ASDRP
Aspiring Scholars Directed Research Program

[NewsBytes]

Week of February 15-21, 2025

Announcements, Shoutouts, and Accolades

Ardelyx Donates event more Equipment and Consumables

Our commitment to keeping our lab expenditures at a minimum continues with additional donations received and Ardelyx (Fremont) this week. Edward Njoo and Akira Yamamoto identified equipment, laboratory supplies, cold storage units, dry storage units and much more to enhance the wet and dry labs on campus. Dr. Njoo has established an extensive network of research labs and professionals who let us know when donations of all kinds are available. On most occasions, the donations require the ASDRP team to act very quickly and pick up most often occurs on the same day. Thank you to Ardelyx! This element to our laboratory operations is a major operational undertaking that has enabled us as a nonprofit to provide research supplies and opportunities to our students.

Welcome Dr. Harrison Rahn, and welcome back, Dr. Phil Mui!

We are excited to welcome Dr. Harrison Rahn to the faculty at ASDRP, and we are excited to have Dr. Phil Mui back in the house! Earlier this morning, the Admin team released a communication with a little bit of information on Dr. Rahn and Dr. Mui, their academic and industrial backgrounds, and their research interests. Dr. Rahn received his PhD in chemistry from Stanford, and MS and BS degrees from Tulane University, and comes to ASDRP with expertise in supramolecular chemistry, drug delivery, and organic synthesis of guanidinium-based molecular transporters, and will be recruiting new students in his lab to work on the interface of organic synthesis, drug delivery, and supramolecular chemistry.

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ASDRP's Remote Research Teams - Outstanding PI's and Projects!

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 Akl, PhD | Density Functional Theory / Quantum Mechanics | marx.akl@asdrp.org
Dr. Akl received his PhD from the Rensselaer Polytechnic Institute in Physics, and currently teaches at community colleges around the Bay Area. Dr. Akl'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/akl

Harman Brah, MD | Biophysics & Computational Biochemistry | 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
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
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

Pragati Dhamale, MS | Machine learning & Artificial Intelligence | 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
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
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

Prabin Lamichhane, MS | Mathematics, Data Science & Statistics | 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
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

Viktoriia Liu, PhD | Quantum Mechanics and Computer Science | viktoriia.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
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
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
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/subramaniam

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Research 101 and 201 are in FULL SWING!

This weekend is our fourth 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. In Research 101, Mr. Michael Amadi, one of our course instructors, started with the question of "what is plagiarism and intellectual property" - in this module, we explained to students that science and research is littered with plagiarism and intellectual property theft. The module included practical examples and group work to help identify plagiarism, ChatGPT and AI created references, etc. Understanding what is original research and the data associated with each study is a key aspect of all research.
In Research 201, our department leads Dr. Larry McMahan and Dr. Edward Njoo this week continued Module 1 a new module with a workshop on developing rigorous, substantive, and specific background literature searches related to one's area of research. Our advisors facilitated the conversations by leading breakout room discussion and the practical workshop. Participating advisors included Dr. Viktoriia Liu, Mr. Cunha, Dr. Starostina, Dr. McMahan and Dr. Njoo. Please remind your students to attend and participate!

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 high school students 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 15, 2025 @ 10:00 - 11:30 AM

Research 101, Module 4: "Plagiarism and Intellectual Property", 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 4/Week 4, Mr. Cunha will be sharing a lesson on practical ways to ensure you avoid common research pitfalls that include plagiarism and intellectual property theft. 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 15, 2025 @ 12:00 - 1:30 PM

Research 201, Week 4, Module 1 / Practical 1: "Workshop on developing rigorous, substantive, and specific background literature searches related to one's area of research", faculty-led

Week 4 of Research 201, our training course mandatory for all second and third semester, has its fourth practical session. Week 4 module will be a workshop dedicated to developing practical researcher skills on rigorous, substantive, and specific background literature searches related to one's area of research. All second and third semester students are required to join us at noon on Zoom.

Saturday, February 15, 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.

Saturday, February 15, 2025 @ 4:00 - 6:00 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.*

Tuesday February 18, 2025 @ 7:00 - 8:30 PM

Colloquia held online via Zoom

Join us every Tuesday at 7:00 PM on Zoom for the ASDRP student researchers Colloquia. This week we'll have presentations by the McMahan Lab "Using Quantum Dots to improve the reliability of quantum key distribution systems" and the Njoo Lab "Synthesis and anticancer properties of triacetate and acetonide analogs of Proscillaridin A". Come and listen to our student researchers presenter their latest findings, ask questions and join in the research discussions. All are invited and student researchers need to attend.

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

Friday, February 21, 2025 @ 3:30 - 5:30 PM

Spring 2025 In Person Safety Training - For Registered Students ONLY

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Friday, February 21, 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 21, 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, 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.

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