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HOT LINE
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Director Gives State-of-the-Lab Address

Charts Future, Summarizes Past Year's Accomplishments

Once again turning to a nautical theme for his 11th State-of-the-Lab address, PPPL Director Rob Goldston used 1930s cartoons to make a point: Popeye had the right attitude — all you need is spinach — and we have a lot of it at PPPL.

Goldston, delivering the December 13 talk to a standing-room-only crowd in the MBG Auditorium, summarized the past fiscal year, discussing the Lab's experiments and collaborations, on-site improvements, Business Operations, and safety record and initiatives. He concluded with the presentation of awards and personal remarks.

"NCSX is making good progress, with 14 of 18 coils completed to exacting accuracy requirements," Goldston said, adding that coil-to coil assembly starts in January. "NCSX had lots of DOE reviews, all of them successful. For example, the programmatic and scientific review committee emphasized the U.S. should have a significant stellarator presence as part of its magnetic fusion energy research program, and that NCSX would have a profound effect on international stellarator research."

Goldston said the National Spherical Torus Experiment (NSTX) had a remarkable range of excellent results this year, and PPPL has new design and construction activities under way for ITER, and is making major contributions to the ITER Design Review. He also discussed successes in Theory and smaller experiments.

The Director talked about improvements at the Lab, such as "spiffing up" the landscape, adding new gym equipment, and making PPPL "greener than ever" by reducing water usage, non-experimental energy use, and fleet fuel consumption. He praised Business Operations for "doing a great job," noting its Achievement of Excellence in Procurement Award from the National Purchasing Institute.

On safety, he said, "We are undertaking numerous initiatives to improve safety at the Lab" and noted the Lab-wide November 20 Safety Forum. He emphasized that because the Lab wants outstanding safety performance, it has to be more thoughtful about safety than other institutions. On a lighter note, the Director showed how the Lab was "having fun" and praised the "naval architects" at PPPL for building a pirate ship for the PPPL Pirate Picnic in September. He also presented this year's Employee Recognition Awards and Kaul Prizes (page 2).

At the conclusion, Goldston discussed his personal plans, standing in front of pictures of himself when he arrived at Princeton in 1972 and wearing his pirate costume at the recent picnic.

After more than 10 years at the helm of PPPL, Goldston announced that he will step down as Director to focus his efforts on fusion energy policy, on ITER, and on the next major initiatives for U.S. fusion. "I have been involved in many of fusion's big policy challenges," Goldston said. "I have now decided, however, that after these 10 exciting years, it will be better for the Laboratory — and will let me continue to put my own efforts strongly into moving fusion forward — if we find a new candidate for Director in our proposal for the next five-year contract period." Goldston will remain as Director until his successor is in place, and plans to remain at PPPL after that. The DOE is holding a national competition for a new management and operations contract for the Lab, which has been managed by the University since 1951. This competition is planned to be completed by September 30, 2008, when Princeton's current contract ends.

DOE Undersecretary for Science Raymond L. Orbach said of Goldston, "Our country, and the entire field, owe him a debt of gratitude for his scientific leadership and insight." Ray Fonck, DOE's associate director of the Office of Fusion Energy Sciences, commended Goldston for his leadership. "I have seen up close Rob's unflagging enthusiasm for fusion science and his devotion to moving it forward," Fonck said. "He has also guided the establishment of new levels of collaborations in PPPL experiments, which provides us a template for future international and national cooperative ventures."

Goldston concluded by saying, "It has been a pleasure and an honor to lead this Lab." Everyone in the MBG Auditorium left their seats to give the Director a standing ovation. A news release is at: http://www.princeton.edu. The State of the Lab is on the Director's Office web page. ●

Noted Scientists

Four PPPL Physicists Receive American Physical Society Honors

Four PPPL physicists recently received honors from the American Physical Society (APS). The APS's Division of Plasma Physics named Igor Kaganovich, Richard Majeski, and Leonid Zakharov Fellows and awarded Michio Okabayashi, along with three researchers from other institutions, with the 2007 John Dawson Award for Excellence in Plasma Physics. APS officials bestowed the honors during the society's Division of Plasma Physics annual meeting in Orlando last month. All four PPPL researchers were noted for their work in plasma physics and fusion energy.

Kaganovich

Majeski

Zakharov

Okabayashi

Dawson Award

Okabayashi, a Principal Research Physicist, was recognized for experiments leading to greater plasma stability and sustained operation of tokamaks. Okabayashi received the Dawson award with fellow recipients Edward Strait of General Atomics in San Diego, and Gerald Navratil and Andrea M. Garofalo, both of Columbia University in New York.

Fellows

Kaganovich, a research physicist, was recognized for his pioneering contributions to the kinetic theory and kinetic modeling of plasmas. **Majeski,** a Principal Research Physicist, was honored for a new approach to heating plasma with radio waves and for pioneering work in the use of liquid lithium as a renewable wall for fusion devices. **Zakharov,** a Principal Research Physicist in the Theory Department, was honored for his contributions to the theory and numerical calculations of plasma confinement devices, and for innovative ideas concerning the development of lithium-walled tokamak devices as an approach to an economic power reactor. A news release about the APS honorees is at: http://www.pppl.gov/APS_07.html ●

Employees Recognized for Enhancing the Work Environment

PPPL Director Rob Goldston presented Employee Recognition Awards during the State-of-the-Lab event, honoring staff members "who not only contribute to the success of the Laboratory through their professional accomplishments, but also demonstrate personal characteristics that enhance the work environment." Princeton University's Stew Smith (far left) and Goldston (second from left) are with honorees (from left) Skip Schoen, Sue Hill, Kevin Ranahan, Connie Cummings, Tom Kozub, Darren Thompson, Bob Horner, John Bennevich, Arlene White, and Manny Fernandez. Not pictured are Bill Gervasi, Jackie Pursell, and Phyllis Roney. Recipients, who had been nominated by fellow employees, received plaques and gift certificates. ●

Kaul Prizes Awarded to Gorelenkov and Chrzanowski

Physicist Nikolai Gorelenkov and engineer James H. Chrzanowski received the Kaul Prize for Excellence in Plasma Physics Research and Technology Development during an awards ceremony at the December 13 State-of-the-Lab. Gorelenkov, a Principal Research Physicist who joined PPPL's staff in 1999, was cited for "his ground-breaking research on predictions and observations of energetic-particle-driven electromagnetic instabilities in magnetically-confined plasmas with special relevance to the ITER burning plasma experiment." Chrzanowski, who joined PPPL's staff in 1975 and is presently the Mechanical Design Branch Head in PPPL's Mechanical Engineering Division, was recognized for "developing the technology for winding and epoxy-impregnating the NCSX [National Compact Stellarator Experiment] coils, with their unusual and very complex geometries. The coils meet exceedingly demanding tolerance and electrical integrity requirements." Princeton University awards the Kaul Prize 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 $5,000 for each individual. Former PPPL Director Ronald C. Davidson endowed the Kaul Prize by giving to Princeton University a portion of the gift he received as the 1993 recipient of the Award for Excellence in Science, Education, and Physics from the Kaul Foundation. From left are Princeton University's Stew Smith, Kaul Prize recipients Nikolai Gorelenkov and James Chrzanowski, and PPPL Director Rob Goldston. ●

Reflections of a Fusion Leader

By Patti Wieser

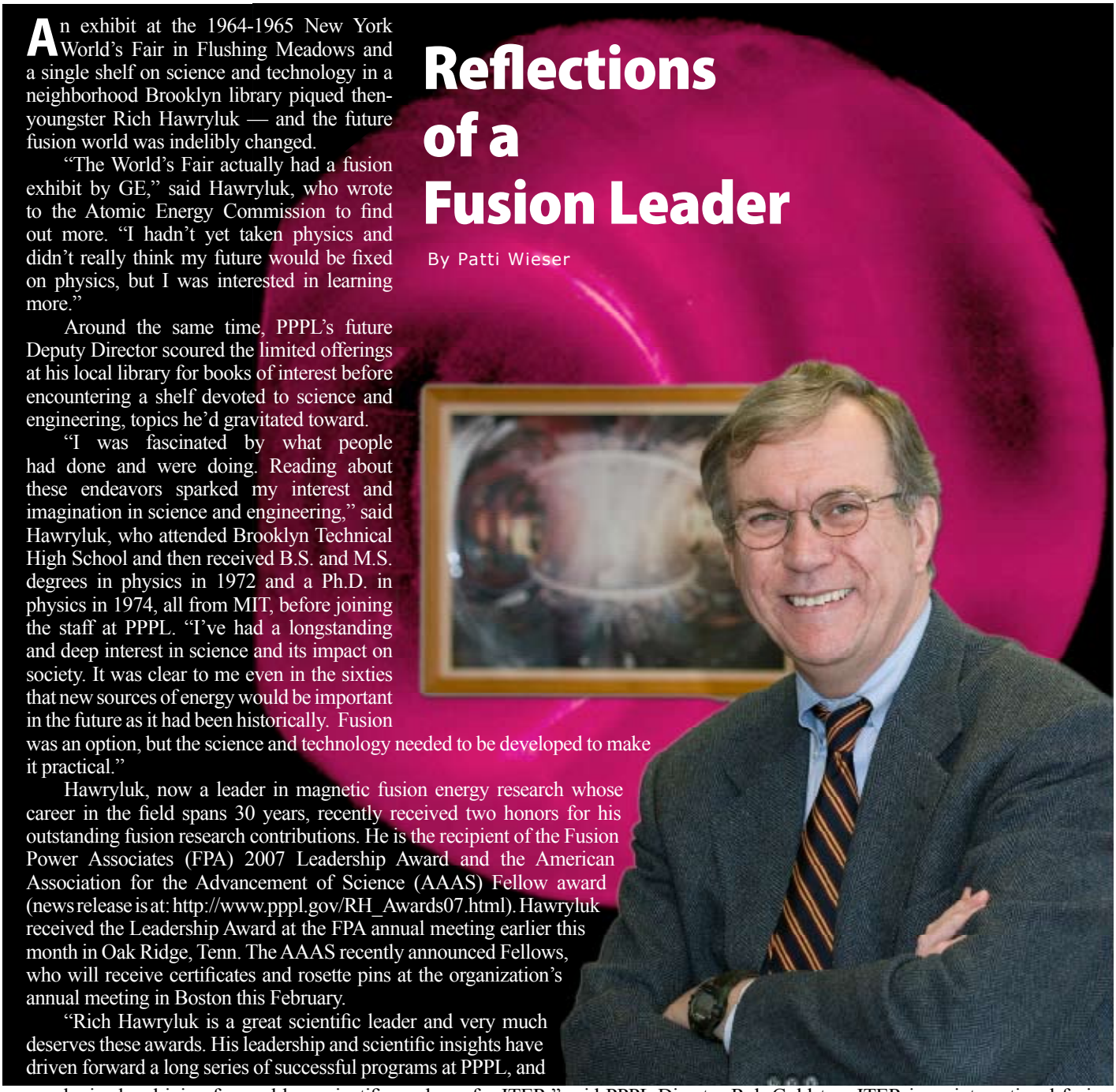

Photo composite by Elle Starkman

An exhibit at the 1964-1965 New York World's Fair in Flushing Meadows and a single shelf on science and technology in a neighborhood Brooklyn library piqued then-youngster Rich Hawryluk — and the future fusion world was indelibly changed.

"The World's Fair actually had a fusion exhibit by GE," said Hawryluk, who wrote to the Atomic Energy Commission to find out more. "I hadn't yet taken physics and didn't really think my future would be fixed on physics, but I was interested in learning more."

Around the same time, PPPL's future Deputy Director scoured the limited offerings at his local library for books of interest before encountering a shelf devoted to science and engineering, topics he'd gravitated toward.

"I was fascinated by what people had done and were doing. Reading about these endeavors sparked my interest and imagination in science and engineering," said Hawryluk, who attended Brooklyn Technical High School and then received B.S. and M.S. degrees in physics in 1972 and a Ph.D. in physics in 1974, all from MIT, before joining the staff at PPPL. "I've had a longstanding and deep interest in science and its impact on society. It was clear to me even in the sixties that new sources of energy would be important in the future as it had been historically. Fusion was an option, but the science and technology needed to be developed to make it practical."

Hawryluk, now a leader in magnetic fusion energy research whose career in the field spans 30 years, recently received two honors for his outstanding fusion research contributions. He is the recipient of the Fusion Power Associates (FPA) 2007 Leadership Award and the American Association for the Advancement of Science (AAAS) Fellow award (news release is at: http://www.pppl.gov/RH_Awards07.html). Hawryluk received the Leadership Award at the FPA annual meeting earlier this month in Oak Ridge, Tenn. The AAAS recently announced Fellows, who will receive certificates and rosette pins at the organization's annual meeting in Boston this February.

"Rich Hawryluk is a great scientific leader and very much deserves these awards. His leadership and scientific insights have driven forward a long series of successful programs at PPPL, and now he is also driving forward key scientific analyses for ITER," said PPPL Director Rob Goldston. ITER is an international fusion project being planned for construction in France.

Hawryluk was noted in the FPA award for his scientific leadership in past and present fusion projects at PPPL — including as Head of the Tokamak Fusion Test Reactor (TFTR) project when it produced record breaking results — and for his "recent involvement with the ITER Working Groups that are providing much needed input for final design decisions for ITER."

"One of the things I've enjoyed most about PPPL is the range of opportunities I've had here, from being a physics operator of the Princeton Large Torus physics to leading the TFTR experiments, to simulations and managing operations at the Lab," Hawryluk said. His proudest accomplishment? "The deuterium-tritium experiments on TFTR were challenging, exciting, and extraordinarily rewarding."

Outside work, Hawryluk enjoys spending time with his family, including wife, Mary Katherine — whom he describes as "a tremendous source of support" — and sons David and Kevin. He is an avid reader, preferring biographies, *The First American – The Life and Times of Benjamin Franklin* and *Alexander Hamilton*, and non-fiction, *The World is Flat: A Brief History of the Twenty-first Century, Guns, Germs and Steel: The Fates of Human Societies*, and *Conquering Gotham – A Gilded Age Epic: The Construction of Penn Station and Its Tunnel*, which are recent reads. Mystery and spy novels sneak into his reading repertoire on long plane trips.

He lauded the PPPL staff for its accomplishments, dedication, enthusiasm, strong motivation to address the scientific challenges of fusion research, and continual support in this effort. "I have an extraordinary respect and appreciation for the people here at the Lab." ●

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Photo by Elle Starkman

Stellarator Coils Shape Up

PPPL technician Doug Voorhees (above) is installing chill plates on a modular coil at PPPL's National Compact Stellarator Experiment (NCSX) Coil Winding Facility. The machine is being built at PPPL in partnership with Oak Ridge National Laboratory, with operations expected to begin in 2011. The stellarator's 18 modular field coils are among the most complex, innovative electromagnets ever designed. Six each of three coil types are being fabricated. More information about the project is on the web at: http://www.pppl.gov/nationalcompactstellarator.cfm ●