MICHELLE GUREVICH

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RESEARCH INTERESTS

I am interested in using gravitational waves to better understand black hole ringdown and to test exotic compact objects, such as boson stars.

EDUCATION

PhD in Theoretical Physics — *King's College London* *2022-2026*
Funded by the Royal Society studentship — Theoretical Particle Physics and Cosmology Group
Thesis: *'Novel representations of gravitational wave radiation from general astrophysical sources'*
Supervised by Dr. Lionel London and Prof. Eugene Lim

MSc in Physics with Extended Research — *Imperial College London* *2020-2022*
Grade achieved: Merit
Thesis: *'A phenomenological model for modified gravitational wave dispersion relations'*
Supervised by Prof. Carlo Contaldi
Self-study project: *'Machine learning for 21cm studies and cosmology'*
Supervised by Dr. Jonathan R. Pritchard

REU Program — *Cerro Tololo Inter-American Observatory* *Summer 2016*
Competitive research program at NSF-funded observatory
Research project: *'Search for RR Lyrae stars in DES ultrafaint systems'*
Telescope time: 3 days (14 - 17 July, 2016) at the Blanco 4-m telescope
Supervised by Dr. Kathy Vivas

BS in Mathematics — *University of Michigan* *2014-2018*
Grade achieved: Honors
Minor in the History of Art

INDUSTRY EXPERIENCE

AI/Active Learning Intern
Exscientia *Summer 2022*

- Characterized edge cases and optimized training sets for an active learning algorithm used to accelerate drug design development
- Collaborated closely with pharmacology and small molecules teams to better understand how to generate better-suited biological targets

Software Engineer
JPMorgan Chase & Co *2018-2020*

- Refined algorithm for reducing false positive flagging of SWIFT payment messages, set up and managed database of 30,000 processed messages, and used results to predict validity of critical message fields
- Developed APIs for validating SWIFT payment messages as well as parsing and validating IBANs, wrote scripts for generating and anonymizing sensitive data
- Set up cross-currency shocks for emerging markets and aggregated scenarios for instruments with exposure to multiple risk factors; configured batch process jobs for sensitivity stress calculations

AWARDS AND HONORS

- IoP Research Student Conference Fund (£300) *2024*
- 4Cs Science Communication Competition *2021*
  Selected to present research to a panel of expert judges in the Graduate School of Imperial College London. One of a group of only 13 postgraduates picked from applicant pool.

ORGANIZATIONAL RESPONSIBILITIES

- Co-organizer, *London Cosmology Discussion Meetings (LCDM)*
  Coordinated with colleagues at central London universities to hold meetings at the Royal Astronomical Society on topics in inferential and theoretical cosmology.
- Local Organizing Committee, *9th Physics and Astrophysics at the eXtreme workshop (PAX IX)*
- Referee for 2 articles in *Journal of Open Source Software (JOSS)*

- Tutorials led for physics department: Gravitational waves (MSc course), Introduction to astrophysics (2nd year), Mathematical methods for physicists (1st year)
- Tutorials led for mathematics department: Applied differential equations (2nd year), Linear algebra (1st year)

SELECTED PUBLICATIONS

MG and L. London. *A new special property of Schwarzschild quasinormal modes.* In prep. May 2024.

L. London and **MG**. *Natural polynomials for Kerr quasi-normal modes.* arxiv pre-print. December 2023.

C. E. Martínez-Vázquez, A. K. Vivas, **MG**, et al. *Search for RR Lyrae stars in DES ultra-faint systems: Grus I, Kim 2, Phoenix II, and Grus II.* Monthly Notices of the Royal Astronomical Society, Volume 490, Issue 2, December 2019.

SELECTED TALKS AND MEETINGS

- **Selected poster - 4th EuCAPT Annual Symposium** *May 2024*
  CERN, Geneva
- **Triangular Conference on Cosmological Frontiers in Fundamental Physics** *April 2024*
  The University of Edinburgh School of Mathematical Sciences, Queen Mary University of London
- **Invited Talk — Analysis Seminar** *Jan 2024*
  Department of Mathematics and Statistics, Reading University
- **Selected talk - UK QFT XII** *Nov 2023*
  Institute of Physics (IoP), London
- **KICC-Villum Summer School on Gravitational Waves** *September 2023*
  Mon Repos, Corfu
- **Fundamental Physics with LISA** *August 2023*
  Niels Bohr Institute, Copenhagen
- **PONT Meeting** *May 2023*
  Palais des papes, Avignon
- **Selected talk - GRChombo Meeting** *April 2023*
  King's College London
- **LIGO-VIRGO-KAGRA Collaboration Meeting** *March 2023*
  CIERA, Northwestern University
- **Selected talk - Nordic Winter School on Gravitational Astrophysics** *Jan 2023*
  Skeikampen, Norway
- **Selected talk - BritGrav 22** *April 2022*
  University of Glasgow (online)

AFFILIATIONS

Scientific collaborations

- LIGO Scientific Collaboration *2022-present*

Professional memberships

- Member, Institute of Physics (MInstP) *2023-present*
- Fellow, Royal Astronomical Society (FRAS) *2022-present*
- Graduate student member, American Astronomical Society *2023-present*

PUBLIC OUTREACH

- SIRIUS B
  Contributed material on gravitational waves and numerical relativity to physics workbooks sent to to Native American girls in middle and high school in advance of synchronous, remote programming.
- Detroit Observatory
  Completed training to use the 0.4-m telescope located in the observatory of Angell Hall at the University of Michigan, operated the telescope and helped run public open houses as part of the Student Astronomical Society.
- Math Club Volunteer
  Taught middle school students from surrounding schools the basics of mathematical proof writing and logic puzzles.