

Patrick Carzon



Curriculum Vitae

| pcarzon@franciscan.edu | 248-986-4026 |
https://sites.google.com/patrickcarzon

| | |
|---|----------------------|
| <u>Franciscan University</u> | <u>Home Address</u> |
| Department of Mathematics and Physical Sciences | 22936 Lake Way |
| Saints Cosmas and Damian Science Hall | Farmington, MI 48336 |

EDUCATION

| | |
|--|-----------|
| Doctorate In Physics, | 2019-2023 |
| University Of Illinois Urbana-Champaign, Urbana IL | |
| Rutgers University, New Brunswick NJ | 2018-2019 |
| Bachelors In Physics With Computer Science, | 2014-2018 |
| Lawrence Technological University, Southfield MI | |

RESEARCH EXPERIENCE

| | |
|--|-----------|
| University Of Illinois Urbana Champaign, Urbana, IL | |
| Rutgers University, New Brunswick, NJ | |
| Doctorate Student (Physics Department) | 2018-2023 |
| <ul style="list-style-type: none">Principal Investigator: Jaquelyn Noronha-HostlerDeveloped ICCING (Initial Conserved Charges in Nuclear Geometry): Initializing conserved charges in the Initial State of Heavy Ion Collisions | |
| University Of Illinois Urbana Champaign, Urbana, IL | |
| Research Assistant | 2021-2023 |
| <ul style="list-style-type: none">Principal Investigator: Julie Zilles (CROP SCIENCES)WAES (Writing Across Engineering and Science) collaboration: Investigation of writing across undergraduate physics curriculum | |
| Lawrence Technological University, Southfield, MI | |
| Undergraduate Student (Natural Sciences Department) | 2014-2018 |
| <ul style="list-style-type: none">Principal Investigator: George MoschelliRapidity Dependence of Correlations in Nuclear Collisions in UrQMD | |
| Wayne State University, Detroit, MI | |
| REU Student (Physics Department) | 2016 |
| <ul style="list-style-type: none">Principal Investigators: Sean Gavin and George MoschelliNew Observables for Measuring Rapidity Correlation Structure in Nuclear Collisions | |

RESEARCH INTERESTS

- Initial State of Heavy-Ion Collisions and connections to the Hydrodynamic Evolution of the system
 - Nuclear structure
 - Computational physics and open-source coding
 - Writing in Physics Curriculum
-

AWARDS

- University Fellowship, University Of Illinois Urbana-Champaign 2022
 - Presidential Research Award, Lawrence Technological University 2016
 - Talberg Scholarship, Lawrence Technological University 2014 – 2017
 - Honor Scholarship, Lawrence Technological University 2014 – 2017
-
-

| | | |
|----------------------|---|--|
| RESEARCH PERFORMANCE | <ul style="list-style-type: none"> • Publications – 3 Peer Reviewed Publications, 1 Manuscripts and 1 Conference Proceedings • Talks – 6 talks at conferences and universities (2 invited talks) • Service – Journal Club organizer | |
| TEACHING EXPERIENCE | <p>Mentor Teaching Assistant University of Illinois Urbana-Champaign 2022 University Physics: E&M Lab</p> <p>Teaching Assistant University of Illinois Urbana-Champaign 2019-2020 University Physics: E&M, Thermal, and Quantum Labs, College Physics: Mechanics & Heat Online Lab</p> <p>Physics And Math Tutor LTU Academic Achievement Center 2016-2018 Tutoring students in Math from Algebra through Calculus 3 and Calculus based Physics.</p> <p>Lab Assistant Lawrence Technological University 2015-2018 Set up of Physics 1 and 2 labs and development of new experiments for use in labs.</p> <p>Student Assistant LTU Extreme Science Saturday 2014-2016 Running chemistry and physics experiments for high school students.</p> | |
| MENTORING | <p>Research Advisor University Of Illinois Urbana-Champaign 2020 Guided high school students through research project and targeted sessions on professional topics</p> | |
| AFFILIATIONS | <p>ICASU (Illinois Center For Advanced Studies Of The Universe) 2021 – Present</p> <p>SCS (Society Of Catholic Scientists) 2021 – Present</p> <p>MUSES (Modular Unified Solver of the Equation of State) 2021 – Present</p> <p>SPS (Society Of Physics Students) – Member 2014 – Present</p> <p>APS (American Physical Society) – Member 2014 – Present</p> <p>ACS (American Chemical Society) – Member 2014 – 2018</p> <p>ROCK (Reaching Out to Christ our King) – Founding Member/President 2014 – 2018</p> | |
| SOFTWARE DEVELOPMENT | <p>ICCING (Initial Conserved Charges In Nuclear Geometry) 2022-Present Resulted in 1 peer-reviewed publication First code to include conserved charges for the initial condition of heavy ion collisions. Modular structure, in C++, allows easy development of new functionality that will be added in the future, specifically dynamic charge and energy evolution up to hydro dynamization. <u>Open-Source Repository:</u> github.com/pcarzon/ICCING</p> <p>March Madness Simulation 2014-2015 Ground up monte carlo simulation of march madness brackets using data from previous tournaments as seeds.</p> | |

| | | | | | |
|-------------------------------------|--|-------------------------------------|-----------|------------------------|-----------|
| COMPUTER SKILLS | <ul style="list-style-type: none"> • Programs/Languages/Operating Systems: C, C++, Java, Mathematica, Matlab, Latex, Linux, Qiskit • Coding Experience in bash scripts, Monte Carlo sampling, large code development, numerical techniques for integration/derivation, numerical methods for large arrays/matrices, reverse engineering codes | | | | |
| INVITED TALKS | <ol style="list-style-type: none"> 1. <i>ICCING on the Proverbial Cake</i>, Bielefeld University, 2021 2. <i>ICCING on the Cake</i>, Lawrence Technological University, 2021 | | | | |
| TALKS | <ol style="list-style-type: none"> 3. <i>Pre-Equilibrium Evolution of Conserved Charges with ICCING Initial Conditions</i>, 7th edition of the International Conference on the Initial Stages in High-Energy Nuclear Collisions, 2023 4. <i>Evolving Conserved Charges using Open-Source ICCING with Green's Functions</i>, APS Division of Nuclear Physics (DNP), 2022 5. <i>Initializing and Evolving Conserved Charges using Open-Source ICCING with Green's Functions</i>, 9th Workshop for Early Career Heavy-Ion Physicists, 2022 6. <i>Initializing BSQ with Open-Source ICCING</i>, 33rd Midwest Theory Get-Together, 2022 7. <i>Initializing BSQ with Open-Source ICCING</i>, 37th Winter Workshop on Nuclear Dynamics, 2022 8. <i>Importance of Multiplicity Fluctuations in Entropy Scaling</i>, Hard Probes, 2020 9. <i>Possible Octupole Deformation of ^{208}Pb and the Ultracentral v_2 –to-v_3 puzzle</i>, APS Division of Nuclear Physics (DNP), 2020 | | | | |
| POSTERS | <ol style="list-style-type: none"> 10. <i>Initializing BSQ With Open Source ICCING</i>, ICASU Conference, 2022 11. <i>Initializing BSQ With Open Source ICCING</i>, Quark Matter, 2022 12. <i>Initializing BSQ Across System Size With Open Source ICCING</i>, Initial Stages, 2021 13. <i>Rapidity Dependence of Correlations in Nuclear Collisions in UrQMD</i>, APS Division of Nuclear Physics (DNP), 2017 14. <i>New Observables for Measuring Rapidity Correlation Structure in Nuclear Collisions</i>, APS Division of Nuclear Physics (DNP), 2016 | | | | |
| ATTENDED CONFERENCES | <table> <tbody> <tr> <td>BNL RHIC & AGS Annual Users Meeting</td> <td>June 2019</td> </tr> <tr> <td>Initial Stages, IS2019</td> <td>June 2019</td> </tr> </tbody> </table> | BNL RHIC & AGS Annual Users Meeting | June 2019 | Initial Stages, IS2019 | June 2019 |
| BNL RHIC & AGS Annual Users Meeting | June 2019 | | | | |
| Initial Stages, IS2019 | June 2019 | | | | |
| PEER REVIEWED PUBLICATIONS | <ol style="list-style-type: none"> 1. Patrick Carzon, Mauricio Martinez, Matthew D. Sievert, Douglas E. Wertepny, Jacquelyn Noronha-Hostler, "Monte Carlo event generator for initial conditions of conserved charges in nuclear geometry", <i>Phys.Rev.C</i> 105 (2022) 3, 034908 2. Patrick Carzon, Matthew Sievert, Jacquelyn Noronha-Hostler, "Impact of Multiplicity Fluctuations in Entropy Scaling Across System Size", <i>Phys.Rev.C</i> 105 (2022) 1, 014913 3. Patrick Carzon, Skandaprasad Rao, Matthew Luzum, Matthew Sievert, Jacquelyn Noronha-Hostler, "Possible Octupole Deformation of ^{208}Pb and the Ultracentral v_2 –to-v_3 puzzle", <i>Phys. Rev. C</i> 102 (2020) 5, 054905 | | | | |

PEER REVIEWED
CONFERENCE
PROCEEDINGS

-
-
4. Patrick Carzon, Matthew Sievert, Jacquelyn Noronha-Hostler, "Importance of Multiplicity Fluctuations in Entropy Scaling", PoS HardProbes 2020, 387 (2020).
-
-

MANUSCRIPTS

5. Patrick Carzon, Mauricio Martinez, Jacquelyn Noronha-Hostler, Philip Plaschke, Soeren Schlichting, Matthew Sievert, "Pre-Equilibrium Evolution of Conserved Charges with ICCING Initial Conditions", arXiv:2301.04572 [nucl-th]
 6. Patrick Carzon, Mauricio Martinez, Matthew D. Sievert, Douglas E. Wertepny, Jacquelyn Noronha-Hostler, "Initial state fluctuations of QCD conserved charges in heavy-ion collisions", arXiv:1911.10272 [nucl-th]
-
-