

Jinsoo Park CV

64 Bader Lane, Stirling Hall

Physics

Queens University

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<https://jinsoopark.com>

github.com/parkji30

RESEARCH INTERESTS

Studying the inefficiency in star formation and polarization from magnetic dust grains using high powered telescopes such as BlastTNG.

Investigating the distribution of dark matter in nearby galaxy structures using SuperBIT, a super pressurized high powered balloon borne telescope.

Computational techniques for application of machine learning and numerical simulations in astrophysics research.

EDUCATION

Master of Science - Physics/Astronomy

Queens University, Kingston, ON

2020 – 2022

Thesis - Observing Star Formation with High Powered Telescopes

Bachelor of Science - Math

University of Toronto, Toronto, ON

2014 – 2020

Thesis - Compression Algorithm for Super Pressurized Balloon Borne Telescopes

RESEARCH EXPERIENCE

(Star Formation & Relativity) Fissel Group

2020 – Present

Research Assistant, Kingston, ON

Queens University

- Under the supervision of Dr. Laura Fissel, worked on the **BlastTNG project**.
- Design and implementation of the pointing system.
- Developed an optimal compression algorithm with a factor of 5.
- Developed an optimal astrometry solve-field script using Python that automatically registers solutions.
- Developed a noise reduction program used to purify images obtained by BlastTNG.
- Application of the David-Chandrasekhar Fermi method on the Vela-C data and it's simulated counterparts.

(Observational Cosmology) Netterfield Group

2019 – 2020

Research Assistant, Toronto, ON

University of Toronto

- Under the supervision of Dr. Barth Netterfield, worked on the **SuperBIT** collaboration project.
- Developed an optimal compression algorithm with a compression factor of 5.15 for the densest SuperBIT image.
- Developed a pseudo astronomical image simulation program that generates images with similar parameters obtained by SuperBIT.
- Created an optimization software to compare the efficiency of different algorithms to compress over 10000 simulated stars.

(Quantum Optics) Vutha Group

2018 – 2019

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.
- Created a theoretical model for the behavior YbOH molecules under the presence of turbulent magnetic fields.
- Created a numerical and analytical differential equation solver.
- 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.

TEACHING EXPERIENCE**Teaching Assistant (PHYS118)**

2021

Queens University, Kingston, ON

- Designed and taught course material for first year physics students.
- Marked assignments, quizzes, tests, examinations.

Teaching Assistant (PHYS117)

2020

Queens University, Kingston, ON

- Designed and taught course material for first year physics students.
- Marked assignments, quizzes, tests, examinations.

Lecturer

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 both in-person and online.

WORKING EXPERIENCE**Manager**

2016 – 2018

Toronto Gunners Soccer Club, North York, ON

- Handled administrative and financial tasks, obtained permits and registered player information with the Ontario Soccer Association.
- Engaged with fundraising activities and designed fundraising proposals to raise capital for club expenditures.
- Increased revenue by approximately 25000 dollars during tenure.

PROGRAMMING ABILITIES & DEVELOPED SOFTWARE

Over seven years of programming experience in Python, C/C++. Experienced in SQL, shell, bash, Java, HTML5, CSS, Javascript, Git, Web Development.

Below are a few example of my most notable work for **research in Physics and Astronomy**. All of them and many others can be found on my GitHub.

Automated Astrometry Solution Script (Python)

- An automated python script that records any found image solutions using Astrometry.

Multiprocessing Magnetic Beam Simulation Program (Python)

- A simulation program used to model a magnetic beam slower for the PolyEDM project.

Simulating Compression Algorithms for Astronomical Images. (Python)

- A simulation program that finds the most optimal compression algorithm for a given image.

PUBLICATIONS

- "Compression Algorithms for Super Pressurized Balloon Borne Telescopes", *University of Toronto Department of Physics Senior Thesis*

TALKS / PRESENTATION

- "The Role of Dust and Molecules in the Atmospheres of Cool Stars", *Queens University, 2020*
- "Modern Interpretations of Star Forming Giant Molecular Clouds", *Queens University, 2020*

PUBLIC OUTREACH

I am regularly engaged in sharing and giving talks about my research and other related topics to the general public. I am a strong advocate of

- "Freewill, Determinism, and the role of Physics", *Queens Newman Centre, 2020*

MEMBERSHIPS

Queens Graduate Physics Student Association
Canadian Scientific and Christian Affiliation
Society of Catholic Scientists

HONORS & AWARDS

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