

# HOTLINE

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

## PPPL Has Caught a Nice Gust of Wind



On October 22, PPPL Director Rob Goldston told staff, "We've caught a nice gust of wind — let's make the most of it." Goldston, addressing a "standing room only" crowd at the MBG Auditorium for the "State of the Lab," was referring to PPPL's budget for FY 2000. At left, Goldston discusses the national scene, the Lab's program, and internal operations with staff. Following the presentation, staff enjoyed refreshments in the Lobby (bottom photos) and congratulated the 1999 Kaul Prize winners, who were awarded during the meeting. A videotape of the Director's presentation is available to borrow by contacting Dolores Lawson at ext. 3554.



# Three Receive PPPL's 1999 Kaul Foundation Prize

## The Laboratory Recognizes Physicists Lin and Ono and Engineer Williams

**T**hree researchers at PPPL are the 1999 recipients of the Kaul Foundation Prize for Excellence in Plasma Physics and Technology Development. The honorees are physicists Zhihong Lin and Masayuki Ono and engineer Michael Williams. The trio accepted the awards during a ceremony and reception at the Laboratory on Friday, October 22.

Ono and Williams were cited "for their work leading to the construction of the National Spherical Torus Experiment (NSTX) facility ahead of schedule and within budget." NSTX began operating earlier this year. Ono is the Project Director for NSTX, as well as the Head of the NSTX Department, and Williams is Deputy Director of the Project, as well as Head of PPPL's Engineering and Technical Infrastructure Department.

Lin was honored "for performing advanced simulations with unprecedented realism and resolution leading to results demonstrating the positive impact of modern massively parallel computers and for outstanding contributions to understanding the physics of sheared zonal flows." Lin, a research physicist in PPPL's Theory Department, is involved in computer simulations relating to fusion research.

"It is a delight to be able to recognize an experimental physicist, an engineer, and a theoretical physicist this year. Their accomplishments in bringing NSTX on line within budget and ahead of schedule, and in advancing the state of the art in computational modeling using massively parallel processors are truly outstanding," said PPPL Director Rob Goldston. Goldston and Princeton University Research Board Chair Will Happer presented the citations to the Kaul Prize recipients.

The Kaul Prize is awarded by Princeton University to recognize a recent outstanding technical achievement in plasma physics or technology development by a full-time, regular employee of PPPL. It includes a cash award of \$2,000 for each of the honorees. Nominations for the award are submitted to the Prize Selection Committee,

which includes the Princeton University Provost, the Chair of the Princeton University Research Board, the PPPL Director, PPPL Deputy Director, and PPPL Chief Scientist.

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**— Rob Goldston**

Former PPPL Director Ronald C. Davidson created the prize by directing that \$40,000 of the \$100,000 gift he received as the 1993 recipient of the Award for Excellence in science, education, and physics from the Kaul Foundation be given to Princeton University to endow the Kaul Foundation Prize for Excellence. Earlier this year, the Kaul Foundation gave \$60,000 to PPPL to supplement the endowment for the Laboratory's Kaul Prize. This is the third time the prize has been given.

### Lin

Lin received a bachelor's degree in physics from Beijing University in Beijing, China in 1989. He came to PPPL in 1990 as a graduate student and joined the research staff in 1997 after receiving a Ph.D. in plasma physics from Princeton University in 1996.

## HOTLINE

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The **HOTLINE** is issued by the Princeton Plasma Physics Laboratory, a research facility supported by the United States Department of Energy. It is primarily an internal publication. Correspondence and requests to reprint material should be directed to the Editor, PPPL HOTLINE, P.O. Box 451, Princeton, NJ 08543; Interoffice correspondence should be addressed to Room B366, LSB Bldg., C-Site; fax 609-243-2751; telephone 609-243-2757; e-mail pwieser@pppl.gov



*From left are PPPL Director Rob Goldston with 1999 Kaul Prize recipients Zhihong Lin, Michael Williams, and Masayuki Ono, and Princeton University Research Board Chair Will Happer. Goldston and Happer presented the citations for the Kaul Foundation Prize for Excellence in Plasma Physics and Technology Development to the recipients during a ceremony at PPPL on Friday, October 22.*

Lin said, “This is really an award for the whole Theory Department in recognizing its groundbreaking work on the promising frontiers of advanced scientific computing. The excellent progress in this area of research has benefited from many key contributions from both inside and outside PPPL.”

### Ono

Ono came to PPPL as a graduate student in 1973 after receiving a bachelor’s degree in physics from the California Institute of Technology. In 1978, he received a Ph.D. in plasma physics from Princeton University and joined the research staff at PPPL. Since 1978, he has led a number of research project teams at the Laboratory, including those for the Advanced Concept Torus-I, the Current Drive Experiment, and the Current Drive Experiment-Upgrade. Ono, a faculty member of the Princeton University Astrophysical Sciences Program, is the author of more than 170 scientific papers and is a 1995 PPPL Distinguished Research Fellow.

Ono said, “I am very happy and honored to receive the Kaul Prize on behalf of the NSTX Project Team for accomplishing the NSTX Construction Project within budget and ahead of schedule. The facility is running very well thanks to the excellent engineering and physics operating team. The performance of the device actually

exceeded my own expectations! Mike and I had a great time ‘cheerleading’ the NSTX Project effort, but the success was truly due to the giant team work where a large number of people at all levels — from the Department of Energy and the DOE’s Office of Fusion Energy Science to PPPL management and staff — contributed tirelessly in a synergistic fashion. Essentially, we received much help from every part of the Laboratory, as well as from external institutions that are collaborating on the project. I am grateful to be given this opportunity to serve as the Director of this great team.”

### Williams

Williams came to PPPL in 1976 after graduating magna cum laude from Rutgers University with a bachelor’s degree in electrical engineering. At PPPL, he led several project teams, served as the Deputy Project Head of the Tokamak Fusion Test Reactor from 1992 until the project was closed down

in 1997, and has been Head of the PPPL Engineering and Technical Infrastructure Department since 1991. Williams is the recipient of the 1999 Excellence in Fusion Engineering Award from Fusion Power Associates and of the 1993 Fusion Technology Award from the Institute of Electrical and Electronic Engineers-Nuclear and Plasma Sciences Section’s Standing Committee on Fusion Technology.

Upon receiving the prize, Williams said, “The success of NSTX was the result of a lot of hard work by a number of people. The schedule was tight and the budget was lean, but the team managed to overcome all the typical construction and startup obstacles, making steady progress one day at a time. We are lucky to have had the support of such a talented and dedicated staff.”●

**Hotline** depends on you for tips and story ideas. If you have a co-worker who has an interesting hobby, is involved in a special project, or received an award, send an e-mail to [pwieser@pppl.gov](mailto:pwieser@pppl.gov).

# Putting the Pieces Back Together

## PPPL's Pysher Joins Volunteer Group in Restoring a World War II Black Widow Fighter Plane

By Patti Wieser

**M**ore than 50 years ago, a P-61 Black Widow fighter plane crashed into a mountaintop in Indonesia. Today, PPPL retiree Ray Pysher is working with a team to put it back together. "We are rebuilding this plane to fly again. I'm working on all the wiring," says Pysher.

Pysher, who continues to work part-time on the Magnetic Reconnection Experiment (MRX) at PPPL, takes off for Reading, Pennsylvania, one day each week to work with a group of volunteers restoring the Black Widow.

The project at the Mid-Atlantic Air Museum in Reading, which is a 90-minute drive away, attracts a group of other aircraft aficionados from all around the region. "At any given time, there are 10 to 15 volunteers working on the plane," says Pysher. He describes the restoration as "a labor of love" for the volunteer group.

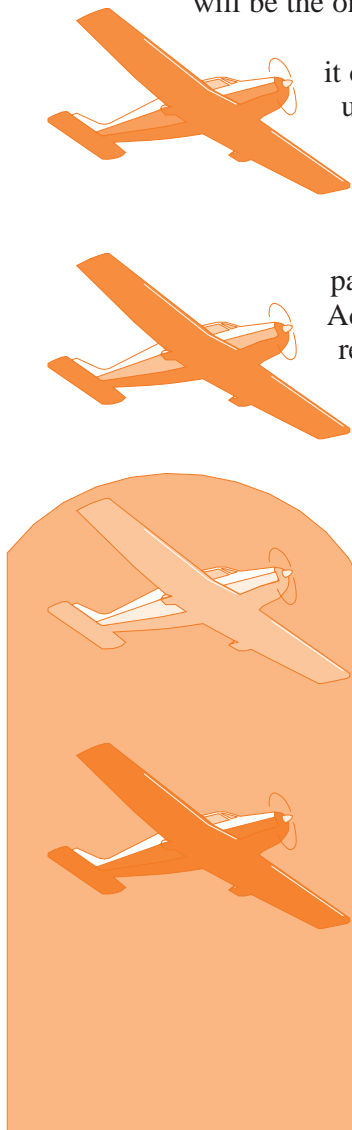
He began working on the Black Widow restoration about a year and a half ago, after a retired Air Force buddy tipped him off while Pysher was volunteering at the Air Victory Museum in Medford. Pysher expressed an interest in seeing the wrecked plane — also called a night fighter — and the restoration. Once seen, he signed up to do one day a week of volunteer work at Reading. The ultimate goal of the project is to restore the Black Widow to flying condition. "It will be the only P-61 aircraft flying in the world," says Pysher.

The model in Reading is a 1941 vintage that had logged about 50 flying hours before it crashed into Mount Cyclops in January, 1945. At the crash site, it corroded for decades until 1991, when it was retrieved, crated, and shipped to Pennsylvania. When it is restored — the anticipated date is about five years from now — it will be flown at air shows. Pysher hopes the air shows featuring the Black Widow will raise money that can be used to restore other planes, and that the exhibitions will interest youngsters in aircraft.

Restoring the night fighter to its original configuration is no easy task. Many of the parts available and the present technology are much different than they were in the 1940s. According to the Mid-Atlantic Air Museum's website, 17 rolls of microfilm provided the reference source for volunteer draftsmen to create drawings needed to construct many parts. Special fixtures were manufactured to hold the fuselage, nacelles, stabilizer, fins, tail booms, and wings. Manufactured to extremely close tolerances, the fixtures took hundreds of person-hours and more than \$5,000 to produce. The actual reconstruction work began in 1995. The anticipated total cost of the recovery and restoration is \$1.2 million. Pysher adds that the restoration team searches through books for parts, often using funds from corporations for purchases or seeking parts donations from aircraft corporations. The group uses data from the Smithsonian, including drawings and prints of aircraft from the manufacturer, Northrop, as well as referring to the microfilms and technical data books for additional information.

"It's a slow process," notes Pysher, adding that the entire project is being overseen by museum Director Gene Strine, known affectionately as "Pappy."

By next year, the Black Widow should be up on its wheels, and then it will probably take another four years to get it in the air. Pysher's one regret is not being able to spend more time working on the plane. "I just wish it were closer—I'd prob-



ably be there every day,” he says.

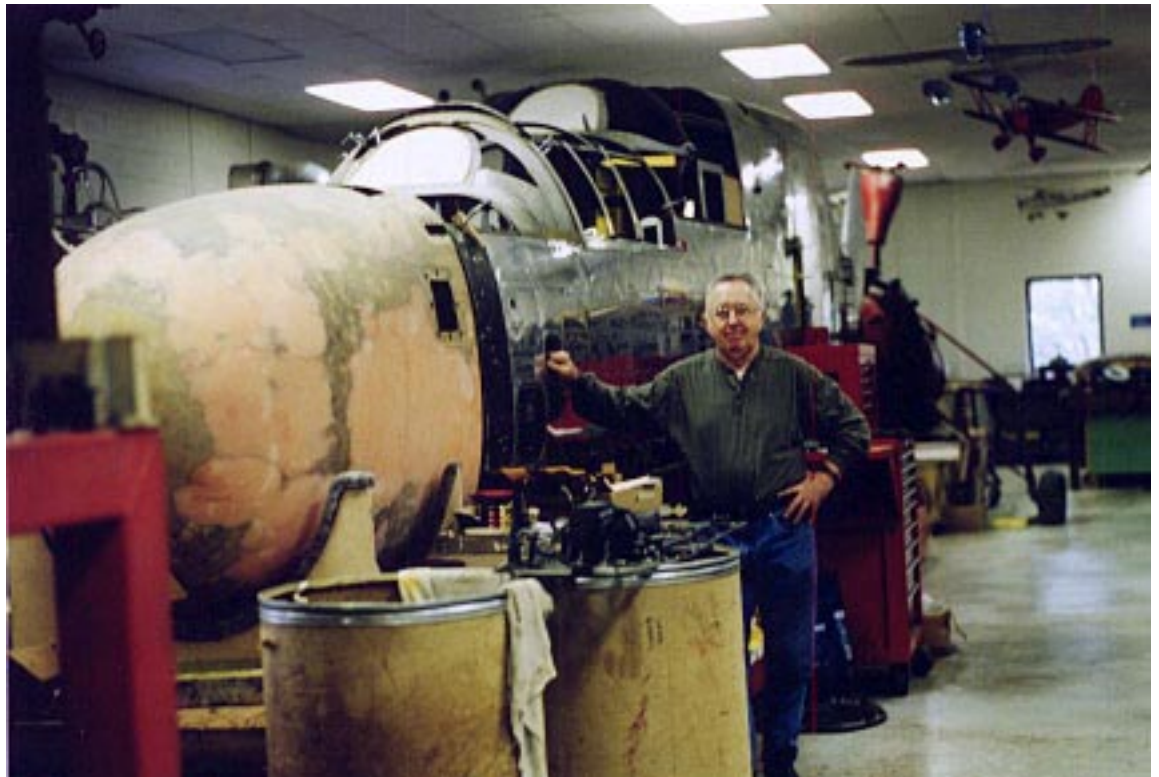
The PPPL retiree has had a long romance with aircraft, beginning as a youngster who built model airplanes. Later, he served as an aircraft electrician and supervisor in the U.S. Air Force for 23 years before joining the staff at PPPL in 1983 to work on the S-1 Spheromak.

Pysher has worked on all sizes of airplanes, from cargo planes to bombers to fighters. And he continues

his childhood hobby of model building to this day. “I’ve made a model of every aircraft I’ve ever worked on, from B-52s to fighter planes,” he notes.

His latest work as a volunteer, he says, “allows me to give back what I’ve learned in the past about aircraft.”

In 1997, he retired from PPPL after running the cooling system for the Tokamak Fusion Test Reactor. These days, he can be seen once or twice a week in the L-wing, where he is helping PPPL physicist Masaaki Yamada



Ray Pysher is at work on the restoration of the P-61 Black Widow.

with the upgrading of MRX. During his weekly volunteer stint in Reading, he focuses on what he calls “the nerve system of the aircraft.” This includes the electrical systems and instrumentation, as well as everything that interfaces with them. Pysher and one other volunteer are working on the wiring portion of the project.

“It’s going to be quite a thing when we get finished,” says Pysher of the Black Widow restoration. “I just hope I’m around to see it fly.” ●

**THE P-61 BLACK WIDOW** is of interest for a number of reasons besides its rarity. It was America’s first night fighter designed for the role. From a design begun in 1940 came an aircraft as large as some medium bombers, but capable of 350-plus speeds, a take-off roll of 1,000 feet and landing speeds of 70 to 80 mph. It featured slotted wing flaps and “spoiler” type ailerons for better control at all speeds. P-61s performed well in both theatres of World War II and one was credited with the last kill of the conflict. P-61s were also used in the testing of early ejection seats. In 1980, the Mid-Atlantic Air Museum began endeavoring to recover P-61 42-39445 to bring it to the Reading facility and restore it to flying condition. Recovery rights were granted by the government of Indonesia after five years of negotiation. Over the course of several expeditions and 10 years, the aircraft was disassembled, a helicopter landing pad was constructed,

the P-61 was removed from the mountain, crated, and prepared for shipping. This was not an easy job — besides the difficult terrain, a tribal leader staked a claim to the plane and mountain, requiring intervention by the local military, the helicopter lift was a literal cliff-hanger, and yes, there are enough tales of life on top of an Indonesian mountain to fill the book, which no doubt will be forthcoming. The final leg of the journey began in February of 1991. The vessel “Darposembalin” sailed from Jayapura in February, 1991 with the P-61 aboard. The plane was transferred to a Maersk Lines vessel in Jakarta the following month and arrived in the Port of Baltimore in April, 1991. Crates containing the plane were then sent to Reading. The P-61 recovery project was successfully completed during the spring of 1991, and the reconstruction began in 1995. —from the Mid-Atlantic Air Museum website, created by Avialantic (<http://www.maam.org>) ●

# FPA Recognizes Stix and Williams

The Fusion Power Associates (FPA) Board of Directors recently honored PPPL's Thomas Stix and Michael Williams. Stix, Professor Emeritus of Astrophysical Sciences at Princeton University and former Associate Director for Academic Affairs at PPPL, received the FPA's 1999 Distinguished Career Award. Williams, Head of PPPL's Engineering and Technical Infrastructure Department, received the group's 1999 Excellence in Fusion Engineering Award.

PPPL Director Rob Goldston said of the award recipients, "Tom Stix administered the Princeton University Graduate Program in Plasma Physics when I came as a student in 1972, and Mike Williams was the chief engineer under my thesis advisor, Harold Eubank. So I have a strong basis for saying that the contributions of these two gentlemen to the field of fusion science and engineering have been pivotal to the success of our Laboratory."

Stix, cited by the FPA for "outstanding accomplishments throughout a distinguished career," is one of the pioneers of the U.S. fusion program. He received a Ph.D. in physics from Princeton University in 1953 and has spent his career working on plasma physics and fusion at PPPL since that time. In 1962, he became Professor of Astrophysical Sciences at Princeton University. Before retiring from PPPL in 1996, he held many positions at the Laboratory, including Co-head of the Experimental Division, Associate Director for Academic Affairs, and Head of the Basic Plasma Physics Group. He has served on numerous advisory committees over the years and is a Fellow of the American Physical Society. He is best known for his outstanding original contributions to the physics of plasma waves. His 1962 text, "The Theory of Plasma Waves," is one of the classics of the fusion field.

In presenting the award to Stix, Fusion Power Associates President Stephen O. Dean, stated, "In addition to his many technical contributions, Tom is also known and respected among his colleagues for his objectivity in judging the work of others and his interest in the human aspects of our field, including the training of students and the plight of less fortunate scientists in other countries."

Stix is the sixth person from PPPL to receive the FPA's Distinguished Career Award since it was created in 1987. Former Directors Melvin B. Gottlieb, Harold Furth, and Lyman Spitzer, Jr., former Deputy Director for Technical Operations Don Grove, and former Associate Director for Research Paul Rutherford are past recipients of the award.

Williams, who was honored by the FPA for "very important contributions to fusion engineering and in



Thomas Stix



Michael Williams

recognition of impressive leadership qualities," is Deputy Director of the NSTX Project. He came to PPPL in 1976 after graduating magna cum laude from Rutgers University with a bachelor's degree in electrical engineering. At PPPL, he led several project teams and served as the Deputy Project Head of the Tokamak Fusion Test Reactor from 1992 until the project was closed down in 1997. Williams has been Head of the PPPL Engineering and Technical Infrastructure Department since 1991, where he is responsible for managing all technical engineering facilities, environmental engineering, and computing resources at the Laboratory. Williams is the recipient of PPPL's 1999 Kaul Foundation Prize for Excellence in Plasma Physics and Technology Development and of the 1993 Fusion Technology Award from the Institute of Electrical and Electronic Engineers-Nuclear and Plasma Sciences Section's Standing Committee on Fusion Technology.

The FPA Excellence in Fusion Engineering Awards were established in 1987 in memory of Professor David J. Rose of the Massachusetts Institute of Technology, a pioneer in the field of fusion engineering. The awards are presented to individuals relatively early in their careers who have shown both outstanding technical accomplishment and potential to become exceptionally influential leaders in the fusion field. Past PPPL recipients of the engineering award include Charles Kessel, Wayne Reiersen, and Michael A. Ulrickson.

FPA President Stephen O. Dean presented the group's awards to this year's recipients on October 19 during the FPA's 20th Anniversary Meeting and Symposium in Washington, D.C. This year, J. Bryan Taylor and Masaji Yoshikawa joined Stix in receiving FPA Distinguished Career Awards. P. F. Peterson joined Williams in garnering the FPA Excellence in Engineering Award. ●

# TRICK OR TREAT



# Happy Thanksgiving!

