

# Bruno Ferrazzi, M.Sc.

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🌐 <https://uregina.ca/~bpf893/>



## Employment History

- 2019 – Now **Seasonal Teacher Assistant** University of Regina, Canada
- 2015 – 2015 **Math/Physics High School Substitute Teacher** Sao Paulo, Brazil.

## Education

- 2022 – Now **Ph.D. in High Energy Physics**, University of Regina - Canada.  
Thesis title: *TBD*
- 2019 – 2022 **M.Sc. in High Energy Physics**, University of Regina - Canada.  
Thesis title: *A Study of Mirrors for an Aerogel Ring Imaging Cherenkov Detector.*
- 2012 – 2018 **B.Sc., Materials Physics**, UNESP - Brazil.  
Honour Thesis title: *The Wave Packets Dynamics of the Quantum Harmonic Oscillator.*
- 2012 – 2017 **B.Sc., Teaching Degree in Physics**, UNESP - Brazil.

## Research Publications

### Journal Articles

- 1 M. Pavin and et al., "Measurement of proton-carbon forward scattering in a proof-of-principle test of the emphatic spectrometer," *Phys. Rev. D*, vol. 106, p. 112 008, 11 2022. [DOI: 10.1103/PhysRevD.106.112008.](#)
- 2 K. Abe and et al., "Supernova model discrimination with hyper-kamiokande," *The Astrophysical Journal*, vol. 916, 15 2021. [DOI: 10.3847/1538-4357/abf7c4.](#)

## Skills

Languages	<b>Strong reading, writing and speaking competencies for English and Portuguese.</b>
Coding	<b>Bash, C, C++, Python, Rust.</b>
Simulation & Data Analysis	<b>Geant4, ROOT, ART</b>
Misc.	<b>Academic research, teaching, L<sup>A</sup>T<sub>E</sub>X typesetting and publishing.</b>



## Miscellaneous Experience

### Awards

- 2021 **Civic Merit Award - "For An International Career in Physics"**, Lencois Paulista City Council.
- 2017 **Merit Award - "Gaussian Wave Packet Evolution in the Hydrogen Atom"**, XXIX UNESP Undergraduate Research Congress.

## Miscellaneous Experience (continued)

### Scholarships

- 2021  **UR Graduate Scholarship**, University of Regina.
- 2020  **Faculty of Graduate Studies and Research Thesis Only Scholarship**, University of Regina.



### Conferences & Congresses Presentations.

- 2023  **Measurement of Kaon-Carbon forward scattering with EMPHATIC Spectrometer (Oral)**. Winter Nuclear and Particle Physics Conference, Canada.
- 2022  **Mirror Design for an ARICH Detector in a Hadron Production Experiment (Poster)**. Canadian Association of Physicists Congress, Canada.
- 2021  **Mirror Study for an Aerogel Ring Imaging Cherenkov Detector (Oral)**. Graduate Research Conference, Canada.
-  **Optical Reflectors in an ARICH Detector for a Hadron Production Experiment (Poster)**. Canadian Association of Physicists Congress, Canada.
- 2020  **An Experiment to Measure Hadron Scattering and Production (Oral)**. Graduate Research Conference, Canada.
- 2017  **Evolution of Gaussian Wave Packets in the Hydrogen Atom: Manifestation of the Kepler's Orbits. (Oral)**. XXIX UNESP Undergraduate Research Congress, Brazil.
-  **Gaussian Wave Packet Propagation in Coulomb potential. (Oral)**. XL Congress Paulo Leal Ferreira of the Institute of Theoretical Physics, Brazil.
-  **Evolution of Gaussian Wave Packets in the Hydrogen Atom. (Poster)**. XVII UNESP Bauru's Physics Week (Organizing Committee Member), Brazil.
-  **Mean Value of the Periodic Exponential of a Linear Combination of  $t$ ,  $\sin(t)$  and  $\cos(t)$  in Terms of the Bessel Functions. (Poster)**. Regional Meeting of Applied and Computational Mathematics, Brazil.
- 2016  **Harmonic Oscillations of One-Dimensional Wave Packets. (Poster)**. XXVIII UNESP Undergraduate Research Congress, Brazil.
-  **Dynamics of Wave Packets in Quantum Systems. (Poster)**. Brazilian Physics Society Physics Meeting, Brazil.
-  **Dynamics of Wave Packets in Harmonic Oscillations. (Oral)**. III Symposium of Physics, Astronomy and Meteorology (Organizing Committee Member), Brazil.
- 2014  **Numerical Simulation of Bio-molecules Dynamics. (Poster)**. XXVI UNESP Undergraduate Research Congress, Brazil.
-  **Introduction to Numerical Simulation of the Dynamics of Bio-molecules. (Poster)**. I Symposium of Physics, Astronomy and Meteorology, Brazil.

### Internship

- 2013-2015  **High School Teaching Paid Internship**. Selected by qualifying exam.

### Undergraduate Research





- 2015-2017  **The Dynamics of Wave Packets in Quantum Systems**, Prof. Alexis Bruno-Alfonso. UNESP scholarship.
- 2013-2014  **Introduction to Numerical Simulation of the Dynamics of Biomolecules**, Prof. Andre Luiz Malvezi.

### Summer & Winter Schools








- 2018  **First Joint ICTP-Trieste/ICTP-SAIFR School on Particle Physics**.

## Miscellaneous Experience (continued)

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- 2016  Summer School of the Institute of Physics of the University of Sao Paulo.
- 2016  Winter School of the Physics Department of the Federal University of Pernambuco.
- 2015  X School of the Brazilian Center for Research in Physics.
- 2012  II UNESP's Astronomy Meeting.

### Affiliations & Committees

- 2019-Now  Hyper-K Collaboration.
-  EMPHATIC Collaboration.
- 2016-2017  MAPliC - Applied and Computational Mathematics Collaboration.
- 2016  UNESP's Faculty of Science Permanent Commission of Research.
- 2015-2016  UNESP's Physics Department Council.
- 2014-2016  UNESP's Physics Degree Council.
- 2014  UNESP's Commission for a New Physics Teaching Degree.

### Elementary & High School Activities

- 2011  Brazilian Physics Olympics Contestant
-  Brazilian Astronomy and Astronautics Olympics Contestant
-  Student Council Treasurer
- 2009  Brazilian Physics Olympics Contestant
- 2008  Silver Medal at Brazilian Astronomy and Astronautics Olympics
-  Brazilian Robotics Olympics Contestant
- 2007  Bronze Medal at Brazilian Robotics Olympics
-  Brazilian Astronomy and Astronautics Olympics Contestant
- 2006  Brazilian Astronomy and Astronautics Olympics Contestant