

Motasem ElGamel

Pittsburgh, PA

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Education

University of Pittsburgh

Physics - Ph.D. (expected 2025)

Advisor: Andrew Mugler.

2021 - Present

Pittsburgh, PA

University of Pittsburgh

Physics - M.Sc.

2019 - 2021

Pittsburgh, PA

University of Science and Technology at Zewail City

Physics - B.Sc. (Graduated Magna Cum Laude)

2015 - 2019

Giza, Egypt

Fellowships and Awards

Grad Expo 2024 Outstanding Presentation Award

Dietrich School of Arts and Sciences, University of Pittsburgh

- Awarded to the talk: “Clone size statistics of tumor-inhabiting bacteria”.

2024

Andrew W. Mellon Predoctoral Fellowship

University of Pittsburgh

- Awarded school-wide to doctoral students of exceptional promise and ability across the disciplines.

2023-2024

Best Poster Award at the Physics of Life 2023 Conference, Harrogate, UK

- Awarded to the poster presentation: “Effects of molecular noise on cell size control”.

2023

Pitt Graduate and Professional Student Government (GPSG) Travel Grant

University of Pittsburgh

2023

Thomas-Lain Fund Scholarship Essay Competition

Department of Physics and Astronomy, University of Pittsburgh

2023

Competitive Programs

Finalist in the DBIO Early Career Prize Session

APS March Meeting 2024

March 2024

Minneapolis, MN

Les Houches Theoretical Biophysics Summer School 2023

École de physique des Houches

July 2023

Les Houches, France

NSF Center for the Physics of Biological Function - Physics of Life Symposium

CUNY and Princeton University

November 2022

New York City, NY

Publications

Published

2. **M. ElGamel** and A. Mugler. Effects of molecular noise on cell size control. *Phys. Rev. Lett.*, 132:098403, 2024
1. **M. ElGamel**, H. Vashistha, H. Salman, and A. Mugler. Multigenerational memory in bacterial size control. *Physical Review E*, 108(3):L032401, 2023

Research Experience

Graduate Research Assistant (Advisor: Andrew Mugler, Ph.D.) **Fall 2020 - Present**
University of Pittsburgh

- Studying the effects of noise on bacterial growth on the single-cell level and population level.

Undergraduate Thesis (Advisor: Ali Nassar, Ph.D.) **2018 - 2019**

University of Science and Technology at Zewail City

- Explored the dynamics of the Ising model in 1 and 2 dimensions at criticality using analytical methods and simulations.

Research Work in High Energy Astrophysics (Advisor: Alaa Ibrahim, Ph.D.) **2017 - 2018**

University of Science and Technology at Zewail City

- Analysed and interpreted the data of x-ray bursts emission activity in strong magnetic fields neutron stars using HEASoft and IDL software and the data of NASA's RXTE mission.

Workshops and Summer Schools

Les Houches Theoretical Biophysics Summer School 2023 **July 2023**

École de physique des Houches

Les Houches, France

- A month-long school aimed at elucidating the function and principles of biological systems, from cells to ecosystems, in light of the laws of physics.
- Worked on assessing selection and coevolution in protein sequences as part of a group project.

Talks and Presentations

University of Pittsburgh Grad Expo 2024 **March 2024**

Contributed talk: "Clone size statistics of tumor-inhabiting bacteria"

Pittsburgh, PA

Applied Math Seminar, Department of Mathematics, University of Pittsburgh **March 2024**

Talk: "Growth Dynamics of Tumor-Inhabiting Bacteria"

Pittsburgh, PA

APS March Meeting 2024 **March 2024**

Selected talk for DBIO Early Career Prize Session: "Clone size statistics of tumor-inhabiting bacteria". Minneapolis, MN

Les Houches Theoretical Biophysics Summer School 2023 **July 2023**

Poster presentation: "Theory of noisy population growth in bacteria".

Les Houches, France

Physics of Life 2023 Conference **March 2023**

Poster presentation: "Effects of molecular noise on cell size control".

Harrogate, UK

APS March Meeting 2023 **March 2023**

Contributed talk: "Adder minimizes cell size noise in bacteria".

Las Vegas, NV

Gordon Research Conference and Seminar **January 2023**

Selected talk and poster: "Effects of molecular noise on cell size control".

Ventura, CA

NSF Center for the Physics of Biological Function - Physics of Life Symposium **November 2022**

Selected talk: "Theory of cell size homeostasis".

New York City, NY

The 2nd Biology for Physics Conference **July 2022**

Selected talk: "Multigenerational memory in bacterial size control".

Barcelona, Spain

APS March Meeting 2022 **March 2022**

Contributed talk: "Multigenerational memory in cell size homeostasis".

Chicago, IL

Skills

Programming Languages: Python, C++, Matlab, Mathematica, LabVIEW.

Techniques: Monte Carlo, Stochastic Simulation Algorithm.

Teaching Experience

Graduate Teaching Assistant

University of Pittsburgh

- PHYS 0110: Introduction to Physics 1.
- PHYS 0111: Introduction to Physics 2.
- PHYS 0174: Basic Physics for Science and Engineering 1.
- Lead recitations, held office hours, prepared quizzes, graded exams and wrote up homework solutions.

Undergraduate Junior Teaching Assistant

University of Science and Technology at Zewail City

- PHYS 101: Introduction to Physics 1.
- PEU 438: Compact Objects.

Mentoring and Service

Journal Reviewer

- Reviewed articles for *Physical Review Letters*, *Physical Review E*, and *Springer's Bulletin of Mathematical Biology*.
- Co-reviewed articles (with advisor) for *Physical Review X Life* and *Physical Review X*.

Undergraduate Research Mentor

Department of Physics and Astronomy, University of Pittsburgh

- Mentored undergraduate students Jianan Zhao and Lucas Ribaldo* in research.
- * Awarded the Emil Sanielevici Undergraduate Research Scholarship for his research on concentration-based cell size control in yeast.

Peer-Mentor in the Alumni Mentorship Program

Zewail City Alumni Association

- Mentored undergraduate student Mira Mohammed.

Graduate Student Mentor

Department of Physics and Astronomy, University of Pittsburgh

- Mentored two incoming graduate students.

Zewail City Science Festival

University of Science and Technology at Zewail City

- A public event that aims to deliver scientific concepts in a simplified manner to the public and spread the culture of science.
- Participated as an organizer, wrote a scientific talk for the public audience, and gave a mathematics talk.