

HOTLINE

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

PPPL's Hulse and Zwicker Honored by Physics Education Peers

PPPPL's Russell Hulse and Andrew Zwicker are among 75 chosen by the American Association of Physics Teachers (AAPT) as "notable people in physics and physics education." They and the other honorees are featured in the organization's "Celebrating 75 Years of Excellence" publication, produced to observe AAPT's recent 75th anniversary.

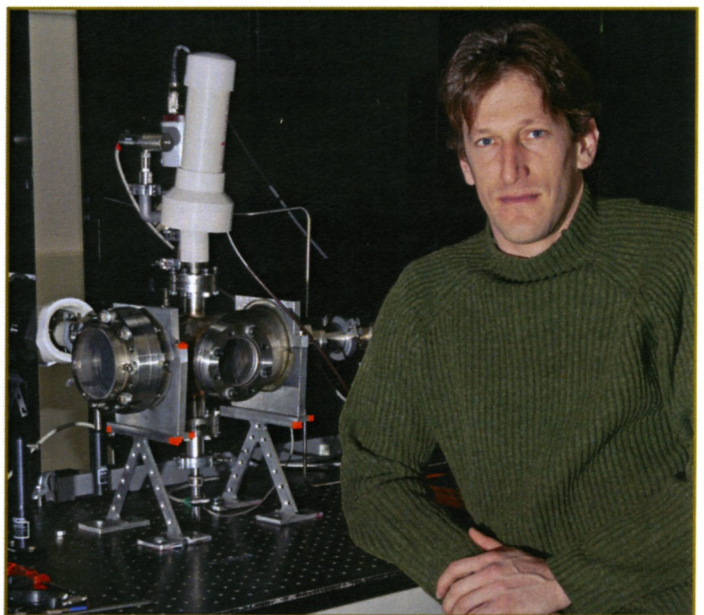
"I am humbled and honored to be included among this very distinguished cast of 75. It is especially meaningful because our peers — AAPT members — selected us," said Zwicker, Head of the Lab's Science Education Program. The honorees range from Leon Lederman, Director Emeritus of Fermi National Accelerator Laboratory, to U.S. Congressman Rush Holt and superstring theoretical physicist Sylvester James Gates, Jr.

Added Hulse, "Even though I have made science education a significant part of my activities ever since receiving the Nobel Prize, it was an unexpected honor and pleasure to be selected for this list. I was also very pleased to see that Andrew was selected. He has done a wonderful job with the PPPL science education program, and richly deserves this recognition." Hulse is a Principal Research Physicist at PPPL and winner of the 1993 Nobel Prize in Physics.

AAPT representatives wrote, "As part of the efforts to remember our historic roots and to plan for future opportunities, we thought that it would be interesting to talk to 75 people connected with AAPT or physics. We wanted to find out what developments in the past 75 years they thought were important to physics, what they remembered most about their



Above is Russell Hulse and at right is Andrew Zwicker with a Science Ed Lab experiment.



experiences in the discipline, and where they imagine the field is heading in the next 25 years." Members submitted names, and the top 75 were included.

Both Hulse and Zwicker noted that the computer has had the greatest impact on physics and physics education in the past 75 years.

"The single most important change in science education is the advent of the computer and its associated technologies, such as the web and computerized instrumentation," Hulse said.

He added that the use of computers has had negative and positive effects. "On the one hand, computers offer the opportunity for students to engage in much more exciting and open-ended investigations in both experimental and theoretical studies than ever before and, through the web, they provide enormously easier access to vast amounts of information," Hulse said. "On the other hand, there is a real

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Honored

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danger of students now approaching science as just another video game, losing the vital connection to the real natural world, and losing the habits of mind necessary to build deep knowledge and engage in the thoughtful introspection necessary for real understanding.”

Zwicker foresees an increased role of technology in physics education during the next 25 years. “I believe this is a positive thing. I also expect research on the brain and how students learn will have an impact on how we teach physics as we move increasingly from a passive format (lecture) to an active one (hands-on, constructivist),” he said.

When queried about favorite memories, Zwicker recalled being a mentor to a high school student who was working on a project at PPPL. Recognizing her promise, analytical capabilities, and thirst for knowledge and educational challenges, he helped her to get into a private school, leaving a

large, urban school. Now, many years later, she has a wonderful career and a family. “This young woman was going to succeed with or without me. But I had the opportunity to help her along her way. If I did nothing else in education, I knew I would always have this experience,” Zwicker said.

Hulse said his best memories “are those wonderful, transcendent moments when one gains real insight into how the world works.” One of his worst? “Being banned from reading science books for a period of time in elementary school so that I wouldn’t turn out ‘unbalanced,’” Hulse said.

All the honorees were asked their favorite color, and the publication noted an overwhelming response of “blue.” Zwicker, always outside the box, choose purple. Hulse, while noting the question reminded him of a certain Monty Python movie, said he had trouble answering it. “The context is undefined — it could be green, it could be red, it could be other colors, depending on the circumstances. Some psychologist will probably have a field day with this response,” said Hulse. ●

PPPL’s Hulse Joins Battelle Board

PPPPL physicist Russell A. Hulse, who shared the 1993 Nobel Prize in physics for the discovery of the first binary pulsar, has been elected to Battelle’s Board of Directors.

“All of us at Battelle are excited to have Russell Hulse join the Board,” said Carl F. Kohrt, Battelle President and CEO. “The discovery of the binary pulsar is considered by many to be among the top scientific discoveries of the 20th Century and has had vast impact on astrophysics and gravitational physics research. His experience in breakthrough science and his personal commitment to improving math and science education K-16 will add another valuable voice to our organization.”

Hulse replaces Princeton colleague John J. Hopfield, who retired from his seat on Battelle’s Board. In addition to his responsibilities at PPPL, Hulse is Associate Vice President for Research and Economic Development and a Visiting Professor of Physics and of Science and Mathematics Education at The University of Texas at Dallas (UTD).

Battelle is a global leader in science and technology. Headquartered in Ohio, it develops and commercializes technology, and manages laboratories for customers. ●

PPPL’s Meixler Chairs Security Tech Group

PPPPL Technology Transfer Head Lewis Meixler has been appointed Chair of the New Jersey Regional Homeland Security Technology Committee (NJHLSTC). The committee reports to the Director of the New Jersey Office of Homeland Security and Preparedness through the New Jersey Homeland Security Planning Group.



Lewis Meixler

The committee’s focus is to identify and evaluate technology initiatives underway within the State to enhance New Jersey’s security profile. The NJHLSTC membership represents all of the State agencies, Federal laboratories, and academic research institutions in New Jersey that are engaged in developing or evaluating technologies with potential homeland security or anti-terrorism applications. ●

Hotline

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Science-on-Saturday Series Kicks Off for 2007

This year's Science-on-Saturday wintertime lecture series at PPPL began January 27 with "Where's Waldo? – The Science and Application of GPS" by Princeton University Physics Professor Edward Groth. The talks — with topics ranging from petascale computing and detection of radioactive materials to the study of burning plasmas and deep sea exploration of frozen fire and volcanoes — will be featured on several January through March Saturdays at 9:30 a.m. in the Lab's MBG Auditorium. The free lectures are geared toward high school students, but open to everyone. Students, teachers, parents, community members, and PPPL staff and family are welcome to attend any or all of them. PPPL's Ronald Hatcher and James Morgan co-organized the series. Below is the schedule for 2007.

	Science on Saturday Princeton University Plasma Physics Laboratory Lecture Series 
January 27	WHERE'S WALDO? – THE SCIENCE AND APPLICATION OF GPS by Prof. Edward Groth, Dept. of Physics, Princeton University, Princeton, NJ
February 3	EVERYTHING'S RELATIVE & OTHER FABLES FROM SCIENCE & TECHNOLOGY, OR DON'T BELIEVE EVERYTHING YOUR TEACHERS TOLD YOU by Dr. Tony Rothman, Dept. of Physics, Princeton University, Princeton, NJ
February 10	ON THE ROAD TO PETASCALE COMPUTING by Dr. Scott A. Klasky, Scientific Computing Group: End-to-End Task Lead, Oak Ridge National Laboratory, Oak Ridge, TN
February 17	EXPLORATION OF FROZEN FIRE AND VOLCANOES OF THE DEEP SEA by Prof. Peter A. Rona, Institute of Marine and Coastal Sciences and Dept. of Geological Sciences, Rutgers University, New Brunswick, NJ
February 24	NO PROGRAM - DOE'S NEW JERSEY REGIONAL SCIENCE BOWL
March 3	REAL-TIME RADIONUCLIDE IDENTIFICATION IN DYNAMIC URBAN ENVIRONMENTS by Charles A. Gentile, Head, Tritium Systems, Princeton Plasma Physics Laboratory, Princeton, NJ
March 10	TEACHING ENGINEERING WITH ANTIQUES by Prof. Michael Littman, Dept. of Mechanical and Aerospace Engineering, Princeton University, Princeton, NJ
March 17	ITER: THE INTERNATIONAL PATH TO THE STUDY OF BURNING PLASMAS by Dr. Ned R. Sauthoff, Director, US ITER Project Office, Oak Ridge National Laboratory, Oak Ridge, TN

MRI Experimental Results Published in Nature

Princeton Physicists Test the Physics of Star Formation in the Laboratory

Nature recently published results from the Magnetorotational Instability (MRI) experiment at PPPL. The Laboratory collaborates with Princeton University's Astrophysical Sciences Department on the project.

The MRI experiment sheds light on the formation of stars and planets, one of the big questions in astrophysical

science. Presently, scientists do not understand the required conditions and the accretion, or matter collection process, involved in star and planet formation. There are contentious debates about whether hydrodynamic turbulence is responsible.

Results in the November 16th issue of *Nature* show that it is virtually impossible for hydrodynamic turbulence to generate sufficiently effective accretion to form stars and planets. The U.S. Department of Energy, NASA, and NSF are funding the work jointly.

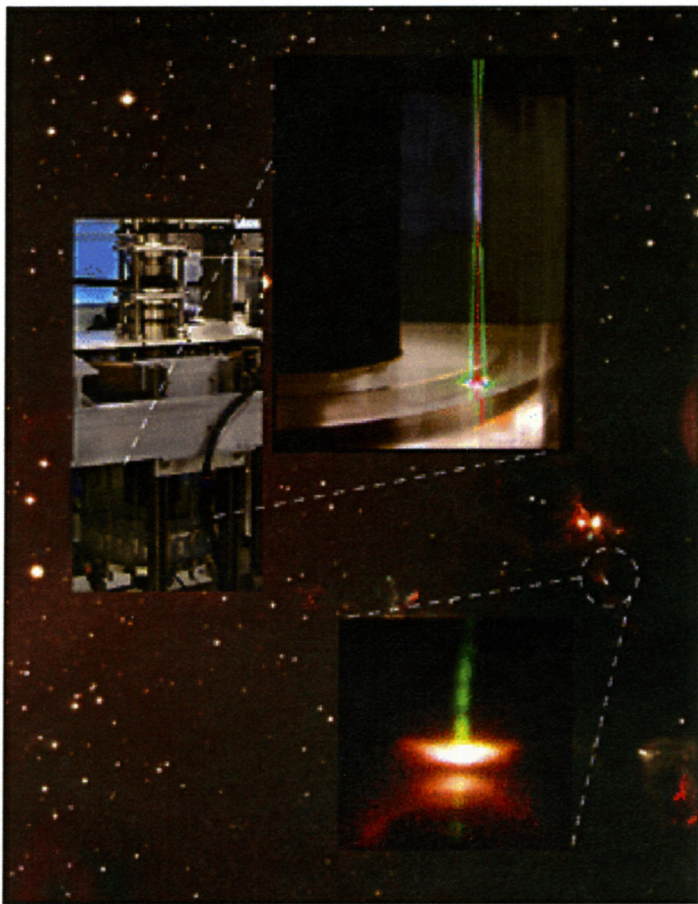
PPPL physicist Hantao Ji is the project's Principal Investigator and Jeremy Goodman is the primary collaborator from Princeton's Astrophysics Department. They are co-authors of the *Nature* paper.

Additional details of this project can be found at:

<http://mri.pppl.gov> . ●

At left is a photo of the MRI apparatus superimposed on the L1551 molecular cloud (photo credit: John Bally and David Devine, NOAO). The L1551 cloud is a star forming region which is home to HH30 shown in another superimposed image by Hubble Space Telescope (photo credit: Chris Burrows, STScI, the WFPC2 Science Team and NASA).

In the image, an accretion disk and jet in a young star are shown: the jet (in green) is perpendicular to the accretion disk, seen edge-on (and appearing on the low half of the image, as a dark region between two bright lobes). The MRI apparatus consists of six rotatable components driven independently by four computer-controlled motors. A zoomed-in photo shows two pairs of lasers (one green and one red) entering rotating water from underneath. The two lasers simultaneously measure two fluctuating velocity components to determine angular momentum transport.



**ENGINEERS
WEEK® 2007
February 18-24**

*PPPL salutes
its Engineers
during
National
Engineers Week
February 18-24.*

Send Your Story Suggestions to

HOTLINE



Hotline is looking
for news tips.
Please send your
story suggestions to
pwieser@pppl.gov



Bio-diesel Addition Helps the Greening of PPPL

They're green — inside and out. The small Gator trucks humming around PPPL's site use bio-diesel, alternative fuel considered "green."

The Lab uses a bio-diesel mix made of 20 percent plant materials and 80 percent conventional fuel. Bio-diesel is made from farm products like soybeans and rapeseed. Last year, 580 million gallons of bio-diesel were produced in the U.S and an additional 1.4 billion gallons are expected to be produced by the summer of 2008.

PPPL began using the alternative fuel through a pilot program. The John Deere Company was contacted to partner with PPPL for bio-diesel use on the Gators. "We started looking at bio-diesel about a year ago, and began researching what vehicles we could convert to bio-diesel," said Keith Rule.

Both Maintenance and Environmental Services warehouse trucks, one Chevrolet diesel work truck, and all five of the John Deere Gators use the bio-diesel mix.



PPPL's Larry Jones fills up a Gator vehicle with a bio-diesel mix.



Staff next to a Gator are, from left, Matt Lawson, Shawn Connolly, Bill Gervasi, Rob Sheneman, and Keith Rule.

"We became partners with the John Deere Company to use Gators and bio-diesel. We are doing some testing of fuels and the company provided a maintenance schedule," Rule said. The Lab is monitoring the performance of the fuel while it is in storage, as well as the performance of Gators and maintenance. "This is turning into a research project."

The pilot program kicked off the end of September. "Less than half our fleet is on bio-diesel. We want to get more vehicles on bio-diesel and eventually use regular diesel only for generators," Rule said.

So far, the trucks are running fine on the alternative fuel and the Gators are being evaluated. Since bio-diesel does not perform as well in the cold, winter storage is a large concern that may be aided by additives.

But the trend toward "greener" is worth pursuing. Rule said, "Bio-diesel is important because it reduces emissions. Sulfur, carbon monoxide, and carbon dioxide emissions are significantly less using it." ●



***Mark Your Calendars! PPPL will celebrate
EARTH WEEK
with events scheduled the week of April 15th.
Stay tuned for details.***

PPPL Applauds Tour Guides



The Lab honored its tour guides on November 30 by throwing a pizza party for them. Those who gave tours during Fiscal Years 2005 and 2006 received lunch, PPPL shirts, and certificates of appreciation from PPPL Director Rob Goldston. The honorees at the party, with Goldston (far left) and PPPL Deputy Director Rich Hawryluk (far right) are, from left, (back row) Anthony DeMeo and Chang Jun; (next row) Tim Stevenson, Mike Williams, Al von Halle, Bob Ellis, Bob Kaita, and Mike Bell; (next row) Bill Blanchard (after Goldston), Tim Gray, John Lacenere, Bill Davis, and John DeLooper (and Hawryluk); (next row) Andrew Zwicker, Patti Wieser, Charlie Gentile, and David Gates; and (front row) Bill Slavin and Ray Camp. Not pictured are George Ascione, Henry Carnevale, Doug Darrow, Eliot Feibush, Virginia Finley, Stefan Gerhardt, Geoff Gettelfinger, Nikolai Gorelenkov, Ronnie Hatcher, Mike Kalish, Ben LeBlanc, Rajesh Maingi, Tom McGeachen, Jon Menard, Martin Peng, Erik Perry, Steve Raftopoulos, Rob Sheneman, Hans Schneider, Brent Stratton, Mike Zarnstorff, Irving Zatz, and Stewart Zweben. Thank you, tour guides!! ●

Staff Required to Wear ID Badges

All PPPL staff members are required to have PPPL identification badges. Badges must be displayed at all times while on site, unless wearing a badge would jeopardize the employee's safety during a work-related activity. Badges should never be loaned to anyone. When entering an area that requires the use of a card-reader, all personnel must use their own badges to enter, even when gates and doors are opened by others; "piggybacking" is prohibited.

The PPPL Badge Office is now open Monday through Friday from 9 A.M. to Noon and 1 P.M. to 2:30 P.M. in Module VI. It can provide identification badges, access privileges, parking decals, and office keys. Please contact Dolores Stevenson at ext. 3208. ●

Calling All Science Bowl Volunteers

Help Needed February 24 and April 14

Science Bowl volunteers are needed for the New Jersey Regional High School and Middle School Competitions of the National Science Bowl® on Saturday, February 24, and Saturday, April 14. 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, time-keeper, moderator, or scorekeeper, please e-mail James Morgan at jmorgan@pppl.gov. No experience necessary. ●

New Faces at PPPL

New Hires — PPPL welcomes the following people, who joined the staff in FY06.



Lamont Watson



Neil Gerrish



Chitra Venkatraman



Michael Bernardo



Kristen Bellina



Lance Smith



Matthew Isaacs



Kyrn Jones



Joey Vargas



Jennifer Jones



Roman Kolesnikov



Tianna Dodson



Ashwini Borkar



Mark Nornberg



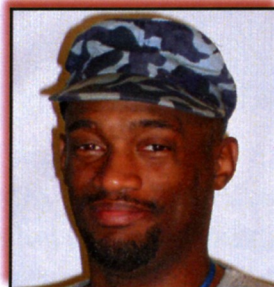
Charles Hughes



Glenn Anderson

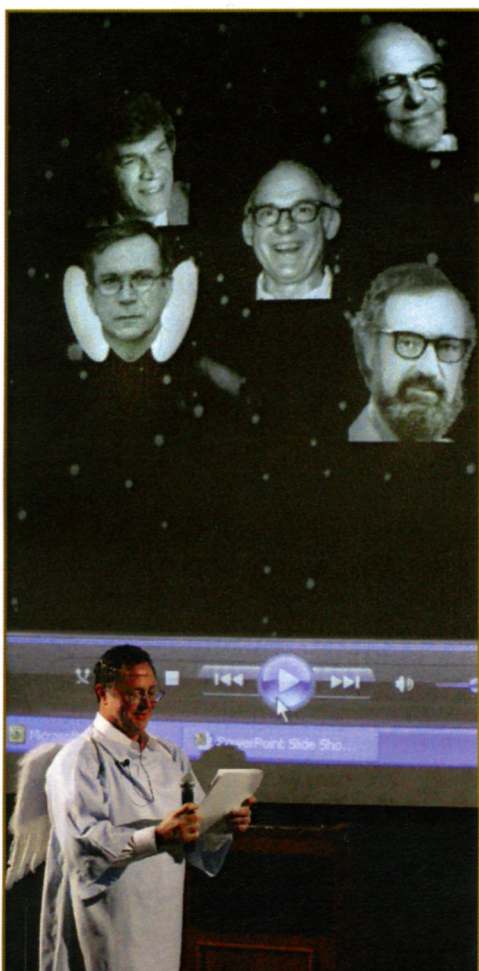


Robert Miller



Troy Hush

Festive Mood Characterizes PPPL Holiday Bash



Lunch, the holiday skit — “It’s a Wonderful Lab” — and a raffle mark the festivities at the PPPL Staff Holiday Party on December 23. Clockwise from left are Ray Camp in the skit, PPPL Director Rob Goldston with the show’s stars, Randy Wilson in holiday garb, staff in the Auditorium for the skit and raffle, and (middle) John Bennevich and Virginia Finley at the buffet. ●