

Jinsoo Park CV

64 Bader Lane, Stirling Hall

Physics

Queens University

Kingston, ON, K7L 1Y4

(647) 244-0322

<https://jinsoopark.com>

github.com/parkji30

RESEARCH INTERESTS

Studying Star Formation with BLAST-TNG and the Athena simulations.

Instrumentation design for Telescopes in space environments.

Data analysis for radio interferometers, millimeter cameras, spectrometers and polarimeters.

Computational techniques in machine learning, data pipelines, and numerical methods.

EDUCATION

Master of Science - Physics

Queens University, Kingston, ON

2020 – 2022

Thesis - Study the Role of Magnetic Fields in Star Forming Regions with BlastTNG

Honours Bachelor of Science - Math & Physics

University of Toronto, Toronto, ON

2014 – 2020

Thesis - Compression Algorithms for Super Pressurized Balloon Borne Telescopes

RESEARCH EXPERIENCE

(Star Formation) Fissel Group

2020 – Present

Graduate Research Assistant, Kingston, ON

Queens University

- Under the supervision of **Dr. Laura Fissel**, worked on the **BlastTNG collaboration project**.
- Implementation of the Davis-Chandrasekhar Fermi method (Python) to calculate the magnetic field strength of galactic molecular clouds.
- Used numpy, scipy to analyze data from Vela-C and the Athena simulations.
- Developed an automated solution registration script for Nova Astrometry.
- Programmed an in-flight image filtering software for data analysis and instrument noise reduction.
- Contribution towards a 30 million dollar funding proposal to NASA for the reconstruction of BlastTNG.

(Observational Cosmology) Netterfield Group

2019 – 2020

Undergraduate Research Assistant, Toronto, ON

University of Toronto

- Under the supervision of **Dr. Barth Netterfield**, worked on the **SuperBIT collaboration project**.
- Implementation of a galaxy map simulator using Monte Carlo algorithms.
- Used numpy, scipy and aplpy to analyze galaxy maps for weak gravitational lensing effects.
- Programmed an optimization software to compare the efficiency of different compression algorithms.
- Obtained a compression factor of 5.15 for the densest image.

(Quantum Optics) Vutha Group

2017 – 2019

Undergraduate Research Assistant, Toronto, ON

University of Toronto

- Under the supervision of **Dr. Amar Vutha**, worked on the **PolyEDM collaboration project**.
- Developed a Python program that simulates magnetic fields in a high powered molecular beam slower.
- Programmed a theoretical model for the behavior YbOH molecules under the presence of turbulent magnetic fields.
- Created a numerical and analytical differential equation solver for the magnetic dipole moment of molecules.
- Used AutoCAD to design and construct a fully functional nitrogen shield vacuum chamber.
- Debugged and designed new instrumentation equipment such as: RF switch boxes, diode temperature cables, DAC devices, etc.

PUBLICATIONS & THESIS

- "Application of the Davis-Chandrasekhar Fermi Method on molecular cloud simulations (2021)" *In Progress*
- "Probing the role of magnetic fields in Star Formation with BLAST-TNG (2022)", *Queens University, Department of Physics, Msc. Thesis*
- "Compression Algorithms for Super Pressurized Balloon Borne Telescopes (2020)", *University of Toronto, Department of Physics, Senior Thesis*

TALKS & PRESENTATIONS

- "BlastTNG- To the Stars!" **podcast talk**, *Queens Observatory 2021*
- "The Role of Magnetic Fields in Star Forming GMCs", **poster presentation**, *CASCA 2021*
- "The Use of Compression Algorithms for Balloon Borne Telescopes", **poster presentation**, *The Scientific Ballooning Technologies Workshop 2021*
- "Detection of Dark Matter in Space via. Weak Gravitational Lensing", **talk**, *QUARG, 2021*
- "Gravity and Rotation drag the Magnetic Field in High-mass Star Formation", **talk**, *QUARG", 2020*

TEACHING EXPERIENCE

Teaching Assistant

2020 – Current

Queens University, Kingston, ON

- Delivered lecture content via Zoom.
- Marked assignments, quizzes, tests, examinations.
- Held office hours for further assistance.
- To date, I have taught:
 - PHYS372 (Thermodynamics and Statistical Mechanics), **Winter 2021**
 - PHYS118 (Introductory Physics II), **Winter 2021**
 - PHYS117 (Introductory Physics I), **Fall 2020**

High School Teacher

2018 – 2020

The Abelard School, Toronto, ON

- Developed an enriched and accelerated computer science curriculum for gifted high school students.
- Designed and lectures, assignments, and examinations according to the standards for the Ontario ministry of education.
- Delivered lecture content in-person and online.

Tutor

2017 – 2018

Prime Academy, Toronto, ON

- Engaged one on one with high school students as a private tutor.

- Taught sciences, math and programming.

WORKING EXPERIENCE

Software Developer

2020 (2 month internship)

WFHomie Inc., Toronto, ON

- Complete front end integration of website responsiveness and design using React.Js, Material UI.
- Development of user registration, authentication using Firebase, Express.js.
- Lead a team in product design and deployment for subscribed customers.
- Virtual presentation for demonstration of product to angel investors.

Manager

2016 – 2018

Toronto Gunners Soccer Club, North York, ON

- Handled administrative and financial tasks for all club activities and events.
- Led a marketing strategy team to engage with fundraising activities and recruit new club members.
- Increased revenue by 25000 dollars during tenure.

PROGRAMMING & DEVELOPED SOFTWARE

Over **seven years of programming experience in Python, C/C++**. Experience working with SQL/NoSQL, shell, bash, Java, HTML5, CSS, Javascript, Git, machine learning, algorithms, and data structure design.

A detailed description of all my work and publications can be found on my website- **www.jinsoopark.com**

I am the original author and designer of **<https://Balloonatics.com>**- A beautifully designed React website which has the location and description of multiple balloon borne astrophysics research from around the globe.

I am also proud to have made contributions to **astropy** by developing a Python implementation of the Davis Chandrasekhar Fermi method along with an automated solution script for **astrometry.net**.

PUBLIC OUTREACH & EXTRACURRICULARS

I am also a member of **Queens U. Observatory** where I served as a guide for the general public, providing telescope viewings along with presentations in modern astrophysics research. The Queen's Observatory offers daytime tours for schools, summer camps and educational institutions. We are able to accommodate any range of ages by introducing the wonders of the sky to school children and fueling their curiosity.

I am also a member of the **"Let's Talk Science!"** group at Queens University. Let's Talk Science supports the development of all youth into creative, critical thinkers and knowledgeable citizens who are prepared to participate and thrive in a complex global environment. I am particularly involved in doing outreach and raising awareness for underrepresented and minority groups in STEM.

HONORS & AWARDS

Research Assistant Stipend, Queens University
Queens Graduate Award, Queens University
Undergraduate Research Fund, University of Toronto