

# Yonatan Ashenafi

[yonatanashenafi0@gmail.com](mailto:yonatanashenafi0@gmail.com)

---

## Education

### **Rensselaer Polytechnic Institute (RPI)- Troy, NY**

- Doctoral degree in mathematics: May-2021  
*Thesis:* Stochastic Hydrodynamics of Colonial Microswimmers  
*Advisor:* Professor Peter R. Kramer

### **Rensselaer Polytechnic Institute- Troy, NY**

- Master's degree in applied mathematics: August 2016-December 2018

### **Dordt University- Sioux Center, IA**

- Bachelor of Arts in mathematics: August 2012-May 2016
- 

## Experience

### **Postdoctoral Fellow, Worcester Polytechnic Institute**

*Fall 2023 –Present*

*Worcester Polytechnic Institute, Worcester, Massachusetts*

- Conducting research on Myosin transport over Actin fields
- Teaching Multivariable Calculus, Calculus 1, Calculus 2, and Ordinary Differential Equations.

### **Postdoctoral Fellow, University of Alberta**

*Fall 2021 – Summer 2023*

*University of Alberta, Edmonton, Alberta*

- Conducting research on the mechanisms of motion and suspension dynamics of raphid diatoms.
- Organizing a mathematical biology seminar (Fall 2021- Spring 2022)
- Teaching Calculus 1 for life sciences and Calculus 2 for physical sciences.
- Mentoring a master's student on a computer vision project for cell identification in suspension (Summer 2022).

### **Technical Fellow Intern, General Electric (GE) Research**

*Fall 2020*

*GE Global Research Center, Niskayuna, New York*

- Collaborating with the probabilistic design team on multiple projects on experimental design and additive manufacturing.
- Using Python for programming for Reinforcement Learning tasks.

### **Research Assistant, Dordt College**

*Summer 2014*

*Undergraduate Research, Dordt College-Sioux Center, Iowa*

- Collaborated with faculty and students on intellectually challenging projects.
- Trained in the statistical software, R, and utilized it to analyze data on the genetic expression of bacteria in various mediums.

### **Teaching Assistant, Rensselaer Polytechnic Institute**

*August 2016- May 2020*

*Mathematical Sciences Department, Rensselaer Polytechnic Institute- Troy, New York*

- Run recitation sessions and graded quizzes and exams for students in undergraduate mathematics classes.

### **Tutor, Dordt College Library**

*September 2013– May 2016*

*Academic Skills Center, Dordt College-Sioux Center, Iowa*

- Tutored students who requested assistance in the following classes: College Algebra, Calculus 1, Calculus 2, Multivariable Calculus, Linear Algebra, and Discrete Structures.
  - Cooperated and communicated effectively with tutees, faculty, and staff.
  - Gained more experience on the contents of the classes.
- 

## Services and Activities

- Mathematical Modeler at Mathematical Problems in Industry (MPI) workshop, University of Vermont, 2024.
- Volunteer grader for 34<sup>th</sup> annual math meet at WPI.
- Treasurer of Black Graduate Students Association at RPI for 2020.
- Presented at Biological Fluid Mechanics mini symposium of SIAM Life Science 2021 conference.
- Presented at Mathematical Biosciences Institute (MBI) Mathematical and Computational Methods in Biology Workshop 2020.

- Presented thesis research at Conference on Multiscale modeling in Biology at University of Minnesota Summer 2019.
- Presented thesis at Mathematical Biology Seminar Series Fall 2021.
- Organized a mini symposium titled “The Role of Noise and Asymmetry in Microscopic Life” at Canadian Applied and Industrial Mathematical Society (CAIMS) 2022.
- Attended AI for classroom workshop WPI 2023. Attended SIMIODE Webinars on tools for teaching differential equations.
- Presented my research at Biology and Medicine Through Mathematics (BAMM) 2024.
- Mathematical Modeler at Graduate Student Mathematical Modeling Camp at RPI in 2017.

## Awards

- Awarded Di Prima summer research fellowship for graduate research in the summer of 2018.
- Awarded Bill and Nancy Siegmann Applied Mathematical Modeling Prize for my thesis in May 2021.
- Awarded 2022 ASME CIE Advanced Modeling and Simulation Best Paper Award.

## Professional Membership

- Society of Industrial and Applied Mathematics (SIAM).

---

## Publications

- Yonatan Ashenafi and Peter R. Kramer. “Statistical Mobility of Multicellular Colonies of Flagellated Swimming Cells”. *Bulletin of Mathematical Biology* (2024).
- Yonatan Ashenafi “Stability and Spatial Autocorrelations of Suspensions of Microswimmers with Heterogeneous Spin”. *Physics of Fluids* (2022).
- Yonatan Ashenafi, Piyush Pandita, and Sayan Ghosh. “Reinforcement learning based sequential batch-sampling for Bayesian optimal experimental design” *Journal of Mechanical Design* (2021).
- Zheng, Peng et al. “Cooperative motility, force generation and mechanosensing in a foraging non-photosynthetic diatom.” *Open biology* vol. 13,10 (2023): 230148. doi:10.1098/rsob.230148
- Disselkoen, Craig, et al. "A Bayesian framework for the classification of microbial gene activity states." *Frontiers in microbiology* 7 (2016): 1191.

## In Preparation

- Yonatan Ashenafi and Peter R. Kramer. “Asymptotic Analysis of Kinesis and Taxis for Colonial Protozoa”. Preprint.

---

## Programming Skills

Python, MATLAB, C++, JavaScript, R