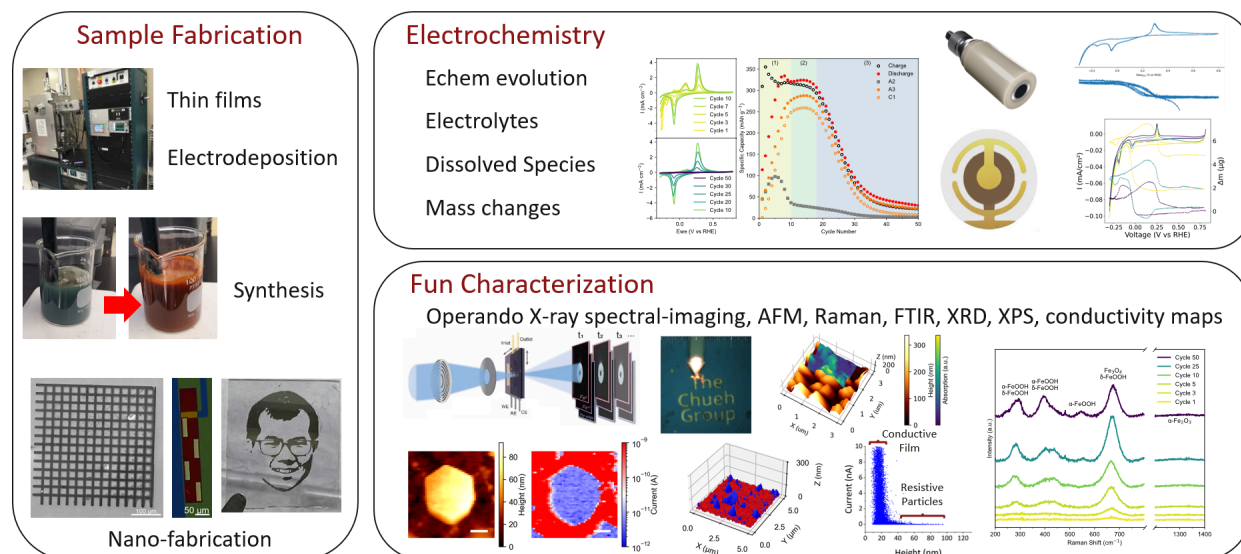


Points of Contact:

- Feng-Yang Chen (fc348@stanford.edu)
- Adam Marks (adammarks@stanford.edu)

Iron-air (aqueous):

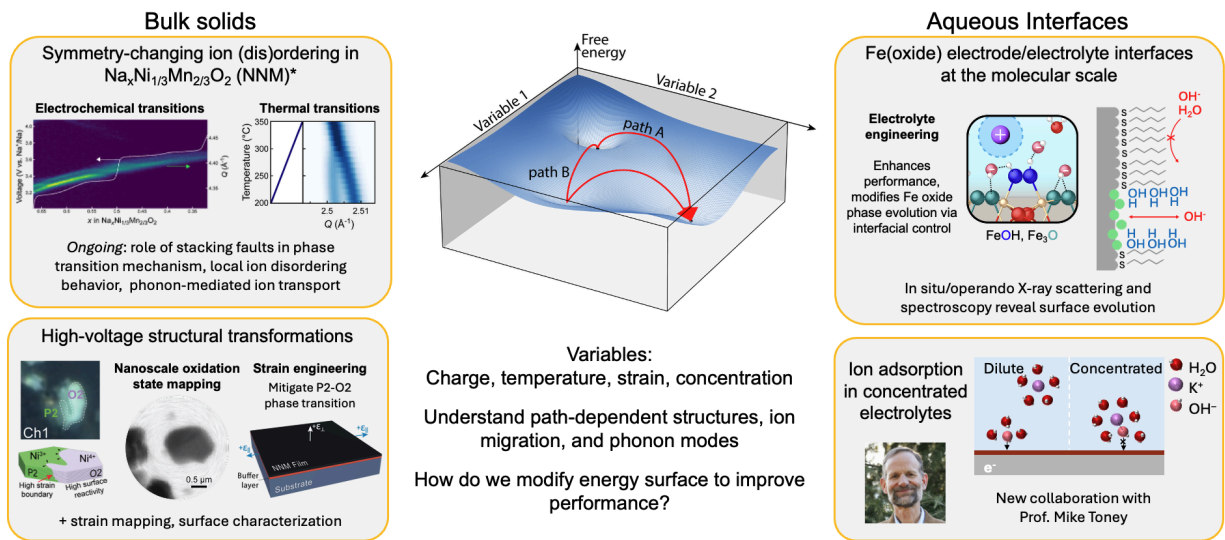
Multimodal characterization of aqueous batteries, catalysts, and devices



Point of Contact:

- Angel Burgos (aburgos0@stanford.edu)

Phase transformations (Iron aqueous anodes + Na-ion cathodes):



*D. Edelman, K. Harmon, W. Chueh, et al. JACS (2026).

kharmon@stanford.edu

Phase transition dynamics in Na-ion cathodes

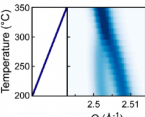


Fundamental properties of continuous & first-order transitions

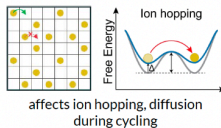
Ion (dis)ordering & lattice symmetry transitions

Continuous = less strain = less degradation

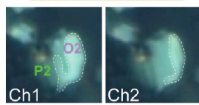
X-ray diffraction



Na-ion (dis)ordering



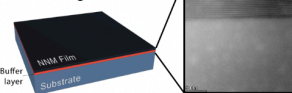
Heterogeneity and degradation



Phase heterogeneity → defects → degradation

Thin film electrode strain engineering

Modify phase transition energetics



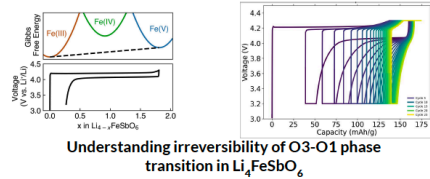
Point of Contact:

- Katherine Harmon (kharmon@stanford.edu)

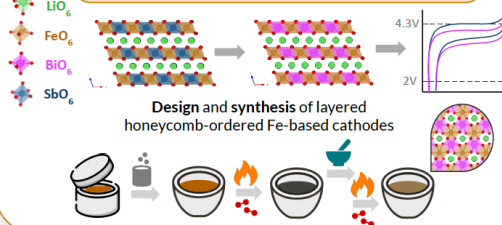
Iron- and sodium-containing cathodes:

Redox dynamics in Earth-abundant and high-voltage cathodes

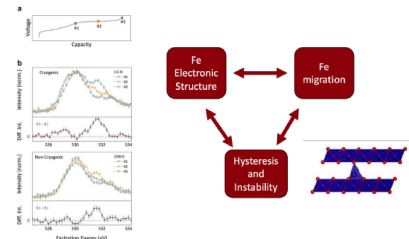
Understanding phase evolution of Fe^{III/IV} redox



Expanding the library of Fe^{III/IV} redox materials



Capturing metastable O and Fe^{III/IV} redox dynamics

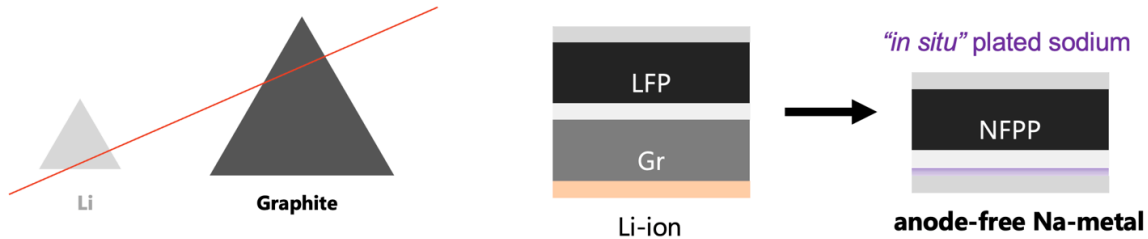


Point of Contact:

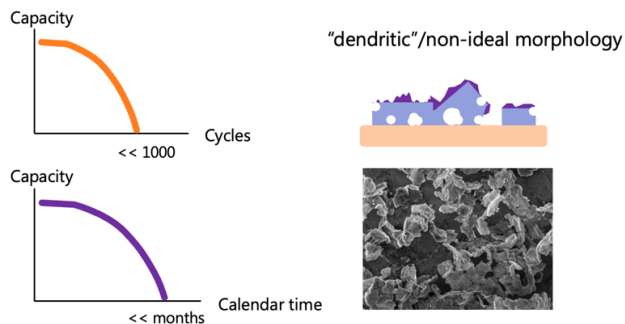
- Edward Mu (edwardmu@stanford.edu)

Anode-free sodium metal configuration:

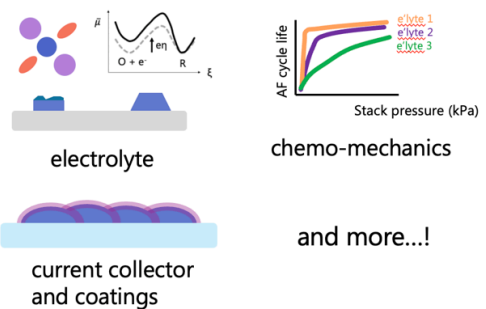
Anode-free sodium metal battery : a high-performance battery that does not rely on critical minerals



Need substantial improvement to cycle/calendar life



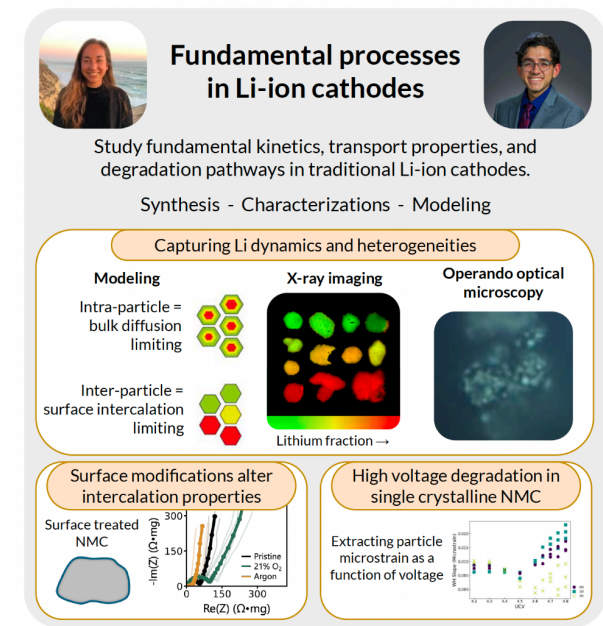
Research directions



Points of Contact:

- Raul Bodrogean (raulb@stanford.edu)
- Tony Dong (dtong@stanford.edu)

Fundamental processes in NMC cathodes:

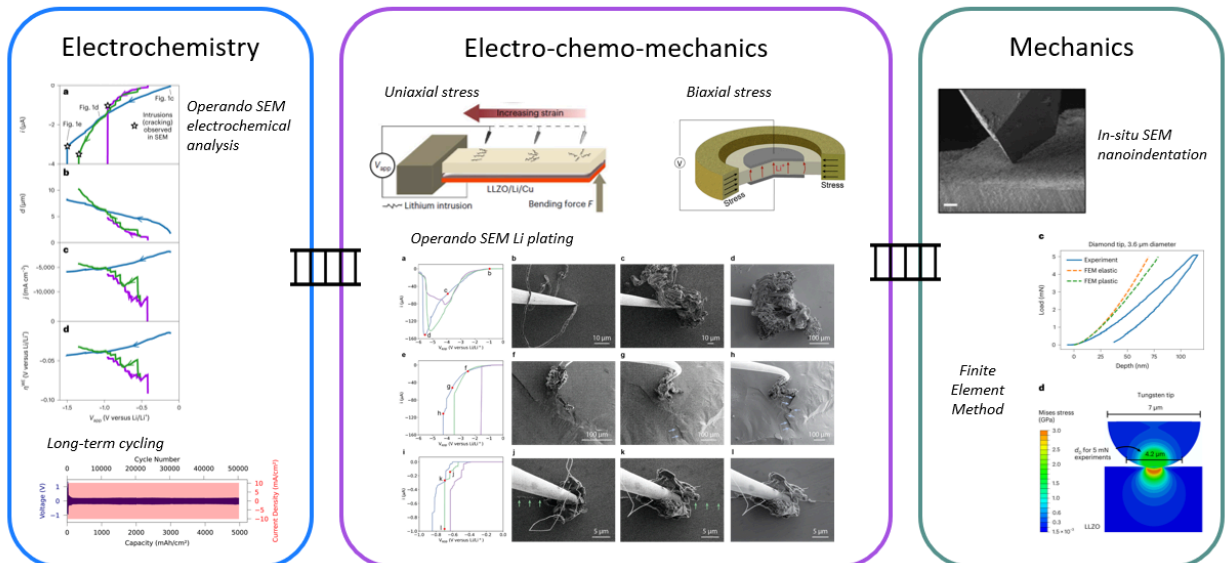


Point of Contact:

- Emma Choy (echoy@stanford.edu)

Electrochemomechanics in solid-state batteries:

Develop new experimental capabilities to investigate how coupling of electrochemistry and mechanics drive failure

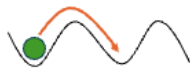


Point of Contact:

- Sam Lee (sslee921@stanford.edu)

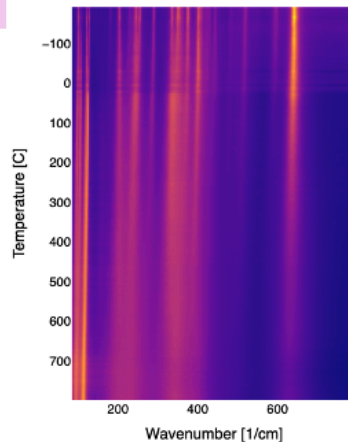
Ultrafast dynamics in solid-state batteries:

Simple model: Dilute limit, single ion hop



The figure consists of two parts. The top part is a schematic representation of the interaction of an ion with a vacancy in a dynamic lattice. It shows a potential energy landscape with a high energy ion site and a vacancy. The bottom part shows a 2D lattice of atoms with a vacancy and an ion moving towards it.

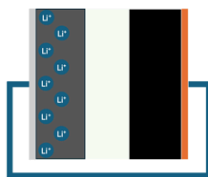
LLZO:
Strong phonon
broadening across
temperature linked to
ion hopping



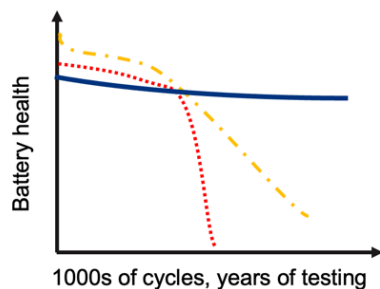
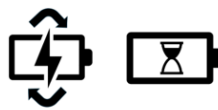
- Leah Narun (narunl@stanford.edu)
- Katherine Harmon (kharmon@stanford.edu)

Data team: Gain insights for accelerating battery design using large datasets

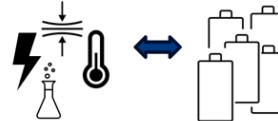
Cell construction



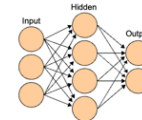
Operation



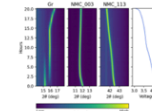
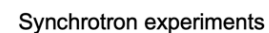
- ~600 battery testing channels



The diagram illustrates a microfluidic setup for separating particles. A central vertical channel labeled 'Separator' is flanked by two regions: 'Negative particle' (orange) on the left and 'Positive particle' (blue) on the right. A 'Current collector' is located on the far left. The horizontal distances from the left boundary to the center of the negative particle region, the separator, and the positive particle region are labeled L_n , L_s , and L_p respectively. A velocity vector v is shown at the bottom left, pointing to the right.



X-ray CT

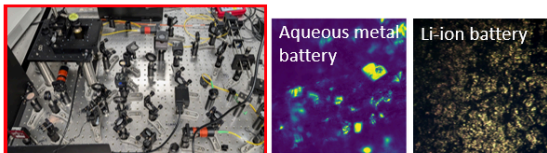


- Aki Takahashi (aktak@stanford.edu)

Optical Microscopy:

AI-Accelerated High Throughput Imaging of Batteries Under Operation and Aging – Kyle Frohna, frohnak@stanford.edu

1

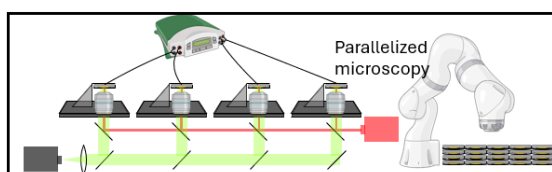


Current setup

2



3



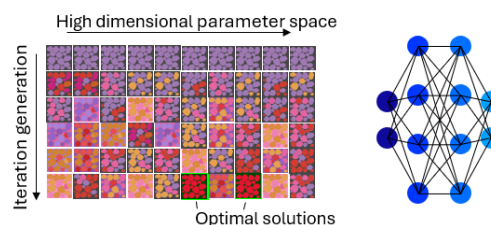
Co-supervised:

Chueh, MSE



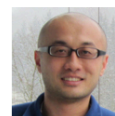
Congreve, EE

4



Collaboration:

Tzeng, SLAC



Song, EE

Point of Contact:

- Kyle Frohna (frohnak@stanford.edu)

7. Social Events

In addition to research-focused discussions, we feel that prospective students should have a chance to meet group members in more informal environments. To this end, we welcome you to join us at our weekly Group Lunch every Friday at 12:30 PM in front of Durand.

8. FAQs

Below we have listed some typical questions about the Chueh Lab and its structure. If you have additional questions, reach out to the general points of contact or speak to any current member!

Am I competing against other students? Are there a limited number of available spots for first-years?

- The short answer is: No! The longer answer is: Definitely not! In fact, we encourage prospective students to speak with each other and discuss ideas together as you go through this process. Prospective students join based on interest and group fit. You can join a specific project or come up with your own. Subgroups and areas are not “space limited” and you will not be prevented from joining because another student joined a subgroup you were interested in. As an example, three students have joined one subgroup in one year. Historically, Will has taken anywhere from 2-7 new students a year, with the average hovering around 3-5.

Can I discuss other things with Will during our meetings?

- Yes, and this is in fact encouraged! You should not limit your conversations to what is laid out above, and you should ask all the questions that you feel will help guide your decision in this process. This can even include questions about the recruitment process - while this can feel daunting, you are welcome to ask Will about where you stand or clarify any other uncertainties.

How is the lab structured and how are PhD students assigned projects?

- The lab consists of several subgroups working on different research areas. Each subgroup consists of postdocs and several graduate students. New students join a subgroup and develop their project based on their interests explored during their rotation.
- Some students begin projects that do not align with existing subgroups - you are therefore not limited in project options based on our existing research.

What sort of advising style does Will employ and how are new students mentored?

- Will will always be eager to provide guidance and advice, but is generally a hands-off advisor. Students learn to become independent researchers and develop their own ideas, but Will and other group members are extremely helpful in brainstorming and data analysis.
- First years meet with Will on a weekly-biweekly basis to assist in project framing and to help with the preparation of qualification exams. Senior group members minimally meet with Will once every quarter.
- New students join a subgroup and will be mentored by one or more postdocs and other senior graduate students in that subgroup. The group possesses expertise in a wide range of research areas and characterization techniques. Cross-collaboration is greatly encouraged, and students can expect to receive guidance from other group members.
- Our informal advice: working with a senior student or postdoc whose mentorship style aligns with your needs is equally important to working on research that inspires you - many times students will choose a mentor *before* joining a subgroup because of this. The research mentor will likely be someone in your subgroup/area-of-interest who can provide focused research guidance and advice as outlined above. You can also ask anyone in the group about more informal subjects, such as navigating meetings with Will, managing your workload, and adjusting to graduate school.
- The “buddy” system: This is a way for first year students to get extra support for non-research related topics, for example, what is the best way to contact Will? Who's the best person to talk to about ____? Why does the group do ____ in this way? etc... This ideally would be someone outside of your subgroup so you can get to know more people and don't get too silo'ed talking to the same people all the time.

Where do students typically go after graduating from the group?

- Group alumni end up in a variety of roles, including: academia, industry, startups (both as employees and founders), national labs, and more. Our current distribution is in fact almost evenly split between alumni who are in education/research positions and those in industrial positions.

Are there expectations in terms of work hours, time spent in the lab and progress? What is the policy on vacation time?

- Work hours are fairly flexible and there is no rigorous expectation for time spent in the lab. The group tries to maintain a healthy work-life balance with an emphasis on well

thought out experiments rather than long hours at the bench. However, students are strongly encouraged to spend time in the office space and interact with other group members (in the absence of a global pandemic).

- While notification of planned vacations should be provided to the group via our internal calendar system, there is no strict approval process for taking time off from lab work. The only advice is that you maximize your productivity on your project. Taking time away from lab is vital to maintaining mental health, creativity, and productivity as a researcher.

What is the lab culture in the group?

- There are several facets to our group culture. Scientifically, we focus on well-planned and rigorous studies, with an emphasis on detailed characterization of industrially relevant systems. We place a strong emphasis on collaboration, both among subgroups and in partnerships with groups both at Stanford and other universities. Overall, we tend to be quite open with our work, and group members end up being part of or assisting with multiple projects in our group.
- We try to be a very sociable group. Being a larger sized group on campus, our fun committee holds social events to engage group members. These include going out to dinner, going for hikes, or doing karaoke. Annually we also go on a retreat that typically involves some hiking, games and cooking together. And every Friday after group meeting, we provide food for group lunch.
- Our group has a strong focus on outreach, equity and inclusion. We have an equity and inclusion committee (EIC) focused on providing group programming for multicultural learning and improving the inclusivity of group-wide practices. A strong emphasis is placed on mentorship as well, and most students are expected to mentor fellow PhD students, as well as masters, undergraduate or high school students, in the lab during their PhD. (*This also means more senior PhD students and postdocs will be eager to mentor you!*)
- We do our best to accommodate people's allergies, dietary restrictions, and health needs (such as through masking). We aim to make the Chueh Group a safe and welcoming environment where everyone is able to do their best science.

How many students does the group typically take each year and how are students funded?

- The number of students varies each year. Will (as well as group members) look for creative and engaged students, so we aim to focus on recruiting those who bring motivation and a diversity of background and thought, rather than on recruiting a certain number. Historically, Will has taken anywhere from 2-7 new students a year.
- Funding and potential for co-advising also may determine how many students are recruited each year. Funding may come from a student's own fellowships (e.g. NSF, NDSEG, SGF), a corporate or federal grant, or a combination of the two.

Does it matter if I am out of the department now or if I didn't major in MatSci during undergrad?

- Nope! We value a diversity of backgrounds in education. We have PhD students from the Chemistry, Materials Science, Energy Science and Engineering, and Mechanical Engineering departments currently in our group, and are open to anyone who is interested and comes from a related science/engineering field!
- Furthermore - students in our lab come from an even greater diversity of undergraduate backgrounds, including chemistry, energy science & engineering, mechanical engineering, chemical engineering, electrical engineering, physics, and many more!