

## Fisch Wins APS Award

Professor Nathaniel J. Fisch has been named the 1992 winner of the Award for Excellence in Plasma Physics Research by the American Physical Society. The award was presented to Fisch at a ceremony during the 1992 Annual Meeting of the Division of Plasma Physics held in Seattle, Washington recently.

The prize, which recognizes an outstanding recent achievement in plasma physics research, is awarded to either a research team or an individual and includes a \$5000 cash prize.

Said PPPL Director Ronald Davidson, "The selection of Professor Fisch for this prestigious award by the American Physical Society is highly deserved and brings honor and distinction to both the recipient and the Laboratory."

Fisch currently directs the Program in Plasma Physics in the Department of Astrophysical Sciences at Princeton University. He joined PPPL in 1978, after obtaining the B.S., M.S., and Ph.D. degrees and postdoctoral experience at the Massachusetts Institute of Technology.

### Noninductive Current

Fisch was recognized for his "fundamental theoretical investigations of noninductive current generation in toroidally confined plasmas." His pioneering theories correctly predicted that radio-frequency waves can be used to generate continuous electrical currents in tokamak plasmas.

Usually, an electric current of limited duration is induced in tokamak plasmas by a time-varying magnetic field. This current is essential, helping to confine and heat the plasma. Fisch's theories, which

were at first controversial, predicted that it is possible to drive a continuous current indefinitely and at lower cost by introducing radio-frequency waves into the plasma.

Now, radio-frequency current drive has become an important component in almost every tokamak program worldwide. For example, during the past two years, the two largest tokamaks outside the United States—the JT-60 in Japan and the JET in Europe—reported over two million amperes of radio-frequency driven current. Two million amperes is very close to what would be needed to drive an actual fusion reactor.

Continuous generation of current is important because it allows the tokamak to operate at a steady-state (continuously) rather than in a pulsed mode. Such steady-state operation is considered advantageous because it avoids the likelihood of plasma disruptions and reduces the heat and mechanical stresses caused by turning the machine on and off frequently. The reduced wear and tear on the machine and reduced downtime are expected to result in a more economical fusion power plant.

Fisch is also recognized for his introduction of new transport quantities to mathematically describe plasmas that are far from collisional equilibrium. Such plasmas occur in tokamaks when heated by waves and in phenomena associated with noninductive currents.

Fisch gives much credit to his co-workers, especially Charles Karney, for help in developing theories of noninductive currents. Together, the two improved on the

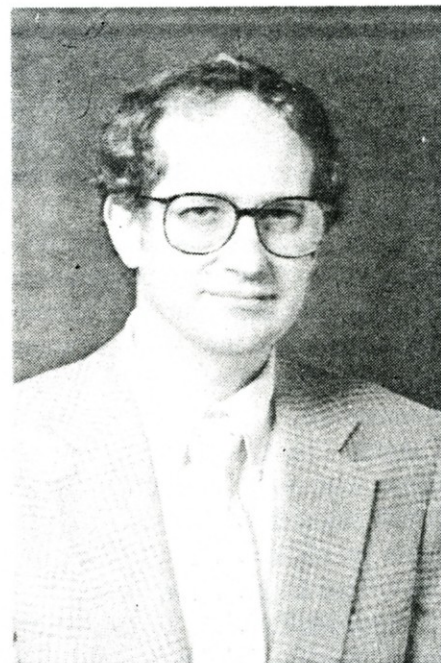


Photo: D. Applewhite

**Professor Nathaniel Fisch**

analytic theories with precise numerical calculations. Once the experiments proved successful, the two developed a way of comparing the theories with the experiments.

Says Fisch, "The close correlation between our theoretical predictions and the experimental results not only showed that the current-drive effect operated as we had predicted, but the fact that the correlation was so precise supported certain fundamental notions of how electrons behave in plasmas."

In the early 1980s, a particularly critical series of experiments done on the Princeton Large Torus (PLT) verified the accuracy of Fisch's theories. In tribute to the experimentalists who tested his theories, Fisch says, "It is one thing to have a bold theory, but without a brave experimentalist who invests time and effort to check the theory, the theory withers. Luckily, those who tested my theories were both brave and talented, and I am very grateful." ♦



# C-Site Stockroom At Your Service!

The right tools at the right time—these are key ingredients in getting the job done. Here at the Lab, staff usually have the tools and parts they need when they are needed, thanks to the high level of customer service and support given by the staff of the Stores Operations Branch of the Materiel Control Division.

Says Branch Manager Bill McCreedy, "The Stores Operations Branch includes the Stockroom, Spare Parts, and the Office Supplies sections. Our staff includes: John Bennevich, Girard Boyd, Rick Cargill, Jim Conover, and Jason Lynn, who maintain approximately 6,500 stock items and 6,000 spare parts in addition to administering the Office Supply subcontract."

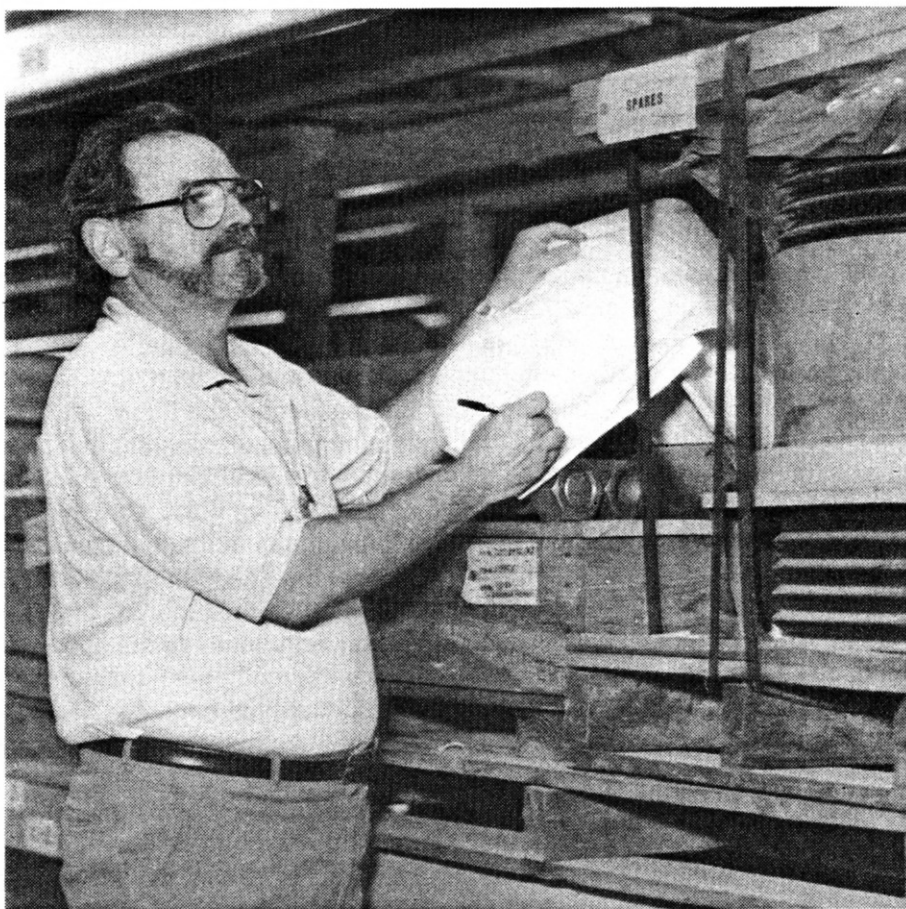
Adds McCreedy, "We've always been customer oriented, and now we're seeking to improve our support of Lab requirements even further by implementing a new Stores Operations Customer Service Program."

"Our goal is to make our customers more aware of the services we provide, to answer questions, and to respond to customer suggestions for service improvement," notes McCreedy. Anyone at the Lab who would like to have a brief presentation to learn more about Stores Operations services can contact John Bennevich at extension 3476.

## Areas of Service

### The Stockroom

Providing over-the-counter Stockroom service are Girard Boyd and Jim Conover. During the past year alone, they processed over 44,000 withdrawal requests for everything from bolts to boots. Says Conover, "Westock various electronic and electrical parts in addition to tools and other supplies in common use."



*John Bennevich checks the inventory and verifies it to the computer printout.*

According to Boyd, 70 percent of the items carried by the Stockroom are provided on a just-in-time type contract, which means that the inventory arrives at the Lab at the time it is needed and therefore does not have to be stored for long periods. Bennevich, Cargill, and Lynn provide the behind-the-scenes inventory control necessary to ensure that materials are in stock when needed.

Says Bennevich, "The just-in-time approach allows for more frequent inventory turnover while at the same time maintaining a 97 percent fill rate for Stockroom requests." He adds, "We constantly seek to establish and maintain good working relationships with our vendors as well as our users. This is all an integral part of our customer service effort."

### Spare Parts

Jason Lynn says, "In the Spare Parts area we have critical replacement parts ranging from a five-cent gasket to a coil worth \$500,000. Such parts are extremely important to the ongoing operation of many of the Lab's major systems."

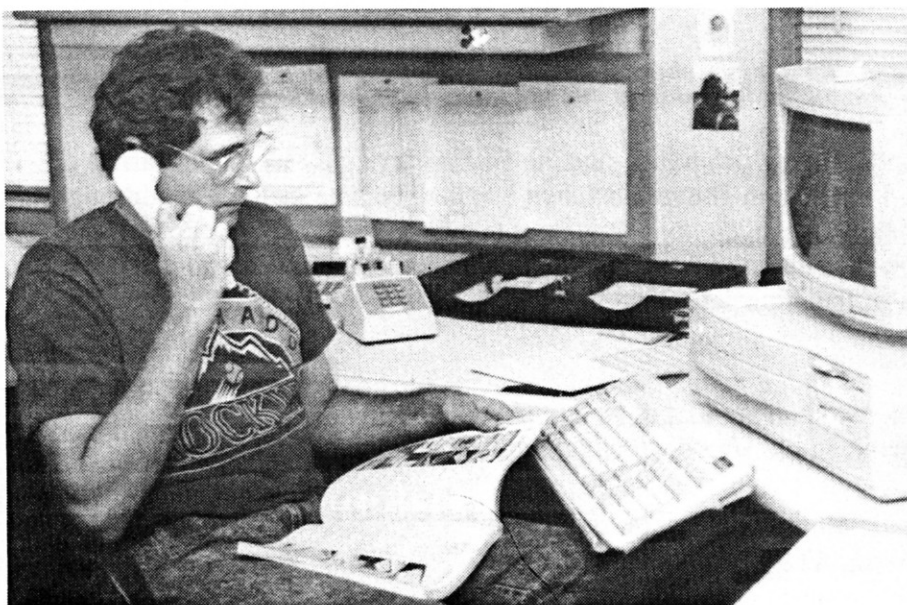
Lynn administers the spare parts inventory for TFTR, Engineering, and facilities maintenance. Parts listings are available in Room 100 of the warehouse. Lynn also orders the commercial grade and specialty gases for Laboratory project use.

### Office Supplies

Rick Cargill is the Lab's first-line contact with Philadelphia Stationers, which has been PPPL's of-

*continued on page 3*

Photo: D. Krause



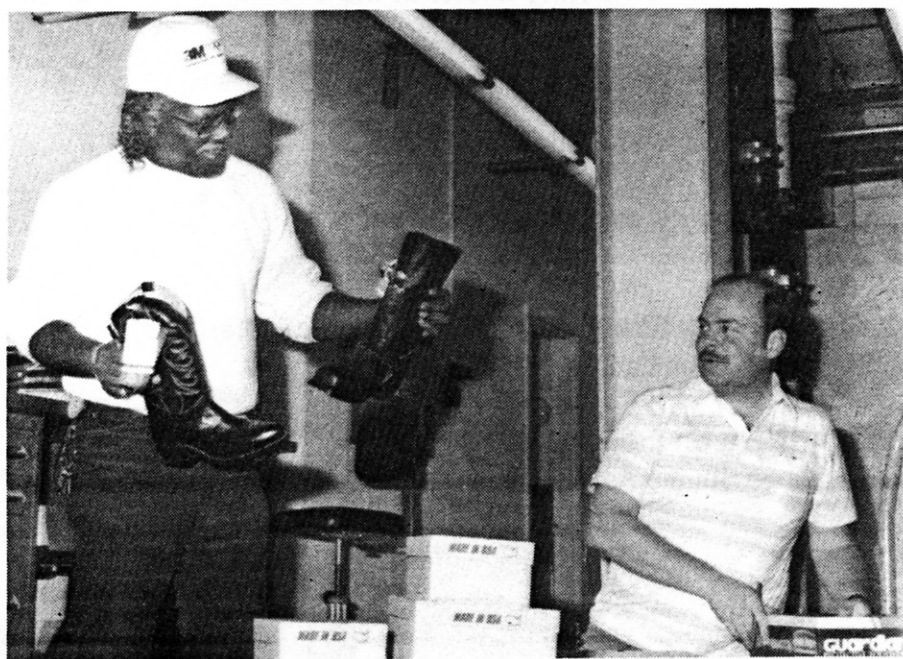
**Rick Cargill checks a back order item from Philadelphia Stationers for a customer.**

fice supply vendor for the last five years. Office supplies orders are usually delivered to the customer's desk within 48 hours—with a 98 percent fill rate.

Says Cargill, "To ensure that service remains high and vendor billings are accurate, I conduct random visits to Lab users to review vendor performance and billing accuracy. In addition, a Philadelphia Stationers representative is on site weekly

to answer questions anyone may have concerning their office supply needs."

McCreedy sums up the emphasis on customer service by saying, "Clear communications are key to everyone's satisfaction. That's why we do our best to communicate effectively with vendors, suppliers, and customers. I encourage anyone who has a question, suggestion, or creative idea regarding customer service to contact John Bennevich." ♦



**Girard Boyd (right) and Jim Conover look over newly arrived footwear for the Stockroom.**

## Equipment Sharing

When you need a piece of equipment, you may be able to get it from on-hand assets found through the PPPL Property Data Base, according to Chris Gillars, Head of Materiel Control. Says Gillars, "Equipment sharing is useful for items needed quickly or temporarily, and it can be a money-saver."

To participate in equipment sharing, please contact Trevor Bayes (ext. 2724) with a description, quantity, and length of time the item is needed. Bayes will then use the property data base to identify and locate the item and discuss its current usage with the responsible party.

Explains Bayes, If the equipment you requested is on hand, I will provide you with needed information so that you can contact the owning department to ascertain whether the equipment is available for temporary or permanent transfer on a schedule that meets your needs."

When you borrow an item temporarily from the owning department, they are responsible for recording and tracking the transfer. If the transfer is to be permanent, you should coordinate the process with Bayes so that he can update equipment records on the data base.

If you need a hard copy listing of all Laboratory equipment or selected groups of equipment, please request a list from Bayes. His extension number is 3024, C-Site Facilities Engineering.

You may also find equipment you need right at your computer terminal through the Excess Property Data Base. According to Gillars, the data base lists property available from the Department of Energy (DOE) that can be transferred to PPPL for the cost of shipping only.

The data base is stored on the VAX computer in the subdirectory USER3:[tbayes.excess]. Information on the contents of the data base and instructions are located in a file titled [README:].

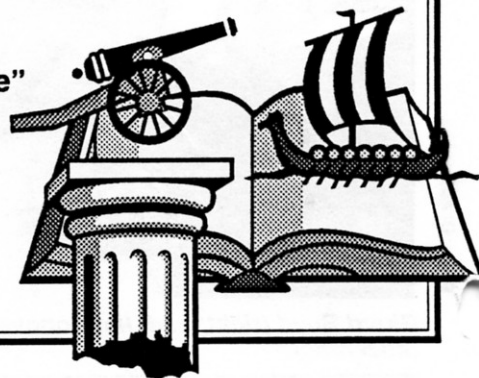
Questions on availability or transfer of property may be directed to Matt Lawson, ext. 2716. For detailed information on the VAX systems, contact Jack Abratis, ext. 3004, or send e-mail to GRIPE. ♦



## Science on Saturday Schedule Set

On tap for the 1993 Science on Saturday programs starting in January is a fascinating array of presentations that have been set up by Norton Bretz and Larry Lagin. The free programs, although geared towards high school students, are open to everyone—teachers, parents, and community members alike. Certificates will be given to students who attend all the sessions. Refreshments will be provided by the local Chapters of the American Vacuum Society.

- January 9**      ***Nuclear Physics: "A New Era in Nuclear Physics"***  
Professor Warren Buck, Hampton University
- January 16**    ***Neuroscience: "Memory Storage in Brains"***  
Dr. Alan Gelperin, AT&T Bell Laboratories
- January 23**    SAT's — No Program
- January 30**    ***Physics: "The Physics of Sport"***  
Professor Peter Brancazio, Brooklyn College
- February 6**    ***Engineering: "Light and Semiconductors—From Solar Cells to Microlasers"***  
Dr. Janet Saylor, AT&T Bell Laboratories
- February 13**   ***Astrophysics: "Black Holes, Quasars, and the Universe"***  
Professor Neil Tyson, Princeton University
- February 20**   ***Astrophysics: "NASA's COBE Satellite Looks at the Big Bang"***  
Professor David Wilkinson, Princeton University
- February 27**   ***Biology: "The Origins of Cancer in Humans"***  
Professor Arnold Levine, Princeton University
- March 6**        ***Plasma Physics: "Fusion Energy" (plus PPPL Tour)***  
Dr. Robert Goldston, Princeton Plasma Physics Laboratory
- March 13**      ***Materials Science: "Surface Studies of Microelectronic Materials"***  
Dr. Ronald Roberts, AT&T Bell Laboratories
- March 20**      ***Space Science: "A Flight on the Space Shuttle"***  
Bob Cenker, U.S. Space Shuttle Astronaut



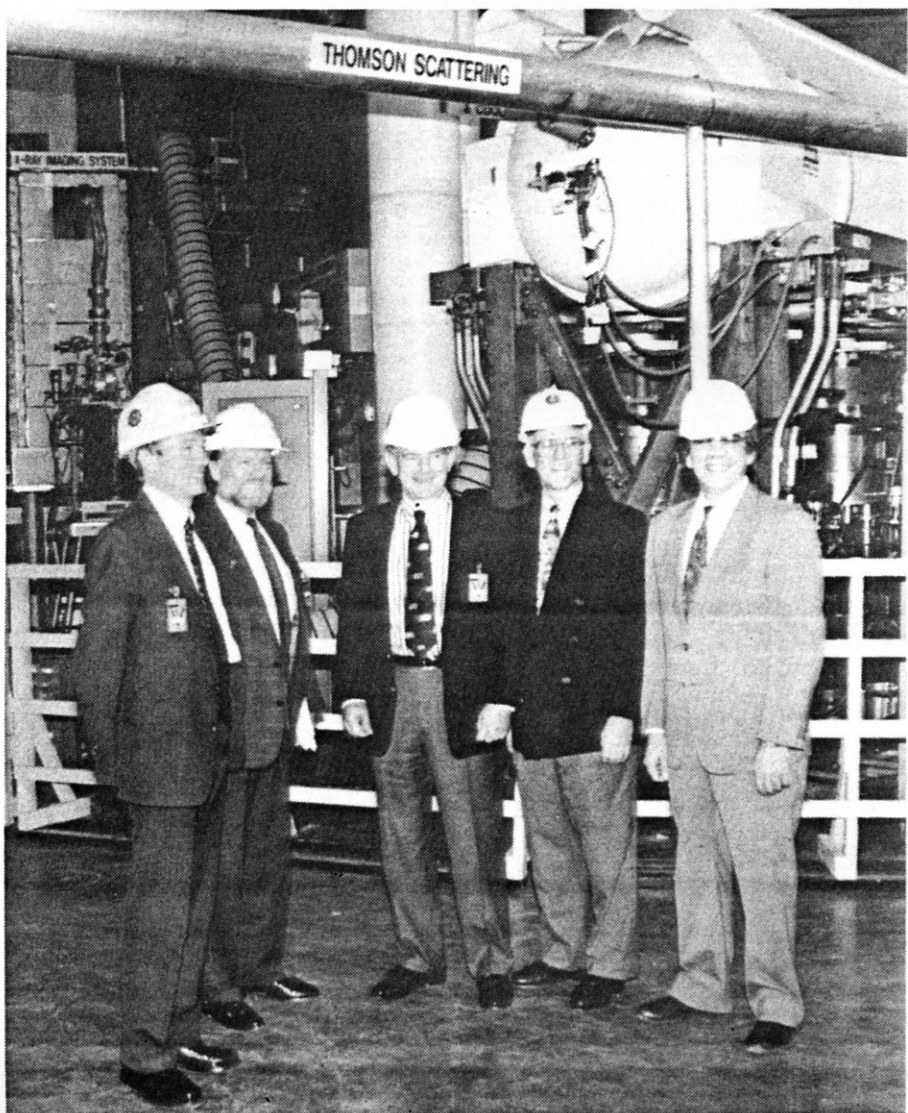
# What's Happening at PPPL?—What's Happening at PPPL?

Photo: D. Applewhite



Reggie Bynum (left) asks "What's a physicist?" and Cathie Schobel answers with a "Who knows?" shrug. The two were among 150 sixth graders and their teachers who toured PPPL from West Windsor-Plainsboro Middle School on November 10. The visit, arranged by Eric Perry, whose son attends the school, was videotaped by Marc Levenson to be part of a documentary titled "Discover New Jersey," which will promote the State, as well as science education, for the New Jersey Chamber of Commerce.

Photo: D. Krause



Senator J. Bennett Johnston (Louisiana), Chairman of both the Committee on Energy and Natural Resources and the Appropriations Subcommittee on Energy and Water Development, visited PPPL recently to learn more about fusion and its role as a future alternative energy source. Senator Johnston, center, is shown standing in front of TFTR. To the left of Senator Johnston are Proctor Jones, a key staff member on the Subcommittee for Energy and Water Development, and William Happer, Director of the Office of Energy Research. Milton Johnson, Manager, Princeton Area Office, and PPPL Director Ronald Davidson are to the right of the Senator.

## HOTLINE

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*Have a good holiday. Best wishes for 1993!*

*Ron Davidson*