

# Jarryd Horn

## Curriculum Vitae

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### Education

- 2015-2019 **B.Sc. Northern Michigan University**, Marquette, MI 49855,  
Overall GPA: 3.81 | Major GPA: 3.88,  
Major: Physics; Minor: Mathematics  
Ronald E. McNair Scholar; Magna Cum Laude.
- 2019- **Ph.D. Physics at University of Maryland**, College Park, MD 20740.

### Research Experience/Internships

- Spring 2017 **Characterizing the Muonium Impurity in Anatase Titanium Dioxide**  
-Present Research Advisor: Rick Mengyan, Ph.D.
- Description In this study, muonium ( $\text{Mu}^0 = \mu^+ + e^-$ ) is used as an experimentally accessible hydrogen (H) analog to study the low temperature state and associated motional dynamics of isolated H impurities in Anatase Titanium Dioxide. This project is in contribution to a large scale ongoing investigation of hydrogen impurities in transparent conducting oxides. Muon Spectroscopic measurements for this project have been taken at STFC-ISIS pulsed muon source in Chilton, UK and TRIUMF continuous muon source in Vancouver, CA.
- Summer 2018 **Epitaxial Growth of Thin Films at The Ohio State University**  
Research Advisor: Fengyuan Yang, Ph.D.
- Description In this study, thin films were grown using ultrahigh vacuum of-axis sputtering techniques and characterized primarily using X-Ray Diffraction. The characterization of these films were a part of a larger ongoing investigation towards the developments of materials candidates for skyrmion activity. Thin Film growth and characterization measurements were taken at The Ohio State University (OSU) Department of Physics and on the OSU-ENSL Facilities.

### Teaching Experience

- Fall 2017- **Physics Tutor**, NMU Department of Physics, Marquette, MI.  
Present Responsibility: Tutor students who requests help with introductory physics courses.
- Fall 2017- **Mathematics Tutor**, NMU All Campus Tutoring, Marquette, MI.  
Present Responsibility: Tutor students in general mathematics.

### Academic Affiliations

- Fall 2017- **Vice President**, NMU Physics Club, Marquette, MI 49855.  
Present Responsibility: Assist with events, run meetings in place of President, club secretary. The NMU Club is in affiliation with the Society of Physics Students.
- Fall 2016- **McNair Scholar**, Ronald E. McNair Program, Marquette, MI 49855.  
Present Fellowship to prepare students for doctoral studies through research/scholarly activities.

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## Volunteer Experience

- March 2017 **Event Supervisor**, *NMU Department of Physics*, Marquette, MI.  
Responsibility: Physics demonstrations and interactive events for local Elementary School.
- April 2017, **Event Supervisor**, *NMU Seaborg Center*, Marquette, MI.  
April 2018 Responsibility: Event supervisor for Middle and High School "Science Olympiad" Competition

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## Awards

- 2016-present **Ronald E. McNair Scholar** Program for Grad School Prep and Research
- 2015-present **Dean's List** Maintained a semester GPA of 3.50 or higher.
- 2019 **Technology Innovation Award** For work in computational simulation of muon behavior in Titanium Dioxide
- 2019 **Outstanding Graduating Physics Student** For a series of competitive undergraduate research, leadership and academic performance as an undergraduate.

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## Selected Laboratory Skills

- 2017 - 2018 **MuSR**: Muon Spin Rotation, Relaxation and Resonance
- 2018 **Magnetron Sputtering**: High vacuum technique for thin film deposition
- 2018 **XRD**: Powder and Single-Crystal X-Ray Diffraction
- 2018 **SQUID/VSM**: Magnetometry techniques used in thin film characterization
- 2018 **AFM**: Atomic Force Microscopy for film/substrate surface characterization

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## Selected Computer Skills

Matlab | Maple | Origin  
Python | LaTeX | JAVA

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## Selected Research Presentations

- April 2017 **Primary Author** *Poster* "Studying Titanium Dioxide with MuSR"  
Presented at Northern Michigan University Celebration of Student Research.
- June 2017 **Co-Author** *Poster* "A First Look at Mu in Anatase TiO<sub>2</sub>"  
Presented at International Conference for Muon Spectroscopy.
- Oct 2017 **Primary Author** *Talk* "Characterizing the Mu Impurity in Anatase TiO<sub>2</sub>"  
Presented at Annual National McNair Conference
- April 2018 **Primary Author** *Poster* "Studying Hydrogen Behavior in Anatase TiO<sub>2</sub>"  
Presented at Northern Michigan University Celebration of Student Research
- April 2018 **Primary Author** *Talk* "Studying Hydrogen Behavior in Anatase TiO<sub>2</sub>"  
Presented at Annual Student Science on Tap, Marquette, Michigan
- April 2018 **Primary Author** *Talk* "First Report on the Motional Dynamics of Mu in Anatase TiO<sub>2</sub>"  
Presented at Annual Student "Science on Tap"
- July 2018 **Primary Author** *Talk/Poster* "Epitaxial Growth of Double Perovskite Thin Films"  
Presented at The Ohio State University CEM REU Symposium
- April 2019 **Primary Author** *Poster* "Simulations of Muonium Interactions in SiC and TiO<sub>2</sub>"  
Presented at Northern Michigan University Celebration of Student Research