

University of Rochester

Summer 2023 undergraduate research in Physics, Optics and Astronomy

Grace Barner class of '24 at Duquesne University, studied galaxy morphology using machine learning with Prof. Kelly A. Douglass. She plans to enter the workforce in the field of STEM after graduation.

Layton Borst class of '25 at St. Olaf College, studied the movement of vortices in Bose-Einstein Condensates with senior graduate student Elisha Haber and Prof. Nicholas Bigelow. He plans to apply to graduate school for physics.

Delaney Cummins, class of '24 at the University of Rochester, trained neural networks to find strong gravitational lensing systems in DESI spectra with the research group of Profs. Kelly Douglass, Segev BenZvi and Regina Demina. They plan to apply to graduate school in astronomy or astrophysics.

Caleb Jennings class of '25 at Alfred University, worked toward constructing an improved magneto-optical trap by implementing a Dichroic Atomic Vapor Laser Lock setup with Prof. Nicholas Bigelow's Cooling and Trapping group. He plans on applying to grad school for physics.

Baker Hase, class of '24 at the University of Rochester, examined various correlations and trends in simulated data for the upcoming Deep Underground Neutrino Experiment (DUNE) to get the best data possible once the experiment starts running in the early 2030s with the research group of Prof. Chris Marshall.

Henry Howard, class of '24 at the University of Rochester, investigated measurement perturbed non-equilibrium currents in the Heisenberg XXZ spin chain model with Prof. Gabriel T. Landi.

Waly M Z Karim, class of '26 at the University of Rochester, simulated the next generation neutrino detectors for IceCube that enables us to detect neutrinos from Core-Collapse Supernovae with a higher sensitivity with Prof. Segev BenZvi. The simulations include the intricate configurations of the detectors, ability to directly inject neutrino flux from different Supernovae models and track the detector response and observe detector response to background events stemming from radioactive decay.

Nathan Mangus class of '24 at West Virginia University, created a simulation of an experiment conducted at the LLE that exhibits a Rayleigh-Taylor Instability with Prof. Petros Tzeferacos. He plans to apply to graduate school for computational plasma physics.

Ellie McGhee, class of '25 at Saint Louis University, worked for the FLASH Center with Prof. Petros Tzeferacos and studied the Gericke-Murillo-Schlages theory of Ion-Electron heat exchange and implemented the model into the FLASH code. She plans to apply to graduate school and study plasma physics.

Sara Moore, class of '24 at Butler University, analyzed machine learning techniques to identify large galaxies with Profs Segev BenZvi and Kelly Douglass. She intends to attend graduate school in astrophysics or mathematics.

Max Neiderbach, class of '24 at the University of Rochester, worked on quantum simulation of a lattice gauge theory with Prof. Machiel Blok.

Juan Pelaez, class of '25 at the University of Rochester, studied the nonlinear vortex dynamics in Bose-Einstein Condensates with the research group of Prof. Nick Bigelow.

Madison Ramsey, class of '25 at Washington and Jefferson College, worked on IQ mixer correction for superconducting qubits with Prof. Machiel Blok. After graduation, she plans to attend graduate school to study quantum information.

Nathaniel Santiago, class of '24 at Northeastern Illinois University, worked on improving neutrino multi-nucleon knockout models with Prof. Kevin McFarland. He plans to pursue particle physics in graduate school and academia.

Degraj Suberi class of '25 at St. John Fisher University, reconstructed the microstructure of the neutrino beam at MINERvA with Prof. Chris Marshall. He plans to apply to graduate school for high energy physics.

Josiah Tusler, class of '25 at Carleton College, studied the impact of the solar parameters within the Deep Underground Neutrino Experiment (DUNE) with Prof. Chris Marshall. He plans to apply to graduate school for astro-particle physics.