

# MARYAM HIRADFAR

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## EDUCATION

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### Harvard College

AB in Physics and Chemistry  
GPA: (3.965/4.0)

2017- 2021

## RESEARCH EXPERIENCE

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### Yun Lab, Wellman Center for Photomedicine

*Full Time Research Assistant*

Jun 2021 - Present

Cambridge, MA

- Working on developing triplet laser particle barcodes.

### Doyle Lab, Harvard Dept. of Physics

*Summer and Term-Time Student*

January 2018 - June 2021

Cambridge, MA

- Designed and constructed a magneto-optical trap (MOT) of potassium atoms. Trapped about 100 million atoms, with a density of 100 billion atoms/cc in 10 ms, an unprecedented achievement.

### Kao Lab, Case Western Reserve University

*Student Intern*

June 2016 - April 2017

Cleveland, OH

- Breast cancer research on transnational control of PML and its effects on cancer cell apoptosis. I learned and implemented biotechnology techniques and assays including PCR, Western Blot, wound healing assays, cell culturing, and bacterial transformation.

### AlphaMicron Company

*Visiting Student*

May - June 2016

Kent, OH

- Conducted a pilot study for determining the best tint of golf sport eyeglasses to be used in future products.

## TECHNICAL SKILLS

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### Mechanical Design

Inventor CAD

### Programming

Python, and Mathematica

### Typesetting Document

LaTeX

### Visual Design

Adobe Photoshop

### Mechanical

Certified machine shop operator

## TEACHING AND ADVISING EXPERIENCE

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### Physics 143a: Quantum Mechanics I

*Teaching Assistant*

Present

Harvard College

- I am helping with preparing teaching material and problem sets for the iteration of the course in Fall 2021.

### Harvard Academic Resource Center

*Peer tutor*

Fall 2020

Harvard College

- I tutored students in linear algebra, real analysis, biochemistry, biology, anatomy, and electromagnetism.

### Freshman Seminar 23Y: All of Physics in 13 Days

*Teaching Assistant*

Fall 2020

Harvard College

- I helped reformat the course for the virtual semester, and helped with student projects.

### Harvard Summer Undergraduate Research Village

*Program Assistant and Proctor*

Summer 2020

Harvard College

- Organized programs on photography, poetry, and abstract writing for students in the program during the virtual semester.

- I was responsible for holding weekly review sessions and office hours, as well as grading problem sets and exams.

## ACADEMIC PRESENTATIONS

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- Hiradfar, M., Lasner, Z., Mitra, D., Prabhu, S., Cheuk, L., Augendrahn, B., Lee, E., Doyle, J. (2021, June) *High density and loading rate MOT of K atoms using a buffer-gas beam source*. Poster session at the 52nd Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics.
- Hiradfar, M., Lasner, Z., Mitra, D., Prabhu, S., Cheuk, L., Augendrahn, B., Lee, E., Doyle, J. (2021, June) *High density and loading rate MOT of K atoms using a buffer-gas beam source*. 10-minute presentation at the 52nd Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics.
- Hiradfar, M., Prabhu, S., Lee, E., Lasner, Z., Augendrahn, B., Cheuk, L., Doyle, M. (2020, June). *Towards a Magneto-Optical Trap of Potassium Atoms Loaded from a Cold Buffer Gas Beam*. Poster session presented at the 51st Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics.

## PUBLICATIONS AND WRITING EXPERIENCE

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- Manuscript Preprint: Fast and High-Yield Loading of a  $D_2$  MOT of Potassium from a Cryogenic Buffer Gas Beam.
- Senior Thesis: A Fast and Dense Buffer-Gas Loaded Magneto-Optical Trap of Potassium.
- Harvard Summer Undergraduate Research Village Abstract Book 2019. (Editor in Chief)
- *Roadside*: A poetry collection, 2020.

## LEADERSHIP

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### Harvard College Community Council

*Voting Member*

June 2021 - August 2021

*Harvard College*

- Ensuring safety of the college community regarding COVID-19 and responding to concerns about violations of the Residential Community Compact.

### Harvard College Womxn in Physics

*Board Member*

January 2020 - Present

*Harvard College*

- Promoting diversity and inclusion in the physics department. Holding events, academic talks, advising and mentoring sessions for the undergraduate student body.

### Harvard College Honor Council

*Voting Member*

August 2019 - Present

*Harvard College*

- Evaluating and responding to violations of academic integrity and the Harvard College Honor Code.

## SERVICE AND VOLUNTEERING

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### Harvard Response Peer Counseling

*Peer Counselor*

January 2020 - Present

*Harvard College*

- Providing support for students regarding topics ranging from relationship issues and dating concerns to trauma caused by sexual harassment and/or assault.

### University of Texas Medical Branch at Galveston

*Emergency Room Volunteer*

Dec 2019 - June 2019

*Galveston, TX*

- Helping patients with admission to the emergency room, transportation, and paperwork.

### University of Texas Medical Branch at Galveston

*Geriatrics Volunteer*

August 2018

*Galveston, TX*

- Accompanying hospitalized elderly throughout their stay at the hospital, and providing emotional support.

## AWARDS AND HONORS

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### **Hoopes Prize**

May 2021

- “grant[s] annual awards to undergraduates on the basis of outstanding scholarly work or research.”

### **David McCord Prize**

May 2021

- For “unusual creative talent in writing, drama, music, painting, drawing or sculpture.” received for contributions to the Lowell House Poemical Society.

### **John Harvard Scholar Award**

May 2020

- For academic achievement during 2019-2020 academic year

### **Lowell House Bossert Prize**

May 2020

- “This prize recognizes a student with an outstanding academic record and a broad interest in the sciences...”

### **Harvard College Scholar Award**

Oct 2018

- For academic achievement during 2017-2018 academic year

## LANGUAGES

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**English (fluent)**

**Persian (fluent)**