Jared Wogan

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"The best that most of us can hope to achieve in physics is
simply to misunderstand at a deeper level." - Wolfgang Pauli

I am a Master's student at the University of Western Ontario, studying physics with a scientific computing specialization. I have writen a Python package for general relativity, OGRePy, and a research project on wormhole time machines and multiple histories. I am passionate about cryptography and cyber security, data science, high performance computing, and software development. I am currently looking for a co-op position in 2023.

Education

Western University
M.Sc in Physics, Scientific Computing Specialization   *2022 – Present*

Compute Ontario
Compute Ontario Summer School   *June 2022 – September 2022*

- Data Visualization
- Machine Learning
- High Performance Python
- GPU Programming
- C/C++, MPI, and OpenMP

Brock University, University of Guelph
B.Sc in Physics (Honours), Minor in Mathematics   *2017 – 2022*

- Cumulative average of 82% (3.7 GPA on 4 point scale)
- Major average of 92% (4.0 GPA on 4 point scale)
- Upper level course average of 93% (4.0 GPA on 4 point scale)

Welland Centennial Secondary School
Ontario Secondary School Diploma   *2013 – 2017*

- Grade 12 average of 94.3%
- French immersion

Certifications

Coursera
Data Science Orientation *February 2023*
Badge

Coursera
Introduction to Cybersecurity Tools & Cyber Attacks *February 2023*
Badge

Microsoft
Microsoft Office Specialist: Word 2013 *March 2016*
Badge

Microsoft
Microsoft Office Specialist: Excel 2013 *March 2016*
Badge

Microsoft
Microsoft Office Specialist: PowerPoint 2013 *April 2016*
Badge

Research Experience

Undergraduate Thesis

PyOGRe **Brock University**
Advisor: Professor Barak Shoshany *September 2021 – April 2022*

- A Python Object-Oriented General Relativity package
  - Adaptation of the Mathematica package OGRe

Research Projects

Wormhole Time Machines and Multiple Histories **Brock University**
Advisor: Professor Barak Shoshany *April 2021 – September 2021*

- Studying Time Travel Paradoxes and Causality
  - Created a simulation of paradoxes within Mathematica
  - Updated existing paradox model to use temperature instead of colours for the particles
  - Replaced model TDP space with a wormhole metric using general relativity to calculate geodesics that produce paradoxes

Publications

Wormhole Time Machines and Multiple Histories
Jared Wogan, Barak Shoshany *October 2021*
arXiv:2110.02448

Scholarships, Awards & Honours

Returning Scholars Award
Brock University, $1,500   *2021*
- Returning student with an average of 94.9% the previous year

Match of Minds
Brock University, $5,000   *2021*
- Research Grant

Dean's Honour List
Brock University   *2021*
- Average of 80%+ for academic year of 2020 - 2021

Entrance Scholarship
University of Guelph, $7,000   *2017*
- Outstanding admissions average

Ontario Scholar
Welland Centennial Secondary School   *2017*
- Obtained an average of 80% or higher in any six Grade 12 courses

Euclid Test
University of Waterloo   *2017*
- School champion

Mathematics Scholarship
Welland Centennial Secondary School, $150   *2017*
- Presented to the student with the highest GPA in grade 12 Mathematics

Physics Scholarship
Welland Centennial Secondary School, $150   *2017*
- Presented to the student with the highest GPA in grade 12 Physics

Fermat Test
University of Waterloo   *2016*
- Certificate of Distinction for ranking top 25% of contestants

Conference Posters

The Quantum Information Structure of Spacetime
Western University, Ontario, Canada   *June 2022*

- PyOGRe: A Python Object-Oriented General Relativity package

Media Appearances

New Brock research explores time travel paradoxes
Brock University, Ontario, Canada   *December, 2021*

Teaching Experience

Private Tutor
Independent Private Tutor   *January 2020 – Present*

- Work one-on-one with individual students at the High school level
- Specialize in intermediate and senior level math, calculus, data management, and physics

Independent Peer Tutor
Brock University   *2020*

- Organized and taught a student study group for Electromagnetism
- Held review and one-on-one sessions with students in need of assistance

Mathematics PAL
Welland Centennial Secondary School   *2017*

- Teaching assistant and tutor for a grade 9 french mathematics course
- Worked one-on-one and motivated students
- Marked and wrote problems for tests

Relevant Coursework

- **Physics:** Classical Mechanics, Electromagnetism, Quantum Mechanics, Statistical Mechanics and Thermal Physics, Optics, General & Special Relativity
- **Mathematics:** Calculus, Differential Equations, Linear Algebra, Statistics, Complex & Real Analysis, Differential Geometry

Technical & Personal Skills

- **Programming Languages:** Python, C++, Physica, Javascript, Markdown, HTML, CSS
- **Software:** Git, Mathematica, Maple, LaTeX
- **Operating Systems:** Mac OS, Linux, Windows
- **Personal Skills:** Passionate, Hard Working, Collaborative, Time Management, Organization, Planning, Leadership, Curious

Extracurricular Activities

Brock University Physics Discord
Discord Maintainer   2021 – Present
- Created and maintain the (unofficial) University Physics Discord

University of Guelph
Physics Club   2017-2018
- Participated in weekly gatherings to discuss current developments Physics
- Meeting professors and other students
- Telescope observation night

University of Guelph
Jack.org   2017-2018
- Mental health awareness movement
- Volunteered and participated in regular events throughout school terms

Work Experience

McDonalds Canada   **Fonthill, ON**
Line Cook, Customer Service   *March 2019 – Present*
- Customer service
- Communication skills
- Working as a team towards common goals

Candian Niagara Power   **Fort Erie, ON**
IT Intern / Coop Student   *May 2018 – September 2018*
- Computer maintenance and deployment

Hard Rock Cafe   **Niagara Falls, ON**
Dishwasher, Line Cook   *June 2015 - September 2017*
- Working and collaborating with team members
- Communication skills
- Working in a stressful and time sensitive environment

Hobbies

Computers
- Regularly building and maintaining computers

Programming
- Passion Projects
- Developed a Discord bot for use in my personal Discord
- Creating fractals using Python

Music
- Occasional mixing done in FL Studio