

Aaron Pfennig, Ph.D.

Postdoctoral Research Associate, Akey Lab
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EDUCATION

Georgia Institute of Technology - Atlanta, GA	Aug 2020 - Jul 2024
Ph.D. in Quantitative Biosciences	
Thesis: “Theoretical and empirical population genetics of admixture and introgression”	
Advisor: Joseph Lachance	
Georgia Institute of Technology - Atlanta, GA	Aug 2019 - Jul 2020
Master of Science in Bioinformatics	
Project: “MgCod: Gene Prediction in Phage Genomes with Multiple Genetic Codes”	
Advisor: Mark Borodovsky	
Reutlingen University - Reutlingen, Germany	Mar 2015 - Feb 2019
Bachelor of Science in Biomedical Sciences	
Thesis: “A Peak Detection Method for Breath Gas Analysis using Deep Learning”	
Advisors: Carl-Martin Bell and Jan Baumbach	

RESEARCH EXPERIENCE

Princeton University - Princeton, NJ	Sep 2024 - Present
Postdoctoral Research Associate in Integrative Genomics	
Advisor: Joshua M. Akey	
Regeneron Genetics Center - Tarrytown, NY	Jun 2023 - Aug 2023
Intern in Therapeutic Area Genetics (Oncology)	
Manager: Jing He, Mgr. Integrative Translational Genetics	
University of Minnesota - Saint Paul, MN	Apr 2019 - Jul 2019
Research Intern in Veterinary Population Medicine	
Mentor: Noelle Noyes	
University of Essen - Essen, Germany	Mar 2019 - Jul 2019
Research Intern in Genome Informatics	
Mentor: Sven Rahmann	
University of Southern Denmark - Odense, Denmark	Aug 2017 - Feb 2018 & Aug 2018 - Feb 2019
Research Intern in Computational Biology	
Advisor: Jan Baumbach	

PUBLICATIONS

* indicates joint first authorship

† indicates joint corresponding authorship

Under review:

1. **Aaron Pfennig**† and Joseph Lachance†, The evolutionary fate of Neanderthal DNA in 30,780 admixed genomes with recent African-like ancestry, 2024, *bioRxiv*, <https://doi.org/10.1101/2024.07.25.605203> (under review at *MBE*)

Published and accepted journal articles:

1. Rohini Janivara, Ujani Hazra, **Aaron Pfennig** (author 3 out of 22), ..., and Joseph Lachance, Uncovering the genetic architecture and evolutionary roots of androgenetic alopecia in African men, 2025, *Human Genetics and Genomics Advances*, Volume 6, Issue 3, 100428, <https://doi.org/10.1016/j.xhgg.2025.100428>
2. **Aaron Pfennig**, Alexandre Lomsadze, and Mark Borodovsky, MgCod: Gene Prediction in Phage Genomes with Multiple Genetic Codes, 2023, *Journal of Molecular Biology*, Volume 435, Issue 14, 168159, <https://doi.org/10.1016/j.jmb.2023.168159>
3. **Aaron Pfennig**, Lindsay N Petersen, Paidamoyo Kachambwa, Joseph Lachance, Evolutionary genetics and admixture in African populations, 2023, *Genome Biology and Evolution*, Volume 15, Issue 4, evad054, <https://doi.org/10.1093/gbe/evad054>
4. **Aaron Pfennig** and Joseph Lachance, Challenges of accurately estimating sex-biased admixture from X chromosomal and autosomal ancestry proportions, 2023, *The American Journal of Human Genetics*, Volume 110, Issue 2, 359-367, <https://doi.org/10.1016/J.AJHG.2022.12.012>
5. Carl J Dyson*, **Aaron Pfennig***, Daniel Ariano-Sánchez, Joseph Lachance, Joseph R Mendelson III, Michael A D Goodisman, Genome of the endangered Guatemalan Beaded Lizard, *Heloderma charlesbogerti*, reveals evolutionary relationships of squamates and declines in effective population sizes, 2022, *G3 Genes|Genomes|Genetics*, Volume 12, Issue 12, jkac276, <https://doi.org/10.1093/g3journal/jkac276>
6. **Aaron Pfennig** and Joseph Lachance, Hybrid fitness effects modify fixation probabilities of introgressed alleles, 2022, *G3 Genes|Genomes|Genetics*, Volume 12, Issue 7, jkac113, <https://doi.org/10.1093/g3journal/jkac113>
7. Burcu F. Darst, Raymond Hughley, **Aaron Pfennig** (author 3 out of 101), ..., and Christopher A. Haiman, A Rare Germline HOXB13 Variant Contributes to Risk of Prostate Cancer in Men of African Ancestry, 2022, *European Urology*, Volume 81, Issue 5, pp. 458-462, <https://doi.org/10.1016/j.eururo.2021.12.023>
8. Nirojah Subramaniam, ..., **Aaron Pfennig** (author 9 out of 20), ..., and Daniel Robert Engel, Proteomic and bioinformatic profiling of neutrophils in CLL reveals functional defects that predispose to bacterial infections, 2021, *Blood Advances*, Volume 5, Issue 5, pp. 1259-1272, <https://doi.org/10.1182/bloodadvances.2020002949>
9. Christopher J Dean, Ilya B Slizovskiy, Kathryn K Crone, **Aaron Pfennig**, Bradley J Heins, Luciano S Caixeta, and Noelle R Noyes, Investigating the Cow Skin and Teat Canal Microbiomes of the Bovine Udder Using Different Sampling and Sequencing Approaches, 2021, *Journal of Dairy Science*, Volume 104, Issue 1, pp. 644-661, <https://doi.org/10.3168/jds.2020-18277>

INVITED SEMINARS

1. The evolutionary fate of introgressed and complex variation in human genomes, University of Buffalo, Evolutionary Genetics Seminar Series, Host: Omer Gokcumen, February 2026
2. From ancient to telomere-to-telomere genomes: Reconstructing human history across timescales, Princeton University, Biosociology Research Group, Hosts: Sam Trejo and Dalton Conley, October 2025
3. Revealing the hidden parts of the genome, Max-Planck Institute of Evolutionary Anthropology, Leipzig, Germany, Host: Janet Kelso, July 2025

CONFERENCE PRESENTATIONS

Oral presentations:

1. The evolutionary fate of Neanderthal DNA in 30,780 admixed genomes with recent African-like ancestry, *SMBE 2024*, Puerto Vallarta, Mexico, 2024
2. Hybrid fitness effects modify fixation probabilities of introgressed alleles, *Population Genetics Group Meeting 56*, London, UK, 2023
3. Hybrid fitness effects modify fixation probabilities of introgressed alleles, *Population, Evolutionary, and Quantitative Genetics Conference*, Pacific Grove, CA, 2022

Poster presentations:

1. Harnessing Methylation Information in Long-Read Sequencing Data Improves Variant Phasing, *ASHG 2025*, Boston, MA, 2025
2. The evolutionary fate of Neanderthal introgression in recently admixed African American genomes, *ASHG 2023*, Washington, D.C., 2023
3. Challenges of accurately estimating sex-biased admixture from X chromosomal and autosomal ancestry proportions, *SMBE 2023*, Ferrara, Italy, 2023

AWARDS & HONORS

- Larry S. O'Hara Fellowship, Outstanding Graduate Student, Georgia Institute of Technology, 2023
- Quantitative Biosciences Student Award for the best paper in Ecology, Evolution, and Population Biology, Georgia Institute of Technology, 2023
- Quantitative Biosciences Service Award for my work in the Quantitative Biosciences Student Government Association, Georgia Institute of Technology, 2022
- J. Leland Jackson Fellowship, Outstanding Master's Students, Georgia Institute of Technology, 2020
- Computational Biology Faculty Research Award, Georgia Institute of Technology, 2020
- Fulbright scholarship, Prestigious scholarship for graduate-level studies in the US, 2019
- Otto-Johannsen-Award, Most outstanding bachelor's thesis at Reutlingen University, 2018

TEACHING EXPERIENCE

Georgia Institute of Technology - Atlanta, GA Aug 2023 - Dec 2023

Graduate Teaching Assistant

BIOL 3600/6600, Evolutionary Biology

Virtual Quantitative Biosciences Hands-on Modeling Workshop May 2021

Instructor for hands-on modeling sessions on epidemic modeling (deterministic & stochastic models)

Georgia Institute of Technology, Atlanta, GA Aug 2020 - Dec 2020

Graduate Teaching Assistant

BIOL 1107L, Introduction to Biological Principles Laboratory

MENTORING EXPERIENCE

Mentoring in the Akey Lab, Princeton University - Princeton, NJ 2025

- Mentored a B.S. Computer Science undergraduate student developing computational methods for inferring population history in space. Specifically, I supervised the student implementing spatially explicit demographic models in SLiM and training machine learning

models on the simulated data before using them to infer aspects of population histories from real data

Mentoring in the Lachance Lab, Georgia Institute of Technology - Atlanta, GA

2022

- Mentored a B.S. Computer Science undergraduate student working to benchmark state-of-the-art methods (e.g., IBDmix, Sstar, hmmix, etc.) for detecting introgressed segments under various demographic scenarios

PROFESSIONAL & PERSONAL DEVELOPMENT

- Compass Postdoc Track, Washington University in St. Louis, Remote Professional development program focused on leadership, mentoring, and communication for postdoctoral researchers, 2025
- Future Values Fellowship, Princeton University, Selected participant in a program engaging STEM post-doctoral scholars and faculty in critical inquiry into the social, political and ethical dimensions of science and technology, 2024/25
- Interdisciplinary Health & Environment Development Program (IHE-LeaD) Fellowship, Georgia Institute of Technology, Selected participant in an interdisciplinary leadership fellowship bringing together trainees, community leaders, and policymakers to foster health solutions at the interface of science, policy, and sustainability, 2022/23

LEADERSHIP & COMMUNITY SERVICE

- Organizing Committee of the [Urban Air Quality in The Age of Climate Change Symposium 2023](#)
- Grand Challenges Facilitator, Georgia Institute of Technology, 2022/23
- VP and Treasurer of the Quantitative Biosciences Student Government Association, Georgia Institute of Technology, 2021 - 2023
- Student Chair of the [Quantitative Biosciences Hands-on Workshop 2021 on epidemic modeling](#)
- Treasurer of the Fulbright Board, Georgia Institute of Technology, 2020 - 2022

REFEREE ACTIVITIES

- *BMC Genomics, Current Biology, Evolution, G3 Genes|Genomes|Genetics, Molecular Biology and Evolution, PCI*

SOCIETY MEMBERSHIPS

- American Society of Human Genetics (ASHG), Society for Molecular Biology and Evolution (SMBE)

REFERENCES

- Joshua Akey, Princeton University: jakey@princeton.edu
- Joseph Lachance, Georgia Institute of Technology: joseph.lachance@biology.gatech.edu
- Charles Lee, The Jackson Laboratory for Genomic Medicine: charles.lee@jax.org