Labs of Interest;

LSI-01 Single-Nucleus transcriptome database 3/15/24

OPEN 2/15

- Related to work at Mount Sinai, but mostly programming and execution
- $500/wk

PHY-01
OPEN 2/15
Biophysics: Custom Projects in Experiment and Computational Modeling
3/15/24

- Custom self-directed project about physics, computing and biology, make own research, offers many slots
- unpaid

ACEE-03 Large Language Model Applications in Environmental Sustainability 3/15/24

OPEN 2/15

- unpaid

ACEE-01 Development Piezoelectric Soft Robots 3/15/24
OPEN 2/15

- Develop control strategy, unpaid

ACEE-02 Development of a Bio-Inspired Soft Robot 3/15/24
OPEN 2/15

- Work alongside grad students to develop something, lead independent initiatives

ECE-01 Fast hardware for multiplexed quantum sensing 3/15/24

OPEN 2/15	- Implementation, uses python, work on quantum computers - Build small things (logic things?) to deploy on quantum computers - $600/wk	
ECE-02 OPEN 2/15	Safe Robotics for Coral Reefs Conservation: Using Machine Learning to Navigate Ocean Currents - Implement ML on a supercomputer, run digital simulations	3/15/24
ECE-04 OPEN 2/15	Sensing and Classification using Silicon Photonic Neural Network Chips	

All 250 words

What do you hope to get out of a research experience at Princeton?

As someone interested in and with an aptitude for technology and the sciences, a research experience at Princeton will allow me to further explore those areas and make an impact. As somebody passionate about computer science and the life sciences, I have spent a significant amount of time learning and reading about discoveries made in the field. A research experience at Princeton is the next step: to not only learn from the discipline, but to use the knowledge I have learned to expand the discipline. I have displayed my aptitude for math and technology through my AIME qualification, USACO Silver, leading my FTC Robotics team to among the best in the city and multiple wins at regional math competitions and hackathons. I have pursued that passion through developing projects like a machine learning model to evaluate art prices and an online platform to crowdsource lexicons of endangered languages. From earning the certificate of Distinguished Research Scholar from the International Research Olympiad to writing

my own scientific paper (*Single Cell Transcriptomics Reveal Genomic Indicators of Liver Fibrosis*), I have also proven my aptitude for research. Now, I aim to use my strong . Working in PHY-01 (Biophysics: Custom Projects in Experiment and Computational Modeling) I can further my understanding of the intersection of biology and technology, bridging 2 areas of interest. Working in ECE-01 (Fast hardware for multiplexed quantum sensing), I would have the opportunity to apply my programming and technology expertise to the next generation of computing, with cutting edge tools. Research at Princeton would give me the opportunity to work in facilities with access to state of the art technology and superlative resources. As someone interested in pursuing research in university and beyond, I think a research experience at Princeton would be transformative.

Describe What You Have Learned From Previous Science Classes, Laboratory Or Research Experience.

My broad array of science experiences, from learning about science in school and other programs, to conducting original research, has given me many lenses through which I view science. Initially, as a student, science was truth. From classes at school to advanced courses exploring everything from number theory to aeronautical engineering, my experience as a student is foundational to my understanding of science. These experiences taught me formulas, theories and models as immutable facts. However, in my work as a researcher at a lab, my view of science fundamentally changed. Working as a bioinformatics intern in a pediatric hepatology lab at the Icahn School of Medicine, I was exposed to the vast unknown. From crafting a hypothesis by applying my technical skills, to testing it with zebrafish models to discussing and defending it in lab meetings, I was exposed to the process of discovery. I later used those skills in other fields, such as designing a study to investigate how females and minorities use park space in New York City, which has been shared with parks citywide. Although I have always loved science, the thrill of answering an unanswered question - making a meaningful contribution to a field - is what draws me to science today. I aim to make that contribution using the skills I have learned throughout my scientific journey: not only a thorough understanding of various fields in science, but also practical laboratory experience, as well as the skills of scientific inquiry required to pursue meaningful research.

What Do You Hope To Contribute To A Research Team?

As a student with experience across fields, I hope to apply my strong technical and communication skills to the field of research. As an experienced programmer, I hope to contribute my skills to a research team. I have shown aptitude in these areas through national awards, such as USACO Silver, leading my FTC Robotics team to

among the best in the city, and multiple wins in local hackathons and coding competitions. I have also applied these skills in research settings: My former biology research, for example, stemmed from an application of my programming and statistical analysis skills to view sugar metabolism in the liver differently. Furthermore, while working at a lab at the Icahn School of Medicine, I learned invaluable skills of formulating, refining, testing and justifying a hypothesis that are foundational to any form of scientific research. I have displayed aptitude in this area not only by being the first author of a paper (*Single Cell Transcriptomics Reveal Genomic Indicators of Liver Fibrosis*) on my work, but also by being a Distinguished Research Scholar of the International Research Olympiad. Using these two highly valuable skill sets, I hope to contribute new ideas to a research team - using my technical background to find areas of research and using my skills of communication to refine that work.

What Are Your Career Interests And Plans For College?

I am, of course, planning on going to college, and, despite not having decided what field to venture into, I know I want to pursue scientific research. My interests are broad, stretching from biology to abstract mathematics, and I find each interesting in their own right. However, I feel that the joy of discovery, the goal of research, is dear to my heart. Princeton's Laboratory Learning Program would allow me to pursue this goal, while gaining practical laboratory experience and offer more clarity on what field I would like to pursue in college and beyond.

Availability

I am available for the entirety of the summer to work full time. I can work beginning 6/14 and my school resumes in early September. I would love to have the opportunity to participate in Princeton's Laboratory Learning Program!