University of Rochester
Summer 2021 undergraduate research in Physics, Optics and Astronomy

Thomas Ahrens, class of '23 at the University of Rochester, studied and analyzed core-collapse supernova (CCSN) neutrino emission models for the IceCube Collaboration with Prof. Segev BenZvi.

Brendan Barrow, class of '22 at Clarkson University, studied granular materials undergoing various forms of elastic deformation to investigate properties near the jamming transition with Prof. Steven Teitel and Dr. Anton Peshkov. He plans to apply to graduate school for molecular physics.

Nate Brunacini, class of '22 at the University of Rochester, studied the influence of large-scale environment on star formation by calculating the chemical abundance gradient across galaxies with Prof. Kelly Douglass. He plans to apply to graduate school in astronomy or physics.

Mariah Carr, class of '22 at Rochester Institute of Technology, did research in the experimental optics (cooling and trapping) group of Prof. Nicholas Bigelow. She worked on Laguerre-Gaussian beams using a forked diffraction grating on a digital micro mirror device.

Grace Chiodo, class of '22 at Villanova University, worked with Prof. Kelly Douglass and Prof. Segev BenZvi to analyze the effectiveness of MaNGA rotation curve models for the DESI secondary target sample of spiral galaxies. She plans to continue her study of astrophysics and explore a career in medical physics.

Jordan Coney, class of '24 at Morehouse College, studied the development of cosmic voids and how to efficiently analog them with Prof. Kelly Douglass and Prof. Segev BenZvi. He plans to apply to graduate school in physics.

Ellie Copps, class of '23 at Middlebury College, studied the GENIE model of neutrino interactions from the MINERvA experiment to find instances where diffractive neutrino events were not properly modelled. She plans to apply to graduate school in particle physics or astronomy.

Juan Jose Garcia Vega class of '22 at Sonoma State University, studied how supernovae rates are affected in different environments with Dr. Kelly Douglass and Prof. Segev BenzVi. He plans to apply to graduate school in physics or astronomy.

Minerva Johar, class of '22 at Wellesley College, did research on autotuning gate-defined quantum dots with Prof. John Nichol's quantum nanostructure group.

Anthony LaBarca, class of '23 at the University of Rochester, studied the effects of non-principal axis rotation and obliquity on solar radiative forces in binary asteroid systems (BYORP) with Prof. Alice Quillen. In addition, he designed an apparatus to accurately

launch dice at a specified angular and linear velocity with Prof. Chris Muir. He plans to apply to graduate school for physics.

Yousef Lawrence, class of '22 at the University of Chicago, studied deceleration phase hydrodynamic instability growth in dynamic shell inertial confinement fusion designs with Dr. Valeri Goncharov and Prof. Adam Sefkow. He plans to apply to graduate school for plasma/high energy density physics.

Sonia McGaffigan, class of '23 at the University of Rochester, studied the metachronal wave synchronization of *T. aceti* by tracking the velocity of the induced flow with Prof. Alice Quillen and Dr. Anton Peshkov.

Mary McMullan, class of '22 at The College of New Jersey, in collaboration with University of Rochester graduate student Pericles Farmakis and the group of Prof. Petros Tzeferacos, integrated the SESAME Equation of State Tabulated Database into the FLASH code. She also worked with members at the Flash Center for Computational Science to analyze 3D high-fidelity FLASH simulations of the TDYNO experiments at the Laser Megajoule facility in France, the analysis of which will appear in a forthcoming publication (Khiar et al. to be submitted). She plans to apply to graduate school for computational astrophysics.

Miriam Moore, class of '22 at Swarthmore College, studied light loss in wavelength-shifting fibers for the T2K experiment and neutrino interaction cross-sections with Professor Kevin McFarland. She plans to apply to graduate school for experimental particle physics.

Angel Paz, class of '23 at the University of Rochester studied measuring the electrical conductivity of ferropericlase to investigate the possibility of dynamo generation in magma under high pressures with Prof. Miki Nakajima.

Nathan Skerrett, class of '24 at the University of Rochester, studied strategies for pattern formation control with unique boundaries with Prof. Alice Quillen.

Joe Vargas, class of '23 at SUNY Fredonia, studied the feasibility of detecting monoenergetic kaon neutrinos in the ICARUS detector located at Fermilab with Prof. Chris Marshall, and graduate student J. Smedley. He plans to apply to graduate school studying physics.