Monica M. Rizzo

monica.rizzo025@gmail.com

Present Address
1365 W. Greenleaf Ave, Unit 3D
Chicago, IL 60626
(716) 507-3086

Permanent Address
6016 Robinson Road
Lockport, NY 14094
(716) 507-3086

RESEARCH

Interests Multimessenger astrophysics, data mining, gravitational wave parameter estimation, neutron star astrophysics

Undergraduate Research Student, Center for Computational Relativity and Gravitation at RIT, Rochester, NY
August 2017 - May 2018

Supervised by Dr. Richard O'Shaughnessy, I continued to test, improve, and optimize rapid parameter estimation techniques for use on gravitational wave data from LIGO. I additionally participated in the prelimary analysis of GW170817, and contributed to developing the set of tools used to produce the result in the GW170817 companion paper on dynamical ejecta contributions to the associated kilonova.

REU Student, CIERA Northwestern, Evanston, IL
June 2017 - August 2017

Under Dr. Vicky Kalogera and Dr. Chris Pankow, I created a set of routines based on existing literature to calculate the amount of ejected matter and resulting kilonova light curve for neutron star-black hole and binary neutron star merger events. I then assessed the effect of different nuclear equations of state on the ejecta mass distributions and light curves.

Undergraduate Research Student, Center for Computational Relativity and Gravitation at RIT, Rochester, NY
May 2016 - August 2016

Under Dr. Joshua Faber I modelled inspiralling binary neutron stars using a smoothed-particle hydrodynamics code (Starcrash) to study how the amount of matter they eject is affected by their physical parameters.

Undergraduate Research Student, Center for Computational Relativity and Gravitation at RIT, Rochester, NY
May 2015 - August 2016

I worked with Dr. Richard O'Shaughnessy on a project where we compared the capabilities of two binary inspiral models used in gravitational wave parameter estimation - a tidally corrected T4 model and an effective one-body model which includes tides. Both were used to model inspiralling binary neutron stars.

Undergraduate Researcher, RIT Physics Department, Rochester, NY
March 2015 - June 2015

Under Dr. Mishkatul Bhattacharya, I assisted Dr. Brandon Rodenburg in his work involving the optical trapping of a nanoparticle. I solved several phonon dynamics equations to determine stable regimes of cooling, and generated several figures to illustrate these regimes.

WORK EXPERIENCE

Freelance Data Analyst
May 2018 - June 2018
- Developed Python code to fulfill a contract as a data wrangler acquired through Upwork

Grader RIT Physics Department, Rochester, NY
February 2018 - May 2018
- Assisted in grading homeworks for Vibrations and Waves (PHYS 318)

Teaching Assistant, RIT Physics/Math Department, Rochester, NY   September 2015 - December 2017
  - Assisted in teaching and grading for University Physics II
  - Assisted in teaching and grading weekly workshops for Calculus A (September 2016-December 2016)
  - Assisted in teaching University Physics I to undergraduate students and graded weekly quizzes (September 2015-May 2016)

Note Taker, RIT Disability Services Office, Rochester, NY   March 2016 - May 2016
  - Took clear and detailed notes in Numerical Linear Algebra (MATH 412). Provided notes to the Disability Services Office for use by other students.

Cashier, Home Depot, Rochester, NY   July 2016 - December 2016
  - Assisted customers at item checkout and operated point-of-sale system

Office Assistant RIT Physics Department, Rochester, NY   February - May 2015
  - Performed duties of principal office assistant to aid in management of department affairs
  - Helped set up and clean up after department events

IT Intern, Aurubis Buffalo Inc., Buffalo, NY   June 2014 - February 2015
  - Helped office workers solve computer issues
  - Made considerable progress on project to update worker incentive system
  - Assisted IT employees in maintaining systems in the copper mill

ORGANIZATIONS

2015-Present	LIGO Scientific Collaboration
2015-2018	Society of Physics Students *Executive Board: Webmaster*
2015-2018	RIT Center for Computational Relativity and Gravitation
2014-2017	RIT Honors Program
2014-2016	RIT Computer Science House

EDUCATION

B.S. in Physics, Rochester Institute of Technology, Rochester, May 2018
GPA: 3.57/4.0 (Magna Cum Laude)

Undergraduate Coursework
Mathematical Methods in Physics (PHYS 320)
Classical Mechanics (PHYS 300)
Electricity and Magnetism (PHYS 411)
Numerical Linear Algebra (MATH 412)
Numerical Analysis (MATH 411)
Advanced Computational Physics (PHYS 377)
Advanced Laboratory in Physics (PHYS 316)
Boundary Value Problems (MATH 326)
Advanced Quantum Mechanics (PHYS 415)
Nuclear Physics (PHYS 424)
Introduction to Relativity and Gravitation (ASTP 760)
Astrophysical Dynamics (ASTP 617)
Advanced Physics Research (PHYS 495)

PUBLICATIONS

  - J. Lange, R. O'Shaughnessy, **M. Rizzo**. *Rapid and accurate parameter inference for coalescing, precessing compact binaries.* Available as arXiv:1805.10457.

PRESENTATIONS
Talks

- *Placing Constraints on a Neutron Star Equation of State using Heirarchical Population Inference*, APS April Meeting, Columbus, OH, April 2018
- *Neutron Stars: The Science of Love (Numbers)*, Introduction to GR Final Presentation, Rochester, NY, December 2017
- *Parameterizing the Nuclear Equation of State: An Overview of Systematics*, RIT Physics Capstone 1, Rochester, NY, December 2017
- *Constraining a Neutron Star Equation of State using Heirarchical Population Inference*, RIT Physics Capstone Prep Talks, Rochester, NY, May 2017
- *Measuring Ejecta from Inspiralling Binary Neutron Stars using Smoothed-particle Hydrodynamics*, Rochester Institute of Technology Undergraduate Research Symposium, Rochester NY, August 2016
- *Parameter Estimation of Binary Neutron Star Gravitational Wave Signals using Effective One Body Model*, Rochester Institute of Technology Undergraduate Research Symposium, Rochester NY, August 2015

Posters

- *Equation of State Effects on Binary Neutron Star and Neutron Star-Black Hole Merger Ejecta*, CIERA REU, Evanston, IL, August 2017
- *Measuring Ejecta from Inspiralling Binary Neutron Stars using Smoothed-particle Hydrodynamics*, APS April Meeting, Washington, DC, January 2017
- *Parameter Estimation of Binary Neutron Stars using an Effective One Body Model Including Tidal Interactions*, APS April Meeting, Salt Lake City, UT, April 2016

OUTREACH

CUWiP Panelist Conference for Undergraduate Women in Physics, Rochester, NY   January 2018

- Lead discussion in panels on starting undergraduate research and current topics in physics

Imagine RIT Exhibitor Imagine RIT Festival, Rochester, NY   April 2015, 2016, 2017

- April 2018, 2017 - Participated in the RIT Society of Physics Students' exhibit featuring various physics demonstrations. Presented a handmade brachistochrone curve demonstration and a handmade Van de Graaff generator
- April 2016 - Participated in the Center for Computational Relativity and Gravitation's exhibit on gravitational waves
- April 2015 - Presented a home-made Van de Graaff generator as a member of Computer Science House's group exhibit

COMMUNITY SERVICE

Student Volunteer Western NY Future City Competition, Tonawanda, NY   January 2015, 2016

- Judged and scored students' city model designs, presentations, essays, and SIM City models
- Helped organize and run the competition

Assistant Science Olympiad Mentor, Buffalo Academy of the Sacred Heart   January 2015

- Assisted students in preparing build projects for Science Olympiad competition
- Tutored and communicated study skills to students participating in exam events

COMPUTER SKILLS

Languages: **Proficient**: Python, C#, C++, Mathematica, Bash, LaTex, HTML/CSS
Familiar: Matlab, Visual Basic, Fortran, C

Software: Microsoft Office, Starcrash (J. Faber et. al.), Autodesk Maya, Photoshop, Gimp, Creo Parametric, MESA (B. Paxton et. al.), Gnuplot, SpecTECH