



# ASDRP

Aspiring Scholars Directed Research Program

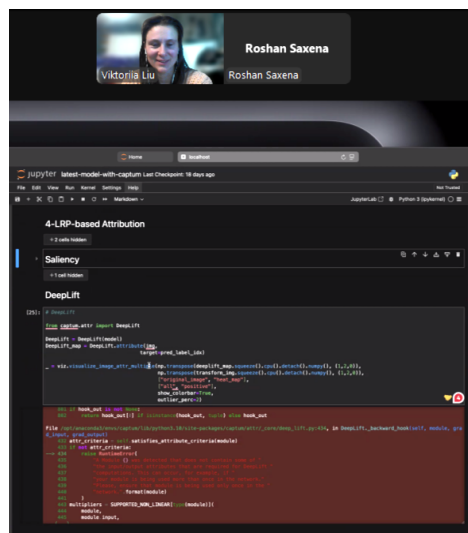
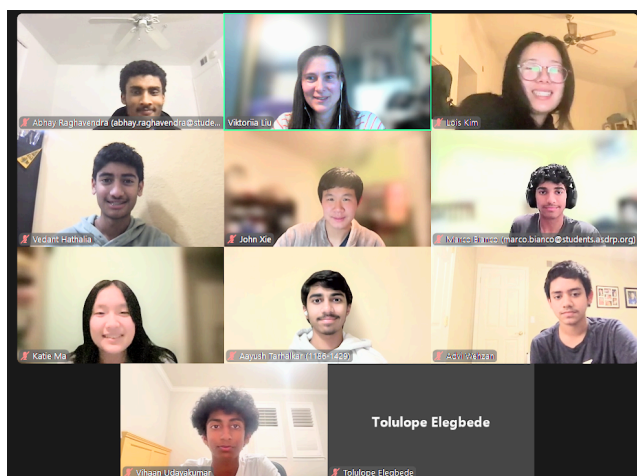
# [NewsBytes]

## Week of February 22-28, 2025

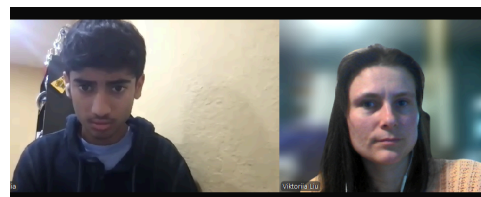
### Announcements, Shoutouts, and Accolades

#### Dr. Viktoriia Liu and her Student Research Teams are starting strong in Spring 2025

[Dr. Viktoriia Liu leads research projects](#) that are at the forefront of groundbreaking research, seamlessly combining the realms of machine learning, physical chemistry, deep learning, biochemistry, molecular modeling, and virtual/augmented reality. The Liu Lab is dedicated to pushing the boundaries of scientific innovation and solving complex challenges at the intersection of these diverse fields. With a passion for discovery and a commitment to excellence, Dr. Liu strives to unlock new possibilities, unravel mysteries, and revolutionize the way people understand and interact with the world.



Her Spring 2025 student researchers are working on various projects including: “Interpretable CNN’s for Pneumonia Detection using Captum Library”, “Augmented Reality Molecular Viewer with Speech Recognition”, “Application of Layer-wise Relevance Propagation (LRP) to a Custom ML Model for Cancer and Pneumonia Detection from X-Ray Images”, “Mobile Application for Early Detection of Pneumonia and Tuberculosis Using Advanced Image Analysis”, “Convolutional Neural Network Model to Determine the Location of Microvasculature Structures (Blood Vessels) within Human Kidney Histology Slides” and “Super-resolution and Image Quality Enhancement Using a Generative Adversarial Network”.



Events schedule list is subject to change with or without notice. Please check the ASDRP website for the most up to date information.

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ASDRP is a production of Olive Children Foundation, a 501(c)(3) nonprofit organization in Fremont, California.

[\[Link to Public ASDRP Events Calendar\]](#)

## The Parent Portal

Take advantage of the resources available on the [ASDRP Parent Portal](#). One place to get access to: Event Calendar, Carpooling Information, Colloquia, Donating to ASDRP, Fireside Chat (bi-weekly), The Group Joining Process, Spring 2025 Parent Pre-work, Pre-work Canvas Link, Research 201 Information, Slack Code of Conduct and Joining Slack, Spring 2025 Student Pre-work and our YouTube Channel.

Check your email for the Parent Portal password.



Calendar

Carpooling to ASDRP

Colloquia

Donate to ASDRP

Fireside Chat

Group Joining

Spring 25 Parent Pre-Work

Pre-work Canvas Link

Research 201

Slack Code of Conduct

Spring 25 Student Pre-Work

Spring 25 Admit Packet

YouTube Channel

## ASDRP's Remote Research Teams, Outstanding PI's, Projects - One More Time!

*ASDRP has an incredible team of Principal Investigators whose laboratories are fully remote. Remote advisors offer an impressive array of research projects with students presenting during colloquia, attending and presenting at national and international research conferences, winning IEEE best presentation awards and much more! The Principal Investigators of our remote research teams include:*

### Marx AKI, PhD | Density Functional Theory / Quantum Mechanics | [marx.aki@asdrp.org](mailto:marx.aki@asdrp.org)

*Dr. Aki received his PhD from the Rensselaer Polytechnic Institute in Physics, and currently teaches at community colleges around the Bay Area. Dr. Aki's primary area of research is in using machine learning to identify ways to linearize density functional theory (DFT) calculations to understand electronic structure of novel nano and inorganic materials with unique physical properties. Link to Group Website: <https://sites.google.com/asdrp.org/aki>*

### Harman Brah, MD | Biophysics & Computational Biochemistry | [harman.brah@asdrp.org](mailto:harman.brah@asdrp.org)

*The Brah group at ASDRP uses computer modeling and simulations to develop next-generation small molecule therapeutics targeting cancer, Alzheimer's disease, obesity, and more. This is accomplished through high throughput virtual screening and molecular dynamics simulations. Link to Group Website: <https://sites.google.com/asdrp.org/brah>*

### Clinton Cunha, MS | Bioinformatics & Cancer Biology | [clinton.cunha@asdrp.org](mailto:clinton.cunha@asdrp.org)

*The Cunha lab is interested in applying heavy duty data analysis and bioinformatics towards understanding gene expression and regulation patterns in colorectal cancer cells as a means to informing the next questions in cancer therapeutics. Link to Group Website: <https://sites.google.com/asdrp.org/cunha>*

### Chris DeGrendele, PhD | Applied Physics | [chris.degrendele@asdrp.org](mailto:chris.degrendele@asdrp.org)

*The DeGrendele lab works on developing models for fluid dynamics that help to simulate challenging physical environments. We are looking for enthusiastic theoretical physicists and those interested in the intersection of applied mathematics and applied physics! Link to Group Website: <https://sites.google.com/asdrp.org/degrendele>*

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**Pragati Dhamale, MS | Machine learning & Artificial Intelligence | [pragati.dharmale@asdrp.org](mailto:pragati.dharmale@asdrp.org)**

Pragati Dharmale has 14 years of academia / industry research experience and received her M. Eng in Digital electronics and M.S. in computer science from Southern New Hampshire University, NH. Her research interest includes application of EEG analysis with machine learning (ML) and artificial intelligence (AI), as well as STEM based applications designed for Raspberry PI with Python programming. Link to Group Website: <https://sites.google.com/asdrp.org/dharmale>

**Robert Downing, MS | Data Science & Machine Learning | [robert.downing@asdrp.org](mailto:robert.downing@asdrp.org)**

Prof. Downing's group at ASDRP is a diverse and dynamic group of aspiring data scientists. We see data and machine learning as being central to everything from environmental analysis to neuroscience to decryption of medieval manuscripts to searching the night sky for potentially habitable exoplanets. Link to Group Website: <https://sites.google.com/asdrp.org/downing>

**Sahar Jahanikia, MS | Cognitive Science & Neuroinformatics | [sahar.jahanikia@asdrp.org](mailto:sahar.jahanikia@asdrp.org)**

The Jahanikia "neuro lab" at ASDRP embodies cross-disciplinary research in the fields of cognitive science, neuroimaging by fMRI, application development, bioinformatics, and neuroinformatics - using data and cognitive science to understand human behavior. Link to Group Website: [www.jneurolab.org](http://www.jneurolab.org)

**Prabin Lamichhane, MS | Mathematics, Data Science & Statistics | [prabin.lamichhane@asdrp.org](mailto:prabin.lamichhane@asdrp.org)**

Prabin is experienced in utilizing a diverse set of tools, including Python, R, and SQL, to analyze large datasets, identify patterns, and develop data-driven strategies. Outside of the professional sphere, Prabin is an advocate for and actively participates in data science communities, attends industry conferences, and contributes insights to open-source projects and informatics. Link to Group Website: <https://sites.google.com/asdrp.org/Lamichhane>

**Joseph Laurienzo, MS | Applied mathematics | [joseph.laurienzo@asdrp.org](mailto:joseph.laurienzo@asdrp.org)**

Mr. Laurienzo received his BS in math and physics and MS in applied math from Case Western Reserve University, along with a BA in Japanese, and has collaborated with the

University of Tokyo in condensed matter physics. Joseph's research interests include the application of novel mathematical techniques in the assessment of brain activity patterns and constructing cognitive and phenomenological models, as well as game theory, and research projects under his supervision will likewise embody this interdisciplinary spirit. Link to Group Website: <https://sites.google.com/asdrp.org/laurienzo>

**Viktoriiia Liu, PhD | Quantum Mechanics and Computer Science | [viktoriiia.liu@asdrp.org](mailto:viktoriiia.liu@asdrp.org)**

Dr. Liu received her PhD in physical chemistry from UC Riverside. Her lab at ASDRP works on using machine learning models to identify applications of multiple regression models and applied artificial intelligence for biological and biomedical applications, particularly focused on cancer detection and pathology detection. Link to Group Website: <https://sites.google.com/asdrp.org/liulab>

**Larry McMahan, MS, PhD | Quantum Mechanics & Computer Science | [larry.mcmahan@asdrp.org](mailto:larry.mcmahan@asdrp.org)**

Dr. McMahan's research group at ASDRP focuses on two main arenas of research - quantum mechanics (quantum tunneling and computing) and machine learning platforms that have predictive capabilities in understanding societal phenomena such as crime rates, COVID-19 rates, etc. Link to Group Website: <https://sites.google.com/asdrp.org/mcmahan>

**Phil Mui, PhD | Artificial Intelligence & Machine Learning | [phil.mui@asdrp.org](mailto:phil.mui@asdrp.org)**

Dr. Mui's research group at ASDRP actively works on a number of areas related to the role of intrinsic biases in artificial intelligence and machine learning algorithms and their impact on society - issues such as biases intrinsic in facial recognition, occupational demographics, and news aggregators. Group Website: <https://sites.google.com/asdrp.org/mui>

**Suresh Subramaniam, MS | Data Science | [suresh.subramaniam@asdrp.org](mailto:suresh.subramaniam@asdrp.org)**

The Subramaniam group at ASDRP works on a variety of real-world applications of data science, including understanding patterns in COVID-19 spread, the housing market, image analysis and facial feature / emotion recognition platforms. Link to Group Website: <https://sites.google.com/asdrp.org/subramania>

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## Research 101 and 201 are in FULL SWING!

*This weekend is our fifth week of running this semester's rendition of Research 101, our foundations course for first semester students, and Research 201, our next-level advanced research methodology seminar for second and third semester students. This week in Research 101, Michael Amadi covered the importance of both rigorous preparation and documentation of standard operating procedures (SOP's) and documentation of electronic data to ensure reproducible research results.*

*In Research 201, this week our course instructors Dr. Larry McMahan and Dr. Edward Njoo launched a new module extending the next set of learning objectives from last week's literature review workshop. This module, aimed at developing students' abilities to define and articulate the competitive landscape in a research area, and debate the merits of different solutions to a research question. The students learned about how to effectively dissect and construct statements of research innovation, as well as the role of graphical abstracts in summarizing key innovations made in a project. Finally, our course instructors provided practical advice on preparing specific aims and defining objectives of a research prospectus.*

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## Save the Date! ASDRP Research Expo & Symposium is March 22, 2025

*The **In Person** ASDRP Summer 2024 Semester Research Symposium and Expo showcases some of the original scientific findings of 1000+ high school student researchers who conducted research across 200+ projects in a wide array of STEM fields. Students come from throughout the Bay Area, across the U.S., and internationally! The Symposium features students presenting the research they completed throughout the Fall 2024 & Spring 2025 semester and during their participation in ASDRP.*

*The Research Symposium & Expo showcases the students' novel results to their peers, parents, community, and friends. Importantly, these scientific projects conducted by students are original research with cutting-edge results, completed on \$10M+ worth of donated research equipment with highly qualified research mentors, and are not traditional "science lab" projects whose results are known. This event is a premier opportunity for student researchers to be exposed to genuine research, scholarship, peer review, scientific reading and writing, and scientific presentation at a young age before college. At the completion of the Symposium, the students will be able to leverage their own published works in demonstrating their competitive advantage as they prepare to matriculate to college. We invite you to join us in the beginning of a wonderful journey for these young scientists. Please come, view research posters, ask the students questions, listen to oral presentations, support these great kids, celebrate their accomplishments, and have fun!*

*The event is held at [Mission College](#) in Santa Clara. Mission College continues to be an incredible partner and allows the ASDRP community to utilize the [Gillmor Center](#). The Gillmor Center is **118,000 square foot** three-story interdisciplinary classroom facility. A big thank you to [Dr. Omar Murillo](#), [Clement Lam](#), and [Brian Shively](#) who make our partnership with Mission College possible.*

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## On the Horizon: Upcoming Events

**Saturday, February 22, 2025 @ 10:00 - 11:30 AM**

### **February Parent Coffee & Behind the Scenes**

Parents you are invited to come and enjoy some morning coffee, tea and small bites with the ASDRP advisors and leadership team. We will be sharing more about what is happening at ASDRP and a look behind the scenes. In addition, we will share a few highlights of the five year strategic plan.

[RSVP Here](#)

**Saturday, February 22, 2025 @ 10:00 - 11:30 AM**

### **Research 101, Module 5: "Protocol Development and Reproducibility in Science", Mr. Michael Amadi**

Research 101 is mandatory for all first semester students, and covers the fundamentals of research methodology, best practices, and basic statistics and writing skills. Module 5/Week 5, Mr. Amadi on how to develop the proper protocols and the ever important reproducibility in science. Discussions will center around how, why and practical examples will be provided during the session.

First Semester Students are required to join us at [10:00 AM PDT via Zoom](#).

**Saturday, February 22, 2025 @ 12:00 - 1:30 PM**

### **Research 201, Week 5, Module 2 / Lecture 2: "How to Write A Research Proposal", faculty-led**

Module 2, Week 5 of Research 201 kicks off two weeks of lecture and practical application of constructing a research proposal. The next two weeks are designed to bridge the span between identifying the background information to making the next jump towards forward contributions in research is a core competency. The faculty will cover preparing a summary of prior work in a field and constructing a forward summary, bridging prior to present work, Identifying the competitive landscape and audience, constructing specific aims and scope of research in a broader study, Scientific reasoning from competitive landscape + "the why"

All second and third semester students are required to join us at [noon on Zoom](#).

**Saturday, February 22, 2025 @ 7:00 - 8:00 PM**

### **Spring School Year Seminar: The Logic of Chemical Synthesis (Dr. Njoo) @ Seminar Room**

This seminar meets on Saturday nights, with a focus on retrosynthetic analysis, strategies in atom- and step-economical total synthesis of natural products, and mechanistic study of named reactions. In person only, open to all students.

**Monday, February 24, 2025 4:00 - 5:00 PM**

### **SciFinder License Distribution and Training (In Person Only)**

"CAS SciFinder is the world's most current and relied on source for chemical substance information. Make research decisions that get results with a single solution that combines the world's largest source of scientific knowledge with powerful search and analysis tools."

**Tuesday, February 25, 2025 @ 7:00 - 8:30 PM**

### **Colloquia held online via Zoom (Weekly)**

The [Njoo lab](#) will be presenting "Synthesis and anticancer properties of triacetate and acetone analogs of Proscillaridin A". Lekhya Menta, California High School '25 & Shreya Somani, Lynnbrook High School, '26; will be our presenters. Join us every Tuesday at 7:00 PM on Zoom for the ASDRP student researchers Colloquia. All are invited and student researchers need to attend.

**Zoom Link:** <https://us06web.zoom.us/j/83346956991?pwd=STJ1SGFUK1VtMjdNRThLKy9KdHNlZz09>

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**Wednesday, February 26, 2025 @ 7:15 - 9:30 PM**

**Spring 2025 In Person Safety Training - For Registered Students ONLY**

**Phase 2 (in-person walkthrough):** Facility walkthrough and training with either Dr. Pazzi or Dr. Kushnerov. Must have Phase 1 completed satisfactorily, including a 100% score on the final safety exam. You must have completed the online safety training modules in Canvas and registered in advance for the training. Also posted on the ASDRP Events Calendar which can be found in the Student Portal and Parent Portal.

**Friday, February 28, 2025 @ 3:30 - 5:30 PM**

**Spring 2025 In Person Safety Training - For Registered Students ONLY**

**Phase 2 (in-person walkthrough):** Facility walkthrough and training with either Dr. Pazzi or Dr. Kushnerov. Must have Phase 1 completed satisfactorily, including a 100% score on the final safety exam. You must have completed the online safety training modules in Canvas and registered in advance for the training.

**Friday, February 28, 2025 @ 5:00 - 6:00 PM**

**Computational Resources Training, Module 4: “Version Control; Statistical Analysis”, Mr. Dennis Liu**

The training occurs every week for five weeks and is mandatory for all first semester students in CSE or who recently transferred to research groups who use ASDRP computing resources for research.

Join us on [Google Meet](#).

**Friday, February 28, 2025 @ 6:00 - 7:00 PM**

**Spring 2025 School Year Seminar: "On the Importance of Data Curation" Prof. Robert Downing**

With the increasing public access to [very] large datasets, for all purposes, it is become imperative that someone in the inbound data stream has to make decisions, some of them very important, on the \*exact\* low-level modifications that have to be made. This is further compounded by external attempts to import data without it being validated. Here, we'll discuss how to perform this critical task, & why its uninteresting name guarantees there will be opportunities for anyone that can perform these tasks.

Join us on [Google Meet](#).

**Saturday, March 1, 2025 @ 10:00 - 11:30 AM**

**Research 101, Week 6/Module 6: “Good Science: Bias, Error, and Statistical Analysis”, Mr. Clinton Cunha**

Research 101 is mandatory for all first semester students, and covers the fundamentals of research methodology, best practices, and basic statistics and writing skills. Module 6/Week 6, Mr. Cunha will cover “Bias” as it refers to systematic errors that can skew research outcomes, leading to conclusions that deviate from the truth; “Statistical Analysis & Error” occurs when there’s a discrepancy between the estimated values and the true population parameters. Understanding these practices addresses issues related to bias and statistical errors, leading to more trustworthy research and scientific outcomes. Discussions will center around how, why and practical examples will be provided during the session. First Semester Students are required to join us at [10:00 AM PDT via Zoom](#).

**Saturday, March 1, 2025 @ 12:00 - 1:30 PM**

**Research 201, Week 6, Module 2 / Practical 2: “How to Write A Research Proposal”, faculty-led**

Module 2, Week 6 of Research 201 finished up with the practical application of constructing a research proposal. The second installation of this two week long module will train students on developing and preparing an NSF-style mini-“proposal”. This “proposal” might be a new direction of their PI’s research, or it may not necessarily be a new research topic; rather, this “proposal” will summarize the research aims that they are already committed to within their research group. All second and third semester students are required to join us at [noon on Zoom](#).

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**Saturday, March 1, 2025 @ 5:00 - 7:00 PM**

**Spring 2025 Guest Speaker: Dr. Madhulika Jupelli, Pfizer:**  
**““Delivering a Functional Cure in a Pill for Sickle Cell Disease”:** Sickle cell disease (SCD), also known as sickle cell anemia, refers to a group of inherited disorders that impact hemoglobin, the primary protein responsible for oxygen transport in red blood cells. In healthy individuals, red blood cells are flexible and disc-shaped, allowing them to flow easily through blood vessels. However, in SCD, the polymerization of hemoglobin S (HbS) leads to the formation of rigid, non-deformable sickle-shaped red blood cells. This loss of deformability, along with sickling and irreversible membrane damage, causes abnormal blood flow and increased blood viscosity. These factors contribute to Vaso-occlusion and a range of SCD-related complications, including pain, stroke, renal failure, cerebral infarction, lung problems, and infections. GBT021601 (generic name Osivelotor) is a second-generation anti-polymerization and anti-sickling agent currently in Phase III clinical trials for the treatment of SCD. This presentation will provide an overview of the drug's development, tracing its evolution from discovery through preclinical studies to its current status as a clinical candidate. In addition, we will examine data from in-vitro, ex-vivo, and in-vivo (animal) studies, demonstrating improvements in red blood cell biology, oxygen delivery, red blood cell membrane stability, and overall disease pathophysiology. The final portion of the talk will focus on the advantages of GBT021601 in reducing Vaso-occlusive crises, improving quality of life, and addressing the multifaceted nature of SCD.



**Madhulika Jupelli, MS, PhD**

**Where?**

**5:00 PM @ Seminar Room  
Reception and Q&A Afterwards for  
In-Person Attendees**

**Saturday, March 1, 2025 @ 7:00 - 8:00 PM**

**Spring School Year Seminar: The Logic of Chemical Synthesis (Dr. Njoo) @ Seminar Room**

*This seminar meets on Saturday nights, with a focus on retrosynthetic analysis, strategies in atom- and step-economical total synthesis of natural products, and mechanistic study of named reactions. In person only, open to all students.*

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[NewsBytes]

## End Note

*A pic of our amazing student researchers with our December 2024 Guest Speaker, Dr. Noah Burns, Associate Professor, Department of Chemistry, Stanford University.*



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