

# CONNER DAILEY

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## EDUCATION

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### Doctor of Philosophy in Theoretical Physics

University of Waterloo, Resident of the Perimeter Institute  
Advisors: Dr. Niayesh Afshordi and Dr. Erik Schnetter

August 2020 - Present  
Expected Completion: July 2024

### Master of Science in Physics — University of Nevada, Reno

Advisor: Dr. Andrei Derevianko  
Thesis Title: “Probing exotic fields with networks of atomic clocks”

August 2017 - December 2019  
GPA: 3.845/4.000

### Bachelor of Science in Physics — University of Nevada, Reno

Advisor: Dr. Andrei Derevianko  
Minors: Astronomy and Mathematics

August 2014 - May 2017  
GPA: 3.827/4.000  
Physics GRE: 860

## PUBLICATIONS

Citations: 305 — h-index: 5 — i10-index: 5

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- **Conner Dailey**, Niayesh Afshordi, and Erik Schnetter. “Reflecting boundary conditions in numerical relativity as a model for black hole echoes” [Link](#). *Classical and Quantum Gravity*, 40(19):195007, 2023.
- Samer Afach, Ben Buchler, Dmitry Budker, **Conner Dailey**, Andrei Derevianko, et al. “Search for topological defect dark matter with a global network of optical magnetometers” [Link](#). *Nature Physics*, 17(12):13961401, 2021.
- **Conner Dailey**, Colin Bradley, Derek Kimball, Ibrahim Sulai, Szymon Pustelny, Arne Wickenbrock, and Andrei Derevianko. “Quantum sensor networks as exotic field telescopes for multi-messenger astronomy” [Link](#). *Nature Astronomy*, 5(2):150–158, 2020 (cover  $\rightarrow$ ).
- Benjamin Roberts, Geoffrey Blewitt, **Conner Dailey**, and Andrei Derevianko. “Search for transient ultralight dark matter signatures with networks of precision measurement devices using a bayesian statistics method” [Link](#). *Physical Review D*, 97(8), 2018.
- Benjamin Roberts, Geoffrey Blewitt, **Conner Dailey**, et al. “Search for domain wall dark matter with atomic clocks on board global positioning system satellites” [Link](#). *Nature Communications*, 8(1), 2017.
- S. Heck, A. Gatton, et al. “Symmetry breaking in the body-fixed electron emission pattern due to electron-retroaction in the photodissociation of  $\text{H}_2^+$  and  $\text{D}_2^+$  close to threshold” [Link](#). *Physical Review Research*, 1:033140, 2019.



## PUBLICATIONS IN PREPARATION

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- **Conner Dailey**, Niayesh Afshordi, and Erik Schnetter.  
“Reflecting boundary conditions in numerical relativity: The generalized harmonic formulation in axisymmetry”.
- Ruolin Liu, Yu Li, **Conner Dailey**, and Niayesh Afshordi.  
“Detecting cosmological scalar fields using orbital networks of quantum sensors”.

## OTHER ACADEMIC PROGRAMS

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- Symmetries Graduate School 2023** January 2023 - February 2023  
Perimeter Institute for Theoretical Physics, Waterloo, Ontario, Canada [Link](#)
- PRISMA<sup>+</sup> Internship Program** January 2020 - March 2020  
Johannes Gutenberg University, Mainz, Germany [Link](#)
- The 37<sup>th</sup> Advanced School in Theoretical Physics:  
New Ideas for Old Puzzles in Particle Physics** December 2019 - January 2020  
The Israel Institute of Advanced Studies, Jerusalem, Israel [Link](#)

## FIRST-AUTHOR CONFERENCE PRESENTATIONS

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- Midwest Relativity Meeting** November 2023  
Chicago, Illinois, USA  
Title: “Reflecting boundary conditions in numerical relativity as a model for black hole echoes” [Link](#)
- Puzzles in the Quantum Gravity Landscape** October 2023  
Perimeter Institute, Waterloo, Ontario, Canada  
Title: “Reflecting boundary conditions in numerical relativity as a model for black hole echoes” [Link](#)
- Testing Gravity 2023** January 2023  
Vancouver, British Columbia, Canada  
Title: “Reflecting boundary conditions in numerical relativity as a model for black hole echoes” [Link](#)
- APS April Meeting 2019 “Quarks 2 Cosmos”** April 2019  
Session ID: L09.00006 — Denver, Colorado, USA  
Title: “Progress in dark matter search with the global positioning system” [Link](#)
- APS Division of Atomic and Molecular Physics Meeting 2018** June 2018  
Session ID: M01.00081 — Fort Lauderdale, Florida, USA  
Title: “Searching for dark matter and exotic physics with atomic clocks and the GPS constellation” [Link](#)
- PhysCon 2016** November 2016  
Session ID: S1 - 54 — San Francisco, California, USA  
Title: “Preliminary steps in detecting dark matter with the GPS satellite constellation” [Link](#)

## CO-AUTHOR CONFERENCE PRESENTATIONS

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- APS Division of Atomic, Molecular and Optical Physics Meeting 2023** May 2022  
Session ID: F01.00151 — Spokane, Washington, USA [Link](#)  
Title: “GPS.ELF: Search for exotic low-mass field emission from the binary neutron star merger (GW170817) using GPS atomic clocks”

- APS Division of Atomic, Molecular and Optical Physics Meeting 2022** May 2022  
 Session ID: E03.003 — Chicago, Illinois, USA [Link](#)  
 Title: “GPS.ELF: Search for emission of exotic low-mass fields from the binary neutron star merger (GW170817) using GPS atomic clocks”
- APS Division of Atomic, Molecular and Optical Physics Meeting 2020** June 2020  
 Session ID: K01.00151 — Portland, Oregon, USA [Link](#)  
 Title: “Search for Exotic Field Emission from the GW170817 Binary Neutron Star Merger Using GPS Atomic Clocks”
- APS Division of Atomic, Molecular and Optical Physics Meeting 2019** May 2019  
 Session ID: S01.00035 — Milwaukee, Wisconsin, USA [Link](#)  
 Title: “Global Network of Clocks and Magnetometers as Exotic Light Field Telescopes”
- International Frequency Control Symposium** April 2019  
 DOI: 10.1109/FCS.2019.8856056 — Orlando, Florida, USA [Link](#)  
 Title: “DAMNED-DARK Matter from Non-Equal Delays New test of the fundamental constants variation”
- Rencontres de Moriond - 2019 Gravitation** March 2019  
 ISBN: 9791096879106 — La Thuile, Valle d’Aosta, Italy [Link](#)  
 Title: “The damned experiment: dark matter from non equal delays”
- APS Division of Atomic, Molecular and Optical Physics Meeting 2018** June 2018  
 Session ID: D06.00007 — Fort Lauderdale, Florida, USA [Link](#)  
 Title: “New Precision Measurements from GPS. DM Observatory for Exotic Physics Searches: Atomic Clock Phases every Second to  $< 0.1$  ns”
- APS Division of Atomic, Molecular and Optical Physics Meeting 2017** June 2017  
 Session ID: J9.00005 — Sacramento, California, USA [Link](#)  
 Title: “Searching for Dark Matter and Exotic Physics with Atomic Clocks and the GPS Constellation”
- APS Division of Atomic, Molecular and Optical Physics Meeting 2017** June 2017  
 Session ID: Q1.00023 — Sacramento, California, USA [Link](#)  
 Title: “Using Global Network Precision Measurements to Search for Exotic Physics”
- APS April Meeting 2017 “Quarks 2 Cosmos”** January 2017  
 Session ID: C6.00002 — Washington D.C., USA [Link](#)  
 Title: “First Results of the GPS.DM Observatory: Search for Dark Matter and Exotic Physics with Atomic Clocks and GPS Constellation”
- American Geophysical Union, Fall Meeting 2016** December 2016  
 Session ID: G53A-05 — San Francisco, California, USA [Link](#)  
 Title: “First Results in the Search for Dark Matter from the GPS.DM Observatory”

## TEACHING EXPERIENCE

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### Graduate Teaching Assistantships:

- ECE 105 - Classical Mechanics September 2023 to December 2023
- PHYS 360/460 - Advanced Laboratory January 2023 to May 2023
- ECE 105 - Classical Mechanics September 2022 to December 2022
- SCI 238 - Introduction to Astronomy May 2022 to September 2022

SCI 207 - Life, the Universe, and Everything	January 2022 to May 2022
ECE 105 - Classical Mechanics	September 2021 to December 2021
SCI 270 - Astronomical Observations	May 2021 to September 2021
SCI 238 - Introduction to Astronomy	January 2021 to May 2021
PHYS 181L - Physics for Scientists and Engineers II - Lab	September 2019 to December 2019
PHYS 152L - General Physics II - Lab	January 2018 to May 2018
PHYS 151L - General Physics I - Lab	August 2017 to December 2017

## **PUBLIC OUTREACH**

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<b>Kitchener/Waterloo Public Library, hour long public talk</b> Kitchener, Ontario, Canada Title: "Relativity: The secrets to visiting other galaxies and traveling in time."	September 2023
<b>Astronomy on Tap, hour long public talk</b> Kitchener, Ontario, Canada Title: "How black holes drag space and time along with them."	August 2023

## **SCHOLARSHIPS**

<b>Authur B. McDonald HQP Pooled Resources Scholarship (HQP 2021-R7-01)</b> 2022-2024
<b>International Doctoral Student Award</b> 2020, 2021
<b>Marie Curie Graduate Award</b> 2020
<b>Governor Guinn Millennium Scholarship</b> 2014, 2015, 2016, 2017
<b>TMCC/UNR Thompson Scholarship</b> 2014, 2015
<b>ASUN Academic Scholarship</b> 2015, 2016

## **HONORS AND AWARDS**

<b>Canadian Association of Physicists, Student Advisory Council Inaugural Problem Competition winner</b> 2020
<b>UNR College of Science Dean's List</b> 2015, 2016, 2017, 2018
<b>Nevada Undergraduate Research Award</b> 2016
<b>2013 UNR Physics Exam Award</b> 2013
<b>Silver Scholar Award</b> 2009

## **MEMBERSHIPS**

<b>Canadian Association of Physicists</b>
<b>American Physical Society</b>
<b>Society of Physics Students</b>
<b>Sigma Pi Sigma</b>
<b>National Society of High School Scholars</b>

## **OTHER AWARDS**

<b>Eagle Scout</b> Boy Scouts of America	April 2014
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