

Motasem ElGamel

Pittsburgh, PA

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Education

University of Pittsburgh

Physics - Ph.D. (expected 2024)

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

Publications

1. **M. ElGamel**, H. Vashistha, H. Salman, and A. Mugler. Multigenerational memory in bacterial size control. *arXiv preprint arXiv:2206.05340*, 2022 (in review)

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.
- Project 1: Explaining the multi-generational size memory observed in Escherichia Coli. (**publication 1**)
- Project 2: Studying the effects of molecular noise on cell size control.
- Project 3: Studying the population growth dynamics of tumor-inhibiting bacteria subject to harsh environmental conditions.

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.

Talks and Presentations

Physics of Life 2023 Conference

March 2023

Accepted abstract: "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

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.

Languages: English, Arabic.

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

Peer-Mentor in the Alumni Mentorship Program

2021 - Present

Zewail City Alumni Association

- Mentored one ZC undergraduate student.

Graduate Student Mentor

Fall 2022 - Spring 2023

Department of Physics and Astronomy, University of Pittsburgh

- Mentored two incoming graduate students.

Head of Content Development of Educational Science Videos

Summer 2018 - Spring 2019

Zewail City Open Courseware (OCW)

- Helped build and design the scientific content of educational videos intended for the public.

Zewail City Science Festival

Summer 2016, Summer 2017

University of Science and Technology at Zewail City

- ZC Science Festival is a “conference for the public”. It 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.