

JACOB CARDINAL TREMBLAY

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EDUCATION

Universität Bonn

Master of Science in Astrophysics

Projected Graduation Date - July 2022

West Virginia University

Bachelor of Science in Physics, Cum Laude

August 2017 - May 2021

RESEARCH EXPERIENCE

Optimal Frequency Channelization for Pulsar Dispersion Measurements

January 2021 - Present

Advisors: Dr. Maura McLaughlin

West Virginia University

- Simulated pulsar data based on known NANOGrav pulsars using the *Pulsar Signal Simulator* Python package.
- Currently developing a model to minimize the uncertainty in dispersion measure depending on different pulsar parameters to aid in the detection of gravitational waves from pulsar timing arrays.

Analysis of Dispersion Measure Variations in NANOGrav Pulsars

May 2020 - August 2020

Advisors: Dr. Cherry Ng and Dr. James McKee

University of Toronto

- Used extremely high cadence observation data from CHIME to make high quality 2-D templates by creating and implementing BASH and Python pipelines, as well as manual RFI cleaning in order to measure TOAs through template matching.
- Evaluated DM variation statistics such as periodicity, Kolmogorov turbulence, solar wind signature and evidence of discrete plasma structures in order to increase NANOGrav sensitivity.

Pulsar Searching from Fermi Gamma-ray Sources

August 2019 - August 2021

Advisor: Dr. Maura McLaughlin

West Virginia University

- Visual plot evaluation in an effort to discover new millisecond pulsars to be used by NANOGrav in pulsar timing arrays.

Experimental Physics Research

February 2018 - August 2019

Advisor: Dr. Matthew Johnson

West Virginia University

- Developed a force sensor and computer program to analyse a gymnast's landing.
- Built circuits to control stepper-motors using LabView as an interface.
- Developed outreach demonstrations which explore many areas of physics.

SKILLS

Computer Languages:

Proficient in

Bash, Python, Java, LaTeX

Basic knowledge of

LabView, MatLab

Skills & Training

Trained on WVU's 14" Celestron telescope, various machining tools, soldering, basic computer engineering

Languages

Fluent in English and French

GRANTS AND AWARDS

SURP Fellowship

University of Toronto

Summer 2020

Fellowship for research with the Summer Undergraduate Research Program (SURP) at the David A. Dunlap Department of Astronomy and Astrophysics and the Dunlap Institute for Astronomy and Astrophysics at the University of Toronto.

Ratna and Vaman Naik Endowed Physics Scholarship

West Virginia University

2020 - 2021

Scholarship awarded to students who display excellence in academic merit.

National Space Grant Foundation Undergraduate Fellowship

West Virginia University

2019 - 2020, 2020-2021

Fellowship and scholarship to aid in research projects.

CSCAA Scholar All-American, First Team

West Virginia University

2019 - 2020

Athlete achieving a GPA of 3.5 or higher and invited to the NCAA Swimming and Diving Championships.

President's List

West Virginia University

Spring 2020

Students who receive a GPA of 4.0 for the given semester.

Athletic Scholarship

West Virginia University

2017 - present

Awarded athletic scholarship to compete on West Virginia University's NCAA division I diving team.

International Student Scholarship

West Virginia University

2017 - present

Scholarship awarded to international students with a GPA of 3.2 or higher.

OUTREACH AND MENTOR POSITIONS

West Virginia University Astronomy Club

2020-2021

President

West Virginia University

- Gave bi-weekly interactive astronomy related presentations, organized events, and helped guide younger students through their undergraduate careers.

Pulsar Search Collaboratory

Sept 2019 - Present

Mentor

West Virginia University

- Outreach to high school students which involves both introducing pulsar astronomy and helping them learn to search for pulsars through forum participation.

Greenbank Observatory Open House

September 8th, 2019

WVU Department of Physics and Astronomy Ambassador

West Virginia University

- Gave physics presentations to the general public and explained the concepts which makes them possible.