Motasem ElGamel

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Education

University of Pittsburgh **2021 - Present**
Physics - Ph.D. (expected 2024) *Pittsburgh, PA*

University of Pittsburgh **2019 - 2021**
Physics - M.Sc. *Pittsburgh, PA*

University of Science and Technology at Zewail City **2015 - 2019**
Physics - B.Sc. (Graduated Magna Cum Laude) *Giza, Egypt*

Fellowships and Awards

Andrew W. Mellon Predoctoral Fellowship **Fall 2023 - Spring 2024**
University of Pittsburgh

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

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. **(publication in preparation)**
- Project 3: Studying the population growth dynamics of tumor-inhabiting 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**
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*

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

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.