

# Motasem ElGamel

Pittsburgh, PA

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**Research Interests:** Theoretical Biophysics, Complex Systems, Emergent Phenomena, Stochastic Physics, Statistical Mechanics, Cell Size Control, and Microbial Ecology.

## Education

<b>University of Pittsburgh</b> <i>Physics - Ph.D. (expected 2025)</i> Advisor: Prof. Andrew Mugler.	<b>2021 - Present</b> <i>Pittsburgh, PA</i>
<b>University of Pittsburgh</b> <i>Physics - M.Sc.</i>	<b>2019 - 2021</b> <i>Pittsburgh, PA</i>
<b>University of Science and Technology at Zewail City</b> <i>Physics - B.Sc. (Graduated Magna Cum Laude)</i>	<b>2015 - 2019</b> <i>Giza, Egypt</i>

## Fellowships and Awards

<b>Outstanding Presentation Award Pitt Grad Expo 2024</b> <i>Dietrich School of Arts and Sciences, University of Pittsburgh</i> <ul style="list-style-type: none"><li>Awarded to the talk: "Clone size statistics of tumor-inhabiting bacteria".</li></ul>	<b>2024</b>
<b>Andrew W. Mellon Predoctoral Fellowship</b> <i>University of Pittsburgh</i> <ul style="list-style-type: none"><li>Awarded school-wide to doctoral students of exceptional promise and ability across the disciplines.</li></ul>	<b>2023-2024</b>
<b>Best Poster Award at the Physics of Life 2023 Conference, Harrogate, UK</b> <ul style="list-style-type: none"><li>Awarded to the poster presentation: "Effects of molecular noise on cell size control".</li></ul>	<b>2023</b>
<b>Pitt Graduate and Professional Student Government (GPSG) Travel Grant</b> <i>University of Pittsburgh</i>	<b>2023</b>
<b>Thomas-Lain Fund Scholarship Essay Competition</b> <i>Department of Physics and Astronomy, University of Pittsburgh</i>	<b>2023</b>

## Competitive Programs

<b>Finalist in the DBIO Early Career Prize Session</b> <i>APS March Meeting 2024</i>	<b>March 2024</b> <i>Minneapolis, MN</i>
<b>Les Houches Theoretical Biophysics Summer School 2023</b> <i>École de physique des Houches</i>	<b>July 2023</b> <i>Les Houches, France</i>
<b>NSF Center for the Physics of Biological Function - Physics of Life Symposium</b> <i>CUNY and Princeton University</i>	<b>November 2022</b> <i>New York City, NY</i>

## Publications

### Published

2. **M. ElGamel** and A. Mugler. Effects of molecular noise on cell size control. *Phys. Rev. Lett.*, 132:098403, 2024
  - Press release: "**Pitt researchers are solving a mini mystery of cell division**", EurekAlert! (link)
1. **M. ElGamel**, H. Vashistha, H. Salman, and A. Mugler. Multigenerational memory in bacterial size control. *Physical Review E*, 108(3):L032401, 2023

## Workshops and Summer Schools

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### Les Houches Theoretical Biophysics Summer School 2023

*École de physique des Houches*

**July 2023**

*Les Houches, France*

### NITMB Ecological Dynamics of Microbial Communities: New Approaches Workshop

*National Institute of Theory and Mathematics in Biology*

**May 2024**

*Chicago, IL*

## Talks and Presentations

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### Invited talks

#### SIAM Conference on the Life Sciences 2024

*Invited talk: "Clone size statistics of tumor-inhabiting bacteria"*

**June 2024**

*Portland, OR*

### Competitively selected talks

#### APS March Meeting 2024

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

**March 2024**

*Minneapolis, MN*

#### Gordon Research Conference and Seminar

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

**January 2023**

*Ventura, CA*

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

*Selected talk: "Theory of cell size homeostasis".*

**November 2022**

*New York City, NY*

#### The 2nd Biology for Physics Conference

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

**July 2022**

*Barcelona, Spain*

### Contributed, seminar, and poster presentations

#### NITMB Ecological Dynamics of Microbial Communities: New Approaches Workshop

*Lightning talk: "Clone size statistics of tumor-inhabiting bacteria"*

**May 2024**

*Chicago, IL*

#### University of Pittsburgh Grad Expo 2024

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

**March 2024**

*Pittsburgh, PA*

#### Applied Math Seminar, Department of Mathematics, University of Pittsburgh

*Seminar: "Growth Dynamics of Tumor-Inhabiting Bacteria"*

**March 2024**

*Pittsburgh, PA*

#### Les Houches Theoretical Biophysics Summer School 2023

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

**July 2023**

*Les Houches, France*

#### Physics of Life 2023 Conference

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

**March 2023**

*Harrogate, UK*

#### APS March Meeting 2023

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

**March 2023**

*Las Vegas, NV*

#### APS March Meeting 2022

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

**March 2022**

*Chicago, IL*

## Teaching Experience

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### 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, Outreach and Service

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## Journal Reviewer

- Reviewed articles for *Physical Review Letters*, *Physical Review E*, *Physical Review X Life*, *Physical Review X*, and *Springer's Bulletin of Mathematical Biology*.

## Research Mentor

*Department of Physics and Astronomy, University of Pittsburgh*

- Mentored undergraduate students Jianan Zhao and Lucas Ribaud\* 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 one undergraduate student.

## 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.

## Skills

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

**Techniques:** Monte Carlo, Stochastic Simulation Algorithm.