

Rebekah Hall

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Education

M.Sc. in Applied Mathematics / 2022 – present (*expected 2024*)

Simon Fraser University

Thesis topic: Local Adaptation of Life-History Traits in Seasonal Environments

Supervisor: Dr. Ailene MacPherson

GPA: 4.19

B.Sc. Honors in Applied Mathematics / 2017 – 2022

University of Alberta

GPA: 3.9

Research Experience

Graduate Student / Sept 2022 – present

Department of Mathematics, Simon Fraser University

Supervisor: Dr. Ailene MacPherson

- Mathematical models and stochastic simulations of local adaptation of life-history traits under density-dependent natural selection in seasonal environments

Research Assistant / Nov 2019 – Apr 2022

Department of Physics, University of Alberta

Supervisor: Dr. Daniel Charlebois

- Stochastic simulations of yeast colony growth and morphology when exposed to magnetic fields
- Stochastic simulations of the effects of crowding and non-genetic drug resistance on the evolution of drug resistant cells in spatially-heterogenous environments

Mathematics Research Project / Jan 2021 – Apr 2021

MATH 499, Department of Mathematical and Statistical Sciences, University of Alberta

Supervisor: Dr. Jay Newby

- Numerical methods for reaction-diffusion models of cell polarisation

Publications

Rebekah Hall*, Akila Bandara*, and Daniel A. Charlebois. Fitness effects of a demography-dispersal trade-off in *Saccharomyces cerevisiae* colonies. (2024) *Physical Biology*, 21(2):026001.
(* equal contribution)

Rebekah Hall, Daniel A. Charlebois. Lattice-based Monte Carlo simulation of the effects of nutrient concentration and magnetic field exposure on yeast colony growth and morphology. (2022) *In Silico Biology*, 14:53-69.

Other Publications

Rebekah Hall, Daniel A. Charlebois. Book review on “A World Beyond Physics: The Emergence and Evolution of Life” by Stuart A. Kauffman. (2020) *The Quarterly Review of Biology*, 95:133.

Presentations

Local Adaptation of Life History Traits in Seasonal Environments.

Presented at: 4th Biennial Meeting of SIAM Pacific Northwest Section; October 2023; Western Washington University, Bellingham, WA.

Simulating the effects of nutrients and magnetic fields on yeast colony growth and shape.

Presented at: Festival of Undergraduate Research and Creative Activities; March 2022; University of Alberta, Edmonton, AB.

Posters

Rebekah Hall, Ailene MacPherson. Local Adaptation of Density-Dependent Life History Traits. *Poster presented at:* EcoEvo Symposium; October 2022; Brackendale, BC.

Awards and Scholarships

Travel and Research Award (\$1 600) / **2024**

SIAM PNW 2023 Travel Support (\$500) / **2023**

Peter Borwein Memorial Graduate Scholarship in Mathematics (\$3 300) / **2023**

SFU Special Graduate Entrance Scholarship (\$10 000) / **2022**

Dean’s Silver Medal in Science / **2022**

Murray Thomas Gibson Memorial Scholarship in Mathematics (\$1 000) / **2021**

NSERC Undergraduate Summer Research Award (\$6 000) / **2021**

Alberta Innovates Summer Research Studentship (\$6 000) / **2020**

NSERC Undergraduate Summer Research Award (*declined to accept AI Studentship*) / **2020**

Teaching Experience

Graduate Teaching Assistant / Sept 2022 – present

Department of Mathematics, Simon Fraser University

- Support and grading in Q Workshop, supporting MATH 190 (*Principles of Mathematics for Teachers*) and FANX99 (*Foundations of Analytical and Quantitative Reasoning*).
- Leading MATH 150 (*Calculus I with Review*) seminars.

- Support and grading in Calculus Workshop, supporting MATH 150, MATH 151 (*Calculus I*), MATH 152 (*Calculus II*), and MATH 251 (*Calculus III*).
- Substitute lecturer for MATH 150/151 (*Calculus I*).
- Grading for MATH 468 (*Topics in Biomathematics: Stochastic Processes in Biology*).

Undergraduate Grader / Jan 2020 – Apr 2020

Department of Mathematical and Statistical Sciences, University of Alberta
MATH 146 (*Calculus for the Physical Sciences II*).

Service and Community Involvement

President / Sept 2023 – present

Math Graduate Caucus, Simon Fraser University

Graduate Student Representative / Sept 2023 – present

Graduate Studies Committee, Simon Fraser University

Group Co-coordinator / Sept 2023 – present

Math Graduate Student Support Group, Simon Fraser University

Graduate Student Representative / Feb 2023 – present

Math Equity, Diversity, and Inclusion Advisory Group, Simon Fraser University

Treasurer / Sept 2022 – Aug 2023

Math Graduate Caucus, Simon Fraser University

Languages: Native English; Proficient French