

# 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 student in my final year at Brock University, finishing a Bachelors of Science with a major in Physics and a minor in Mathematics. I am passionate about theories of gravity and causality within general relativity and quantum mechanics. I would like to use the skills and knowledge from this degree to push myself to explore these topics further, with a focus on theories of quantum gravity.

## Education

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### **Brock University, University of Guelph**

*B.Sc in Physics (Honours), Minor in Mathematics*

2017 – 2022

- Cumulative average of 81.0% (3.7 GPA on 4 point scale)
- Major average of 89.0% (4.0 GPA on 4 point scale)
- Upper level course average of 91.4% (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

## Research Experience

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### **Undergraduate Thesis**.....

#### **PyOGRE**

*Advisor: Professor Barak Shoshany*

#### **Brock University**

*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**

*Advisor: Professor Barak Shoshany*

#### **Brock University**

*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

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### **Wormhole Time Machines and Multiple Histories**

Jared Wogan, Barak Shoshany

arXiv:2110.02448

October 2021

## Scholarships, Awards & Honours

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### **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

## Teaching Experience

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### 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

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- **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

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

## Extracurricular Activities

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### **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

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### **McDonalds Canada**

*Line Cook, Customer Service*

**Fonthill, ON**

March 2019 – Present

- Customer service
- Communication skills
- Working as a team towards common goals

### **Candian Niagara Power**

*IT Intern / Coop Student*

**Fort Erie, ON**

May 2018 – September 2018

- Computer maintenance and deployment
- Computing projects in Visual Basic

### **Hard Rock Cafe**

*Dishwasher, Line Cook*

**Niagara Falls, ON**

June 2015 - September 2017

- Working and collaborating with team members
- Communication skills
- Working in a stressful and time sensitive environment

## Hobbies

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### *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