# Andrew G. Sharo

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# **Education**

2016-2021	University of California, Berkeley, Berkeley, CA
	Ph.D. in Biophysics, Designated Emphasis in Computational and Genomic Biology
	Relevant coursework: Biostatistics, Genomics, Machine Learning, Data Visualization
2012-2016	Princeton University, Princeton, NJ
	A.B. in Physics with Honors, Certificate in Biophysics
	Relevant coursework: Biological Physics, Logic in Quantitative Biology, Laboratory
	in Molecular Biology, Quantitative Cell Biology, Algorithms and Data Structures in
	CS, Advanced Program Design

# Research Experience

2022-present	NSF Postdoctoral Fellow
	Beth Shapiro Group, UC Santa Cruz, Santa Cruz, CA
	Developing supervised learning method to prioritize functional variants in species of conservation interest. Investigating hatchery trout introgression into native California steelhead trout populations to identify ancestry-informative genomic markers.
2016-2021	Ph.D. Candidate
	Steven Brenner Group, UC Berkeley, Berkeley, CA
	Developed supervised learning method to predict the pathogenicity of germline structural variants. Analyzed short-read, long-read, and optical mapping sequencing data for disease gene discovery.
2015-2016	Undergraduate Senior Thesis Student
	<b>Bonnie Bassler and Ned Wingreen Groups</b> , Princeton University, Princeton, NJ Imaged <i>V. cholerae</i> biofilms at single-cell resolution using confocal microscopy. Simulated biofilm growth with agent-based model.
2015	Undergraduate Research Assistant
	Howard Stone Group, Princeton University, Princeton, NJ Modeled nutrient diffusion as a public goods dilemma in bacterial biofilms.
2014-2015	Undergraduate Junior Thesis Student
	<b>Robert Austin Group</b> , Princeton University, Princeton, NJ Derived novel equation for the growth variance of a mutant bacterial population.
2014	Visiting Researcher
	<b>Eberhard Bodenschatz Group</b> , Max Planck Institute DS, Göttingen, Germany Visualized traveling chemotactic waves of <i>D. discoideum</i> using dark field microscopy.
2013	Lab Assistant
	Marija Drndic Group, University of Pennsylvania, Philadelphia, PA
	Developed new manufacturing process for silicon-nitride nanopores for sequencing.

#### Awards & Fellowships

2022-present	NSF Postdoctoral Research Fellowship in Biology
2020	Abstract selected for "Reviewers' Choice" and Poster Talk at ASHG 2020 Awarded to the top $\sim 1\%$ of posters.
2019	Finalist at SVAI hackathon "Undiagnosed-1" held at Invitae, San Francisco, CA
2018-2021	NSF Graduate Research Fellowship
2016-2017	Molecular Biophysics Training Grant (NIH T32) Fellow, UC Berkeley
2016	Allen G. Shenstone Prize in Physics, Department of Physics, Princeton University Awarded for excellence in independent research and academic work.
2015	Kusaka Memorial Prize in Physics, Department of Physics, Princeton University Awarded for excellence in independent research and academic work.
2015	Treiman Fellow, Department of Physics, Princeton University Fully funded summer research and housing at Princeton University.
2015	25 under 25, awarded by Princeton Science Journal Innovation Awarded to Princeton University Physics Competition for global education efforts.
2014	International Internship Scholar from Princeton University Fully funded research, travel, stipend, and housing at Max Planck Institute for Dynamics and Self-Organization, Göttingen, Germany.
2014	Princeton University Art of Science Finalist Campus-wide science photography contest.
2010	Eagle Scout, Troop 181 of Paoli, PA Worked with local bookseller and parish to donate high-interest reading books to first grade class at St. Malachy School in North Philadelphia, PA.

# Scholarly Publications

- 7. Johnson JA, Novak B, Athrey G, **Sharo AG**, et al. 2023. Phylogenomics of the extinct Heath Hen provides support for sex-biased introgression among extant prairie grouse. *under review at Molecular Phylogenetics and Evolution*.
- 6. **Sharo AG**, Zou Y, Adhikari AN, Brenner SE. 2023. ClinVar and HGMD genomic variant classification accuracy has improved over time, as measured by implied disease burden. *Genome Medicine* 15:1. doi:10.1186/s13073-023-01199-y
- Sertori R, Lin J, Martinez E, Rana S, Sharo A, et al. 2022. Investigation of the causal etiology in a patient with T-B+NK+ immunodeficiency. *Frontiers in Immunology* 13:928252. doi:10.3389/fimmu.2022.928252
- 4. **Sharo AG**, Hu Z, Brenner SE. 2022. StrVCTVRE: A supervised learning method to predict the pathogenicity of human structural variants. *American Journal of Human Genetics 109*:195-209. doi:10.1016/j.ajhg.2021.12.007
- 3. Shieh JT, [...], **Sharo AG**, et al. 2021. Application of full genome analysis to diagnose rare monogenic disorders. *npj Genomic Medicine* 6:77. doi:10.1038/s41525-021-00241-5
- McInnes G\*, Sharo AG\*, Koleske ML\*, Brown JEH\*, et al. 2021. Opportunities and challenges for the computational interpretation of rare variation in clinically important genes. *American Journal of Human Genetics 108*:535-548. doi:10.1016/j.ajhg.2021.03.003 (\*co-first authors)

1. Yan J, **Sharo AG**, Stone HA, Wingreen NS, Bassler BL. 2016. *Vibrio cholerae* biofilm growth program and architecture revealed by single-cell live imaging. *Proc. Natl. Acad. Sci. U.S.A. 113*: E5337-E5343. doi:10.1073/pnas.1611494113

### Peer Reviewer

G3: Genes, Genomes, Genetics, 2023 HGG Advances, 2023 Scientific Reports, 2023 Bioinformatics, 2022 BMC Genomics, 2022

#### **Conference Presentations**

- **Sharo AG**, Johnson JA, Novak BJ, Sunyaev SR, Ioannidis NM, Shapiro BA. Identifying Functional Genomic Variants in the Extinct Heath Hen through a Machine Learning Framework. Invited Talk. Plant & Animal Genome Conference. Jan 18, 2023. San Diego, CA.
- **Sharo AG**, Johnson JA, Novak BJ, Sunyaev SR, Ioannidis NM, Shapiro BA. A machine learning method to identify functional variants in data-constrained species. Poster and Lightning Talk. Conservation Genomics at the Population Level. Dec 1, 2022. Hinxton, United Kingdom.
- **Sharo AG**, Zou Y, Adhikari AN, Brenner SE. ClinVar and HGMD over time: incidence of misclassified variants across populations highlights strengths of curation databases and importance of population-specific resources. Poster Talk. American Society of Human Genetics Annual Meeting. Oct 27, 2020. Virtual.
- **Sharo AG**, Brenner SE. StrVCTVRE: A supervised learning method to predict the pathogenicity of structural variants. Platform Presentation. American Society of Human Genetics Annual Meeting. Oct 19, 2019. Houston, TX.

# Invited Talks

Department of Genetics, University of Cambridge, November 29, 2022. In person. Statistical Bioinformatics Seminar, University of Sydney. May 24, 2021. Virtual.

#### **Teaching Experience**

- Summer 2021 Instructor, **Bioinformatics Bootcamp**, UC Berkeley Paid instructor position to teach part of a week-long bootcamp organized by the Center for Computational Biology. Attended by 120 participants from academia and industry. Developed interactive modules using Jupyter Notebooks.
- Spring 2021 Graduate Student Instructor, **MCB 102 Biochemistry**, UC Berkeley Taught two weekly discussion sections, with a total of 54 students. Developed weekly quizzes and graded student participation. Led discussion sections focused on active learning techniques including polls, practice problems, and peer instruction.

# Students Supervised

2023	Ezra Collins, CSU Monterey Bay undergraduate. Comparison of migration timing across both modern and historical California steelhead trout.
2023	Delight Lee, CSU Monterey Bay undergraduate. Comparison of age-at-maturity across both modern and historical California steelhead trout.
2022-present	Randy Cabrera, UC Santa Cruz undergraduate. Population genetics of California steelhead trout.
2017-2020	Paulameena Shultes, UC Berkeley undergraduate. Rapid and novel quality control methods for DNA sequencing data. Currently: MD-PhD student at Case Western Reserve University

# STEM Outreach

2023	Mentor, <b>NIH GREAT Program (R25)</b> , UC Santa Cruz-CSU Monterey Bay Mentored two CSU Monterey Bay undergraduates through an NIH R25 grant to prepare underrepresented and low-income students for careers in genomics.
2022-present	Co-director, <b>GradPath</b> , UC Santa Cruz Co-founded a quarter-long program pairing undergraduates with grad student mentors in the sciences. Running for 2 academic quarters, with 29 mentoring pairs.
2022-present	Officer, Women in Science and Engineering, UC Santa Cruz
2022	Participant, <b>Equity-minded Mentoring</b> , UC Santa Cruz Completed a six-part workshop series run by the Center of Innovations in Teaching and Learning focused on supporting mentees from underrepresented backgrounds.
2021	Mentor, <b>The Compass Project</b> , UC Berkeley One-on-one mentoring of undergraduate students in the physical sciences to increase retention of underrepresented students.
2021	Academic Judge, Bioengineering High School Competition, UC Berkeley
2021	Organizer, <b>One Health Covid-19 Seminars</b> Led weekly seminar on the science and politics of Covid-19. Communicated basic science behind the immune system, vaccination, and epidemics to a lay audience. Seminar recordings available at www.onehealth.world/documents/
2016-2020	Instructor, Steering Committee Member, <b>Bay Area Scientists in Schools</b> Led monthly science lessons for 5th grade students in Berkeley and Oakland, CA. Taught a lesson on DNA replication that includes isolating banana DNA.
2016-2020	Co-founder and COO, <b>Physics Unlimited 501(c)(3)</b> Coordinated global high school physics competition held annually. Attracted funders to support our work. Awarded six mini grants of \$500 to US high school science teachers to improve remote learning during COVID-19 pandemic.
2017	Mentor, <b>Be A Scientist Program</b> Met weekly with six 7 <sup>th</sup> grade students at MLK Jr Middle School in Berkeley, CA. Supported their efforts to design, realize, and analyze results from a science experiment.

2015 Co-Director, **Princeton University Physics Competition** Led annual physics competition with 100+ high school US participants and 800+ global participants. Secured funding from trading firms and Princeton departments.

#### **Outreach Publications**

Sharo, AG. Focal power to the people. Fall, 2016. Berkeley Science Review.

### <u>Skills</u>

- Computational analysis: Python, R, Bash, Java, C, HTML, MATLAB, Mathematica, and Labview programming; Various computational biology applications
- Laboratory: PCR, confocal microscopy, strain engineering, microfluidics, plasma etching, photolithography

Music: Ukulele and piano; excellent stress outlet when research goes awry.

Languages: Proficient in French

Calm in stressful situations: Organized and led 30-person street safety team for march of 300 protesters in Salt Lake City, Utah.