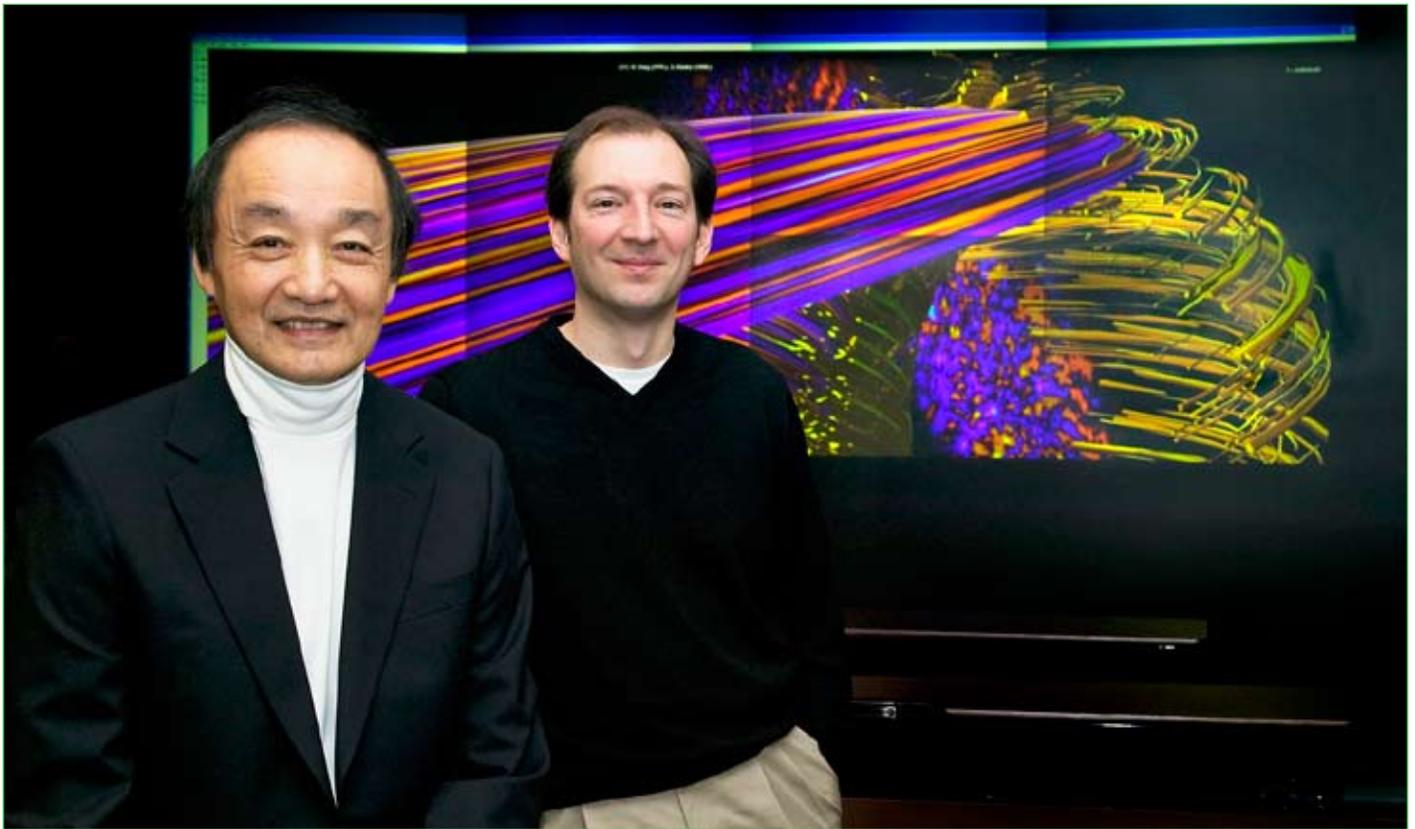


HOTLINE

The Princeton Plasma Physics Laboratory is a United States Department of Energy Facility

Two Million Hours

of Supercomputing Time Awarded



PPPL Chief Scientist Bill Tang (left) and PPPL computational scientist Stephane Ethier are at the Lab's High-Resolution Wall. In the background is a plasma turbulence simulation.

PPPPL Chief Scientist William Tang has been awarded two million processor hours on the new IBM Blue Gene/P supercomputer at Argonne National Laboratory in Illinois. He and his close collaborator, Stephane Ethier of the Computational Plasma Physics Group at PPPL, will be using the time for fusion energy related research.

Tang heads one of 55 scientific projects recently awarded a total of 265 million hours by the U.S. Department of Energy's (DOE) Office of Science. Announced January 17, the awards are made through the 2008 Innovative and Novel Computa-

tional Impact on Theory and Experiment (INCITE), a DOE program that supports computationally intensive, large-scale research projects.

"The Department of Energy's Office of Science has two of the top ten most powerful supercomputers, and using them through the INCITE program is having a transformational effect on America's scientific and economic competitiveness," DOE Under Secretary for Science Raymond L. Orbach said. "Once considered the domain of only small groups of research-

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INCITE

Continued from page 1

ers, supercomputers today are tools for discovery, driving scientific advancement across a wide range of disciplines. We're proud to provide these resources to help researchers advance scientific knowledge and understanding and thereby to provide insight into major scientific and industrial issues."

Tang's project focuses on gaining a better understanding of turbulence as a primary mechanism by which particles and energy diffuse across the confining magnetic field in toroidal fusion systems. Results from these studies may have direct relevance to the future performance of the international fusion experiment called ITER being planned for construction in France. Plasma is a hot, gaseous state of matter used as the fuel to produce fusion energy — the power source of the sun and the stars. This INCITE project will commence within the next month and extend over a year, with expected renewals in the subsequent two years.

Tang said, "My colleagues and I are grateful for the INCITE award and are excited by the opportunity to use the new IBM Blue Gene/P at Argonne National Laboratory to accelerate the pace to fresh scientific insights about the complex nature of turbulence in hot thermonuclear plasmas."

Ethier noted that a research project requiring two million processor hours would take 228 years to complete using a single processor. "With 100,000 processors working in parallel — the final configuration of the Blue Gene/P supercomputer at the Argonne National Laboratory — the same two million processor-hour calculations will take only 20 hours. The real challenge is to orchestrate the work and the communication among these 100,000 processors. If a single processor falls behind, it will slow down the others since they must work in unison. As the number of processors increases, keeping them in sync becomes quite arduous," he said.

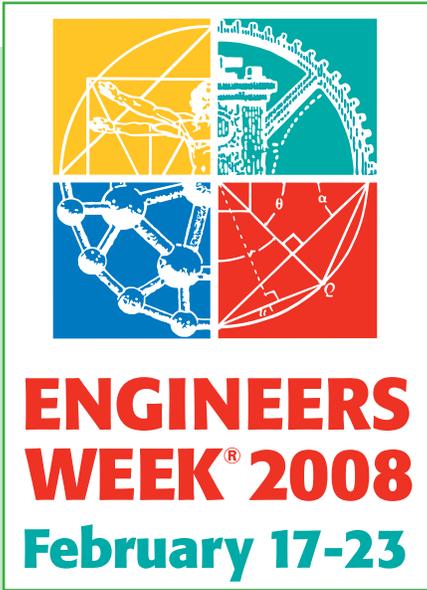
Co-investigators with Tang and Ethier on this INCITE project are Scott Klasky of DOE's Oak Ridge National Laboratory (ORNL) in Tennessee and Mark Adams of Columbia University in New York. Also, Tang said that Hal Finkel, a DOE Computational Science Graduate Fellow (CSGF) from Yale University, will be joining this effort for three months this summer to carry out his CSGF practicum project at PPPL.

In addition to his role at PPPL, Tang is Associate Director for the Princeton Institute for Computational Science and Engineering, which was recently established at Princeton University to stimulate progress in innovative computational science via interdisciplinary alliances involving computer science, applied mathematics, and prominent applications areas in the physical sciences and engineering disciplines. Tang played a prominent leadership role for the DOE's development of its multidisciplinary program in advanced computational science, SciDAC [Scientific Discovery through Advanced Computing] and chaired the SciDAC 2007 Conference in Denver.

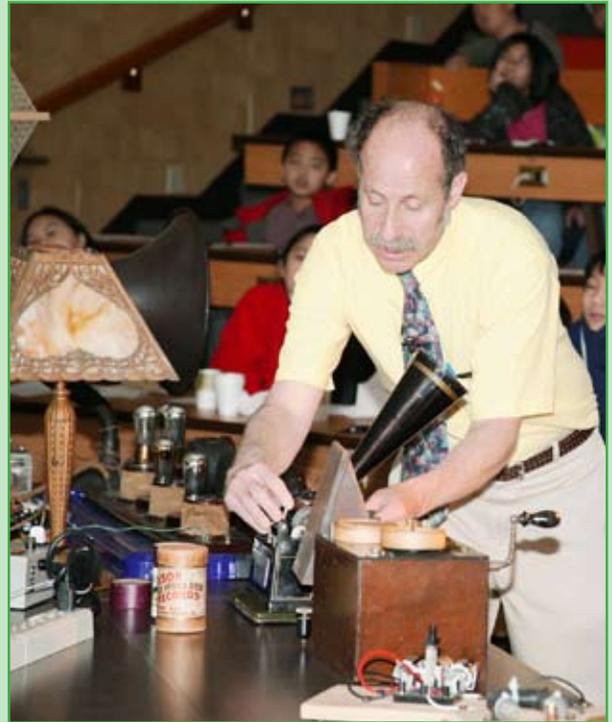
The 2008 INCITE projects were awarded time at DOE's Leadership Computing Facilities at ORNL and Argonne Laboratory, as well as at

the National Energy Research Scientific Computing Center (NERSC) at Lawrence Berkeley National Laboratory in California, and the Molecular Science Computing Facility at Pacific Northwest National Laboratory in Washington. Of the 31 new projects and 24 renewal projects selected, eight are from industry, 17 from universities, and 20 from DOE labs as well as other public, private and international researchers. Including Tang's project, Argonne will be hosting 20 INCITE projects this year on the IBM Blue Gene/P supercomputer. To read about all the 2008 INCITE awards, go to the DOE Office of Science home page at: <http://www.science.doe.gov>. ●





Princeton University Professor of Mechanical and Aerospace Engineering Michael G. Littman (right) will deliver the Colloquium, "Engineering in the Modern World," on Wednesday, February 20, at 1:15 p.m. in the MBG Auditorium as part of PPPL's Engineers Week celebration. Refreshments will be available at 1 p.m. ●



❁❁❁ *Transitions* ❁❁❁

Births



Riley Steven Mastromarino (with his big brother, Elliott) was born October 30 to PPPL's Kim Mastromarino and her husband, Jamie. ●



PPPL's Stefan Gerhardt and his wife, Jennifer Farnham, welcomed son Diedrich Warren Gerhardt on November 11. ●

HOTLINE

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Spotlight

Name: Alba Castano

Position: Castano is a Radio Frequency (RF) Operator and Technician in PPPL's Experimental Heating Systems Branch, Electrical Engineering Division. She works on RF systems during outages and operates RF sources for NSTX experiments. Castano also edits and revises procedures for RF as needed. In addition, she has supported electronics fabrication and testing efforts, as well as NCSX vacuum vessel coil wiring. Castano received an associate's degree in electronics engineering from DeVry University and worked on RF for another company before joining PPPL's staff in December of 2006.

Quote: "I always liked pulling things apart and putting them back together," says Castano, explaining that as a youngster she was intrigued by how small household appliances were engineered. One time her mother tossed out a radio that had broken and when she returned from work, Castano was listening to it. She had retrieved it from the trash, taken it apart to see what was inside, and fixed it. A week later, the blender broke and her mom told her, "Fix it."

A typical day for Castano at PPPL begins with checking e-mails and then heading to an area of the RF Building nicknamed "The Dungeon," where she and her workmates discuss the work plan for the day over coffee and then tackle projects centered around repairing, testing, and running RF heating components and instruments. Of the force that rules her job, she offers, "I have respect for electricity." Before she came to PPPL, the largest units she built measured a half-inch by two inches and the capacitors were not larger than a grain of rice. "At PPPL everything is so much bigger. When I came here I was like a kid in a candy store," Castano says.

Born in Colombia, Castano moved to the U.S. with her mother and six sisters as a teen. While she enjoyed taking apart and reassembling items, she aspired to join the medical field. "As a kid, I always wanted to be a doctor, but a math teacher convinced me I would be better at engineering," she says. "But I still like blood and guts. I like helping people, basically."

Other Interests: Four years ago, Castano found a way to fulfill her wish of serving in the medical field. She completed 140



hours of Emergency Medical Technician (EMT) training and began volunteering as an EMT in her hometown of North Brunswick. Now she is on call two nights each week — one as the primary responder and the other as a secondary responder — providing services to patients ranging from heart attack victims to expectant mothers.

"One time I delivered a baby. It was the coolest thing — scary — but great," says Castano, herself the mother of two daughters, Paola, 15, and Sandra, 12. Alba was inside the ambulance with the soon-to-be-mom. "I had my gloves on, but the OB kit was not even opened and the baby was right there," she recalled. "First I cleared out the baby's nose and throat and warmed the baby up. I put clamps on the umbilical cord and my partner — who by this time had gotten to the back of the ambulance from the driver's seat — cut the cord. Delivering that baby was definitely the best experience I've ever had as an EMT." She also is an Advance Rescue Technician, responsible for extricating patients from cars, collapsed buildings, and other places a patient can't be removed with conventional methods.

Castano also enjoys travel and camping, often pitching a tent for her and her daughters at area parks, and has coached her daughters' soccer teams.

Castano says she didn't know much about fusion when she began at PPPL, but immediately fell under its spell. "Every day I learn something new — I don't think I'll ever stop learning here." ●

Calling All Science Bowl Volunteers

Science Bowl volunteers are needed for the New Jersey Regional High School and Middle School Competitions of the National Science Bowl® on Saturday, February 23, and Saturday, April 12. Both competitions — the high school level in February and the middle school in April — will be held at PPPL. If you are interested in serving as a judge, timekeeper, moderator, or scorekeeper, please e-mail James Morgan at jmorgan@pppl.gov. No experience necessary. ●