

The University of Rochester welcomes the Flash Center for Computational Science

We are pleased and excited to announce that, as of October 25, 2021, [the Flash Center for Computational Science](#) officially moved from the Department of Astronomy and Astrophysics of the University of Chicago to the [Department of Physics and Astronomy](#) of the University of Rochester.

The Flash Center is home to several cross-disciplinary computational physics research projects, anchored by the development and stewardship of the FLASH code, the publicly available high-performance computing, multi-physics simulation code that the center will continue to [distribute](#) from the University of Rochester. FLASH, developed under the auspices of the U.S. Department of Energy (DOE) National Nuclear Security Administration (NNSA) Advanced Simulation and Computing (ASC) Program, is employed by a wide international userbase, more than 3,500 scientists strong, for modeling and simulation in a broad range of application domains that span from plasma physics and astrophysics to computational fluid dynamics, high energy density physics (HEDP), and fusion energy research.

“We are thrilled to have the Flash Center and the FLASH code join the University of Rochester research enterprise and family and we want to thank the University of Chicago for working hand in hand with us to facilitate this transfer,” said [Stephen Dewhurst](#), acting Vice President for Research of the University of Rochester. “I couldn’t agree more,” added [Steven Manly](#), Chair of the Physics and Astronomy Department of the University of Rochester. “The Flash Center is an excellent fit in our department’s research and education undertakings.”

The move of the center follows the recent hires of Flash Center personnel, as well as the center’s director, [Petros Tzeferacos](#), who joined the faculty of the University of Rochester as Associate Professor of Physics and Astronomy and Senior Scientist at the [Laboratory for Laser Energetics](#) (LLE).

“We at LLE are very pleased to have both the Flash Center and Petros at the University,” said [E. Michael Campbell](#), the LLE Director. “The center will further enhance the campus interactions and research with LLE.”

Tzeferacos’s research combines theory, numerical modeling with FLASH, and laboratory experiments, to study fundamental processes in [plasma physics and astrophysics](#), [high-energy-density laboratory astrophysics](#), and [fusion energy](#). In 2019, the American Physical Society awarded him and his colleagues the prestigious [John Dawson Award](#) for Excellence in Plasma Physics Research for his work [on magnetized turbulence and fluctuation dynamo](#).

“This is a bright new chapter in the journey of the Flash Center for Computational Science,” said Tzeferacos. “I’m truly grateful to all our team members and scientists who make the center’s cutting-edge research possible and who decided to join me in our new home, the uniquely vibrant academic environment of the University of Rochester.”

Tzeferacos is the [third director of the Flash Center](#); The center was founded in 1997 at the University of Chicago under the directorship of [Robert Rosner](#) (1997-2002), the William E. Wrather Distinguished Service Professor of the Department of Astronomy and Astrophysics, followed by the directorship of [Don Q. Lamb](#) (2002-2018), Physics PhD 1974 from the University of Rochester and the Robert A. Millikan Distinguished Service Professor Emeritus in the Department of Astronomy and Astrophysics of the University of Chicago. Tzeferacos stepped into role of director of the Flash Center in 2018 after serving for five years (2013-2018) as associate director and code group leader.

“I strongly support the move of the Flash Center and the FLASH code to the University of Rochester under the continued leadership of Petros Tzeferacos,” said Rosner. “Petros has had a leadership role in the Flash

Center for nearly a decade, during which he helped lead many groundbreaking HEDP experiments,” said Lamb. “He also transformed the academic HEDP field through the HEDP capabilities he added to FLASH code, including non-ideal magneto-hydrodynamics and the ability to simulate key diagnostics, and through the training of countless young scientists to use the FLASH code to perform validated simulations of HEDP experiments. I could not be happier that he will continue to do these things at the University of Rochester.”

The continued expansion of FLASH’s physics and algorithmic capabilities by the Flash Center is supported primarily by the U.S. DOE NNSA, the Los Alamos National Laboratory (LANL), the Lawrence Livermore National Laboratory (LLNL), and the LLE, Tzeferacos explained. This expansion is in turn extending the code’s applicability into different plasma regimes, like warm dense matter and pulsed-power experiments, while concurrently pursuing a rich portfolio of research topics at the frontiers of plasma astrophysics, HEDP, and fusion that are supported through federal grants from the U.S. DOE NNSA, the U.S. DOE Advanced Research Projects Agency-Energy (ARPA-E), the U.S. DOE Office of Science Fusion Energy Sciences (FES), the National Science Foundation (NSF), and the Department of Defense (DOD) Missile Defense Agency (MDA). This is done through joint research projects with more than a dozen academic groups around the world, industry partners, and national laboratories in the U.S., the U.K., and France.

“In the last five years FLASH has become the premiere academic code for designing and interpreting experiments at the world’s largest laser facilities, such the National Ignition Facility at LLNL and the [Omega Laser Facility](#) at the LLE, here at the University of Rochester,” said Campbell. “Having the Flash Center and the FLASH code at Rochester strengthens significantly LLE’s position as a unique national resource for research and education in science and technology”.

According to Tzeferacos, the training and mentoring of young researchers is central to the Flash Center mission. In its 24 years of existence, the Flash Center has educated more than 100 postdocs, graduate students, and undergraduates in numerical modeling and code development. “The center’s robust education program is key for replenishing the NNSA workforce and for transforming the academic HEDP field so that validated simulations to design, execute, and interpret experiments are the norm,” he said.

The NNSA, which funds and supports both the Flash Center and the LLE, also welcomed the recent move of the center. “FLASH is a critically important simulation tool for academic groups engaging with NNSA’s academic programs and performing HEDP research on NNSA facilities,” said Ann J. Satsangi, federal program manager at the NNSA Office of Experimental Sciences. “The Flash Center joining forces with the LLE is a very positive development that promises to significantly contribute to advancing high-energy-density science and the NNSA mission.”

Tzeferacos is enthusiastic about the future of the center at its new home. “The Flash Center is now presented with a unique opportunity,” Tzeferacos said. “We are working hand in hand with the LLE scientists who facilitated our laboratory astrophysics breakthroughs, we are collaborating with several faculty members in Rochester’s Physics and Astronomy, Mechanical Engineering, and Computer Science departments, and we can recruit talent from some of the best undergraduate and graduate students in the nation. I’m excited to be doing all of these things!”