

# Christopher Heggerud

University of Alberta - Department of Mathematical and Statistical Sciences

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## Education

**University of Alberta [Edmonton, Alberta]**

**September 2015 - Present**

Ph.D candidate in Applied Mathematics, transferred directly from the Master of Science program in September 2016. Supervised by Dr. Mark Lewis & Dr. Hao Wang.

**Ryerson University [Toronto, Ontario]**

**September 2011 – April 2015**

Bachelor of Science with honors in Applied Mathematics with a minor in Medical Physics. Supervised by Dr. Kunquan Lan

**University of Alberta- Augustana Campus [Camrose, Alberta]**

**September 2010 – April 2011**

Studied one year of Math and Physics.

## Awards

**Society of Mathematical Biology - Travel Grant**

**2019**

Financial support to participate in the ICMA VII conference hosted by Arizona State University.

**Faculty of Graduate Studies and Research (U of A) - travel award**

**2019**

1500\$ awarded to support graduate students travel to disseminate and develop their research .

**Alberta Innovates - Graduate Student Scholarship**

**2017/2018**

Provincial competition for academic and research excellence. Valued at \$31500 and held at the University of Alberta.

**NSERC [Canadian Graduate Scholarship - Masters]**

**2015/2016**

National competition for academic and research excellence. Valued at \$17500 and held at the University of Alberta.

**Walter H. Johns Graduate Fellowship**

**2015**

**Dennis Mock Student Leadership Award**

**2015**

Recognizes Ryerson graduating students who have made outstanding voluntary extracurricular contributions.

**C.Roy Horney Award**

**2014**

Fourth year Ryerson mathematics student that demonstrated an outstanding contribution to athletic and students life whilst obtaining a high CGPA.

**Paul and Anna Maria Bonato Scholarship**

**2014**

For having the highest academic standing in mathematics in my third year of study at Ryerson University.

**NSERC [Undergraduate Student Research Award]**

**2013 & 2014**

National competition for academic and research excellence. Held at Ryerson University.

**Howard Kerr Memorial Scholarship**

**2013**

For having the highest academic standing in mathematics in my second year of study at Ryerson University.

**Math Faculty Scholarship**

**2012**

For having the highest academic standing in mathematics in my first year of study at Ryerson University.

## Research

University of Alberta [Research Assistant]

September 2015 – Present

**NSERC [Undergraduate Student Research Award]**

Summer 2014

Supervised by Dr. Kunquan Lan a Ryerson University Math Department researching new methods of analyzing predator-prey models and disease models. This project was extended to be part of my Undergraduate Thesis.

**NSERC [Undergraduate Student Research Award]**

Summer 2013

Supervised by Prof. Dejan Delic of the Ryerson University Math Department in research areas related to graph theory.

## Supervising

**Co-supervisor [BIOL 498]**

Winter 2019

Co-supervised Daniel Jin for their biology undergraduate research project (BIOL498) at the University of Alberta.

**Co-supervisor [MITACS internship]**

Fall 2019

Co-supervised Julian Pavón García from Eberhard Karls University of Tübingen who was visiting with a MITACS Globalink Research Internship.

## Publications

**C. M. Heggerud, H. Wang, M. A. Lewis, *Transient dynamics of a stoichiometric cyanobacteria model via multiple-scale analysis.***

(In second review stage at SIAM Journal on Applied Mathematics ) (2019)

**C. Heggerud and K.Q. Lan, *Local stability analysis of ratio-dependent predator-prey models with predator harvesting rates.***

Applied Mathematics and Computation 270: 349-357 (2015)

## Talks

**Modeling Cyanobacteria: Transient and social-ecological dynamics.**

January 2020

Invited seminar talk hosted by Dr. Rebecca Tyson at the University of British Columbia Okanagan.

**Transient dynamics of a stoichiometric cyanobacteria model**

October 2019

Contributed talk at the Seventh International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA VII) at Arizona State University

**Multiple-scale analysis of a stoichiometric cyanobacteria model with phosphorus impulses**

July 2019

Presentation in the mini symposium, "Resource explicit population models", during the 2019 annual Society of Mathematical Biology meeting at the Université de Montréal.

**Perturbation Theory**

July 2019

Invited lecture for the International Undergraduate Summer Enrichment Program (IUSEP).

**Multiple-scale analysis of a stoichiometric cyanobacteria model with phosphorus impulses**

June 2019

Contributed talk at Levin Fest (A symposium at the intersection of mathematics and biology to celebrate the conferral of UVic Honorary Doctor of Science to Dr. Simon Levin) at the University of Victoria.

**Stoichiometric Modeling and Multi-Scale Dynamics of Cyanobacteria**

July 2018

Conference presentation at the 6th Butler memorial conference on Differential Equations and Population Dynamics at the University of Alberta.

**Stoichiometric Modeling and Multi-Scale Dynamics of Cyanobacteria**

June 2018

Conference presentation at the 2018 annual CAIMS meeting hosted by Ryerson University.

**Ratio-Dependence in Predator Prey Dynamics**

February 2015

First talk of the Undergraduate Mathematics Seminar series at Ryerson University.

## Academic and Professional Activities

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**International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA 7) [Arizona State University]** **October 2019**  
Attendee and speaker.

**Society of Mathematical Biology Annual Meeting [Université de Montréal]** **July 2019**  
Co-organizer (with Angela Peace ) of the mini symposium "Resource Explicit Population Models", attendee and speaker.

**Levin Fest [University of Victoria]** **June 2019**  
Attendee and speaker.

**6th Butler Memorial Conference on Differential Equations and Population Dynamics [University of Alberta]** **July 2018**  
Attendee, volunteer and speaker.

**2018 Canadian Applied and Industrial Mathematics Society Annual Meeting [Ryerson University]** **June 2018**  
Attendee and speaker.

**Investigative Workshop on Stoichiometric Ecotoxicology [NIMBioS- Knoxville Tennessee]** **January 2018**  
Active Participant.

## Teaching

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**University of Alberta [Teacher's Assistant]** **September 2015 – Present**  
Instructing Labs:  
MATH 201 (Differential Equations) - Fall 2015/Winter 2016/Fall 2016/Winter 2017  
Math 100 (Calculus I) - Fall 2018  
MATH 102 (Applied Linear Algebra) - Winter 2019  
Grading:  
MATH 201 (Differential Equations) - Spring/Summer 2016  
MATH 334 (Introduction to Differential Equations) - Fall 2017  
Decimal Robinson Support Centre: Fall 2015 - Winter 2019

**Ryerson University [Teacher's Assistant]** **September 2014 – April 2015**  
Instructing Labs:  
MATH 131 (Modern Mathematics I) - Fall 2014/Winter 2015

**The Math Guru [Tutor]** **January 2014 – April 2015**  
Tutored students of all levels ranging from grade 8 math to first year university math and statistics.

## Other Relevant Activities

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**Department of Mathematical and Statistical Sciences Math Outreach** **Fall 2015 - Present**  
Volunteer in math outreach at various events, such as "Dark Matters" at the Telus World of Science in Edmonton, Alberta.

**Math Fair & Unfair** **Fall 2015 - Present**  
Assisted in the University of Alberta event for elementary and junior high aged students, encouraging interest in mathematics through games and other activities.

**Ryerson Undergraduate Mathematics Seminars** **2014/2015**  
Co-founder and organizer for the seminars aimed to give undergraduate students experience in seminar presentation skills, as well as give students the opportunity to engage in Mathematics research.

**Ryerson Mathematics Course Union [President]****2014/2015**

Elected by a group of my peers as president in May 2014. My role was to create a community for Undergraduate students in the Mathematics program at Ryerson. I ran several successful events that helped students with academic issues and created a positive social atmosphere within the program.

**Ryerson Science Society [Director]****2014/2015**

Sat on the board of directors as the Ryerson Mathematics representative where we managed, monitored and oversaw affairs within the Ryerson Science Society.

**Undergraduate Mathematics Curriculum Advising Committee [Student Representative]****2014**

Acted as a Student representative to make sure the students voices are heard at the meetings, and to provide input to the faculty members involved.