

EMMA KROELL

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EDUCATION

University of Toronto *September 2020 - Present*

PhD Candidate, Department of Statistical Sciences

Supervisors: Dr. Sebastian Jaimungal and Dr. Silvana Pesenti

McMaster University *September 2019 - August 2020*

Master of Science, Department of Mathematics and Statistics

GPA: 11.8 on a 12-point scale

Project: Sensitivity analysis of a Keen-based economic model with climate

Supervisors: Dr. Matheus Grasselli and Dr. Benjamin Bolker

McMaster University *September 2014 - April 2019*

Bachelor of Arts, Honours Mathematics and Economics

GPA: 12.0 on a 12-point scale

Undergraduate thesis: Modelling the economy and climate together: a two-region model

Supervisors: Dr. Matheus Grasselli and Dr. Benjamin Bolker

FELLOWSHIPS AND GRANTS

Canada Graduate Scholarship – Doctoral, \$105,000 *2022-25*

F.A.S.T. Doctoral Fellowship (University of Toronto), \$20,000 *2020-24*

Ontario Graduate Scholarship, \$15,000 *2021-22*

Ontario Graduate Scholarship, \$15,000 *2020-21*

NSERC Canada Graduate Scholarship - Master's, \$17,500 (declined) *2020-21*

The Milos Novontry Fellowship (McMaster University), \$4000 *2019-20*

NSERC Undergraduate Summer Research Award, \$9000 *2019*

McMaster Social Science Undergraduate Summer Research Award, \$7500 *2017*

AWARDS

Actuarial Science Student Research Presentation Award, Statistical Society of Canada *2022*

Department of Statistical Sciences Leadership Award, University of Toronto *2022*

The R. C. McIvor Medal, McMaster University *2019*

The Hurd Medal, McMaster University *2019*

The Provost's Honour Roll Medal, McMaster University *2017, 2018, 2019*

The Hugh Clarke Scholarship, McMaster University *2018*

The George P. and Leatha M. Keys Scholarships, McMaster University *2018*

The Dr. Harry Lyman Hooker Scholarship, McMaster University *2017*

Dean's Honour List Scholarship, University of Ottawa *2015*

PUBLICATIONS

Bolker, B.M., Grasselli, M.R. and **Holmes, E.**, *Sensitivity analysis of an integrated climate-economic model*, SIAM J. Finan. Math., Vol.12(2), p.SC-44–SC-57, 2021.

Rein, H., Hernandez, D.M., Tamayo, D., Brown, G., Eckels, E., **Holmes, E.**, Lau, M., Leblanc, R., Silburt, A., *Hybrid symplectic integrators for planetary dynamics*, Monthly Notices of the Royal Astronomical Society, Vol. 485, No. 4, 5490-5497, 2019.

INVITED AND CONTRIBUTED TALKS

Reverse sensitivity testing with compound Poisson processes

- Poster session, 2022 Gene Golub SIAM Summer School on Financial Analytics, L'Aquila, Italy, August 1 - 12 2022 (contributed)
- The 25th International Congress on Insurance: Mathematics and Economics, virtual (contributed), July 12 - 15 2022
- 49th Annual Meeting of the Statistical Society of Canada, virtual (invited), May 30 - June 3 2022
- Workshop on Emerging Insights in Insurance Statistics, Banff International Research Station, Banff, Canada (invited), January 16 - 21 2022 (cancelled)
- Math Finance Retreat, University of Toronto (contributed), August 11 - 13 2021
- FUSRFP Research Series, Fields Institute, Toronto, virtual (invited), July 30 2021

Sensitivity analysis of an integrated climate-economic model

- Stellar Stats Workshop, University of Toronto, virtual (contributed), May 28 2021

TEACHING

Teaching

Operational Math, DoSS Summer Prep Bootcamp (SPB), University of Toronto, July 2022 (20 hour course for incoming graduate students in Statistical Sciences)

Teaching Assistantships

University of Toronto

September 2020 - present

JSC270, *Data Science I*, Winter 2022.

Responsibilities: tutorial instruction, grading, discussion board moderation

STA490, *Statistical Consultation & Communication*, Fall 2021-Winter 2022.

Responsibilities: supervising and mentoring undergraduate capstone projects

ACT370, *Financial Principles for Actuarial Science II*, grading, Summer 2021.

STA237, *Probability, Statistics, and Data Analysis I*, creating assignments and grading, Spring 2021.

STA2540, *Insurance Risk Management*, grading and discussion board moderation, Winter 2021.

STA248, *Statistics for Computer Scientists*, help sessions and grading, Winter 2021.

ACT199, *Deciphering Financial Puzzles*, grading, Winter 2021.

STA457, *Time Series Analysis*, help sessions and grading, Fall 2020.

McMaster University

September 2018 - April 2020

MATH 1C03, *Introduction to Mathematical Reasoning*, leading tutorials and grading, Winter 2020.

MATH 1X03, *Calculus I for Math and Stats students*, leading tutorials, Fall 2019.

MATH 4MB3, *Mathematical Biology*, grading, Fall 2019.

MATH 1C03, *Introduction to Mathematical Reasoning*, grading, Winter 2019.

MATH 2UU3, *Numbers for Life*, grading, Fall 2018.

Curriculum Development

DoSS Mathematics Bootcamp, University of Toronto

April 2022 - present

Developed content for 20-hour math preparatory course for incoming graduate students in statistics with a focus on proofs and real analysis.

Academic Advisor, Fields Institute (Toronto)

September 2021 - present

Responsible for assisting with course material development for teacher candidate courses in mathematics and statistics, with a focus on mathematics fundamentals.

SERVICE

Treasurer, Statistics Graduate Student Union	<i>July 2022 - present</i>
President, Statistics Graduate Student Union	<i>July 2021 - June 2022</i>
Lead Organizer, Statistics Student Research Day conference	<i>May 2022</i>
First Year Representative, Statistics Graduate Student Union	<i>October 2020 - June 2021</i>
President, McMaster Math and Stats Society	<i>May 2018 - April 2019</i>
Social Activities Coordinator, McMaster Math and Stats Society	<i>May 2017 - April 2018</i>

OUTREACH

- Talk on Quantitative Risk Management, Undergraduate Research Opportunity Program Seminar, University of Toronto (Invited), July 19 2022
- Workshop Presenter, Girls in STEM Conference, University of Toronto, May 7 2022