

524 West 122<sup>nd</sup> Street  
New York, NY 10027

## MICHAEL E. BERKOWITZ

(856) 261-1534  
[m.e.berkowitz@gmail.com](mailto:m.e.berkowitz@gmail.com)  
<https://www.meberkowitz.com>

### EDUCATION

---

**New York, NY** **Columbia University** **Sept 2012-Present**

- **M.A., M.Phil. in Physics**, Sept 2017-May 2020. GPA: 3.8
- **B.S. in Computer Engineering**, Sept 2015-May 2017. GPA: 3.5
- **B.A. in Computer Science/Mathematics**, Sept 2012-May 2015. GPA: 3.5
- Graduate Coursework: Quantum Field Theory, Electromagnetic Theory, General Relativity, Statistical Mechanics, Particle Physics, Condensed Matter Physics, Modern Algebra & Group Theory.
- Undergraduate Coursework: Operating Systems, Computer Architecture, Circuit Analysis, Signals & Systems, Artificial Intelligence, Number Theory.

### EXPERIENCE

---

**Graduate Researcher** **Basov Infrared Laboratory** **Sept 2018-Present**

- Probing the nanoscale presentation of coupled light-matter modes in 2D quantum materials, specifically those in graphene and unconventional superconductors, to uncover the nature of previously unknown phenomena.
- Assembling the optics, beamlines, hardware, and software required to operate 3 scanning probe microscopes.
- Decreasing the measurement time for a near-field microscopy scan by 60% by implementing a conditional variational auto-encoder in TensorFlow and incorporating the network seamlessly into the lab's workflow.

**Software Engineer, Intern** **MathWorks** **Jun 2016-Aug 2016**

- Created a real-time performance monitor to allow developers and customers to analyze model performance.
- Added a C++/Javascript component to a large production-level codebase using Visual Studio.
- Worked with the MATLAB/Simulink performance team to determine the optimal design for the project.

**Software Engineer, Intern** **Prizmiq** **Jan 2015-Aug 2015**

- Designed a production-level website using HTML/CSS/Javascript in coordination with the creative director.
- Implemented the 3D Web-GL based viewer into the website to provide a seamless product previous experience.
- Collaborated with a development team of 6 developers and a business strategy team on multiple projects.

### TECHNICAL EXPERIENCE

---

- **EigenProbe** (Oct 2019-Present) Implementation of a spectral method for the simulation of coupled light-matter modes in 2D quantum materials. Runs 53% faster than previously used FEM simulation methods.
- **ScheduleBot** (Jan 2019-Sept 2019) Programmatic Python scheduler built to facilitate the assignment of teaching and exam proctoring responsibilities to teaching assistants. Reduced the time spent scheduling by 92%.
- **Spectral Analysis** (Jun 2017-Mar 2018) Python codebase for the analysis of over 9000 X-ray point sources found in satellite data from Chandra X-ray Observatory. Accompanying work was published in Nature research journal.
- **Freezer Scheduler** (Apr 2016) Process scheduler compiled into the Linux kernel which implements a simple round-robin scheduling algorithm with a 100 ms time-slice for every task. Built to support symmetric multiprocessing.

### PUBLICATIONS

---

- **In situ measurement of cesium-137 contamination in fruits from the northern Marshall Islands.**  
PNAS 116 (31) 15414-15419 (2019)
- **A density cusp of quiescent X-ray binaries in the central parsec of the Galaxy.**  
Nature 556, 70-73 (2018)

### SKILLS

---

- **Languages:** (*Proficient*) Python, C, C++, LaTeX. (*Familiar*) MATLAB, Mathematica, HTML/CSS/Javascript, SQL.
- **Technologies:** Windows, OSX, Linux, Git, Unix CLI, Google Cloud Platform, Docker, Kubernetes, Socket Programming (TCP/IP), Machine Learning, FEM Simulations, Unit/Integration Testing, Optics & Beamline Construction.