

Hotline

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

Davies Tours Lab, Meets Staff

When Anne Davies concluded her April 6 visit to PPPL, she took with her a summary of PPPL's accomplishments and some "neat loot."

Davies, the Associate Director for Fusion Energy at the U.S. Department of Energy's (DOE's) Office of Energy Research, also left something behind — a trail of praises for PPPL and its successes.

"I just can't say enough good, enough positive about the Lab," said Davies, commenting on the successes of the Tokamak Fusion Test Reactor (TFTR). "From a scientific endeavor, it's been a superb accomplishment."

Davies' visit began with a morning session during which Tokamak Physics Experiment (TPX) Project Director John Schmidt and TPX Chief Scientist Robert Goldston discussed the status of and plans for TPX, and Richard Hawryluk, Head of the Tokamak Fusion Test Reactor (TFTR) Project, spoke about the accomplishments of and plans for the TFTR and the Princeton Beta Experiment-Modification (PBX-M).

Hawryluk also presented Davies with a framed color graphic showing TFTR's latest record breaking results — 10.7 megawatts of fusion power. Surrounding the results were the signatures of hundreds of employees. "The people you will meet today ... worked very hard to make this all happen," Hawryluk told Davies.

During her day-long visit at the Lab, Davies also had lunch with representatives of PPPL's Director's Advisory Committee on Women (DACW), the Director's Minority Advisory Committee (DMAC), and the Quality Improvement and Renewal

Education Program offices and ending with the TFTR Control Room. At the first stop, Davies picked up some "good loot," which was what she called the Science Education T-shirt presented to her by Sharon Sherman, Science Education Senior Program Leader.

While touring the Lab, Davies met staff of ongoing projects, including PBX-M, CDX-U, and TFTR, and became acquainted with technology such as the Laboratory's plasma processing apparatus. On the tour, Davies was accompanied by PPPL Director Ronald Davidson, Lab Deputy Director Dale Meade, Head of Computer Systems Dori Barnes, Technical Systems Head Al von Halle, and Hawryluk.

"Anne Davies' visit to the Laboratory was a great opportunity for her to meet many of the staff

and to hear firsthand about the many significant accomplishments," said Davidson. ●



Principal Physicist Sam Cohen shows Anne Davies the Princeton Divertor Simulator. (See page 2 for more photos of the Davies' visit.)

Committee, and with the Heads of Technology Transfer and Information Services. Each reported on their group's activities, describing highlights of the past year. Davies was particularly enthusiastic about DACW's "Take Our Daughters to Work Day" activities at the Lab.

Following lunch, Davies was whisked to Main Campus to meet with Princeton University Provost Stephen Goldfeld. She then returned to PPPL for a tour that included more than a dozen stops, beginning with the Sci-

INSIDE ...

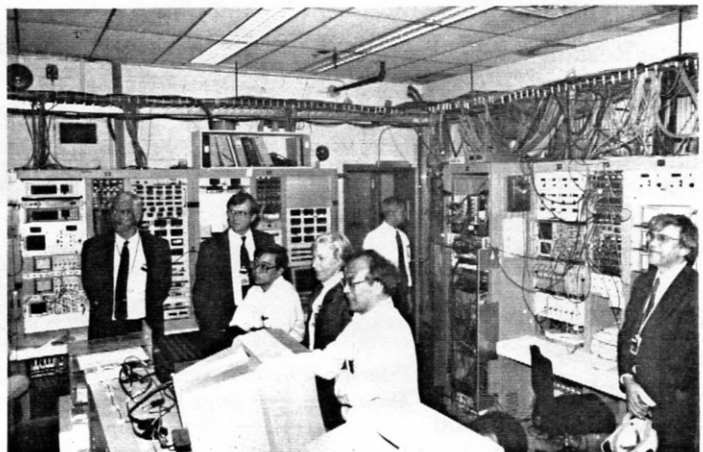
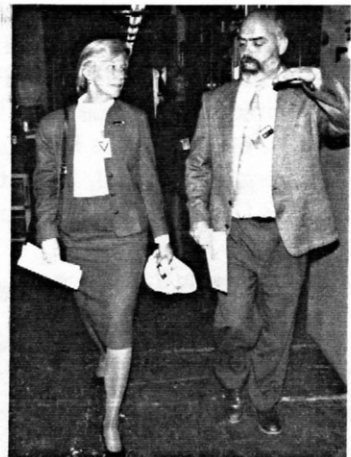
*They've Come a Long Way ...
Women in Nontraditional
Jobs at PPPL*

Davies Meets Staff During Visit



Photos by Dietmar Krause and Denise Applewhite

Anne Davies began her visit to the Lab with a morning session during which TFTR Head Richard Hawryluk presented her with a color graphic of TFTR's results (top). Later in the day, she toured the Lab. Clockwise, beginning with photo at right, are (from left to right): Davies and TFTR Heating Systems Division Head Al von Halle; Deputy Director Dale Meade, Hawryluk, Robert Kaita, Davies, Michio Okabayashi (at computer), Henry Kugel, and PPPL Director Ronald Davidson in the PBX-M Control Room; Paul LaMarche, Davies, Hawryluk, Sylvester Vinson (in cap), and Steve Raftopoulos; and Davies and Sharon Sherman, who is presenting Davies with a Science Education T-shirt.



HOTLINE

Editor: Carol Phillips
Writer: Patti Wieser
Layout: Patti Wieser

Photography: Dietmar Krause and Denise Applewhite
Reproduction: Teri Daynorowicz

The **HOTLINE** is issued by the Princeton University 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, LOB Bldg., C-Site; fax 609-243-2751 or telephone 609-243-2754, e-mail caphilli@pppl.gov

They've Come a Long Way ...

As the Laboratory prepares to host its second "Take Our Daughters to Work Day" on Thursday, April 27, five female employees at PPPL reflected on their experiences working in fields traditionally dominated by men. These women have often been the lone woman in a college or training course and have always been outnumbered by a sea of male co-workers. Some have had to master a juggling act in an effort to balance their home lives with their careers. As the day approaches that will bring dozens of young girls to the Lab to find out about career options, these women offered glimpses of what to expect in their occupations.

As a youngster of the Sputnik generation, Cynthia Phillips became attracted to the sciences — astrophysics, in particular — early on.

"At school, they'd roll in the TVs so we could all watch the rockets take off and we would all wish we were astronauts," said Phillips, a physicist at PPPL for the past dozen years. "I was always interested in astronomy and looking at the stars."

After an eventual shift in focus from astrophysics to plasma physics and the completion of a bachelor's degree and a Ph.D. in physics, Phillips landed a position on PPPL's research staff, where she currently studies radio wave propagation in plasmas.

"Radio waves are what you pick up on your radio when you listen to broadcasts. We heat plasmas with radio waves. We launch the radio waves into a plasma with an antenna the same way a radio station would launch them out into the atmosphere for a radio to pick up," explained Phillips. "We pick waves with characteristics for interacting with the ions or electrons in the plasma that cause the ions or electrons to move faster and thereby raise the temperature."

The physicist is one of two female physicists on PPPL's research staff. But being outnumbered by males — first in her high school, college, and graduate school physics classes and later in her career — has become a fact of life for Phillips. When she attended the Massachu-

setts Institute of Technology to earn a bachelor's degree in physics, she was part of an entering class comprised of only 10 percent women. "In my physics classes, there were just about six women out of 50 students. In some of my classes, I would be the only female," she said, adding that she was



Cynthia Phillips (right) and Randy Wilson

similarly outnumbered by male students while working on her Ph.D. in physics with specialization in theoretical plasma physics at the University of Wisconsin.

The ratio of males to females in physics has presented few problems to the physicist, however. "I guess if you're going to survive this far, you tend to not be bothered by such a situation or not to even notice it much. Since I've been in a predominantly male situation for so long, a lot of my friends have been male ... Sometimes, though, I can run into communications problems because what I say may mean something different to a man and vice versa," she said.

Offering some observations about working in a field dominated by men, she added, "You can study a physics problem and it doesn't have any gender associated with it. But *how* physics is done certainly does because men have such a different approach to life than women have."

While the field of physics continues to be populated by men — only about five percent of the practicing physicists are women — Phillips has noticed an increase of female students taking introductory physics courses. This is evidenced by the gender makeup of the freshman physics classes she teaches at Princeton University, where 40 percent of her students are females. "I think it will be easier for these women going through," the physicist commented.

Giving advice to young girls considering careers in physics, she said, "Take enough math courses to go along with science courses so that you develop the skills needed to be able to do physics problems. Most of all, keep your options open and make sure you're interested in what you're doing."

Phillips noted that science also provides a good educational foundation for those who plan to go into other fields. "I personally find it interesting to find out how things work. But the thought processes you develop or the way you attack problems is very analytical and rigorous, and carries over very well into other disciplines," she said.

Continued on page 4

Women

Continued from page 3

Susan Thiel remembers stepping down from the driver's side of a shiny red fire engine in her hometown and hearing children exclaim, "That's a girl!"

As an Emergency Service Operator (ESO) at PPPL for the past year and a volunteer firefighter in her hometown of Highland Park, Thiel is used to being greeted by a bit of surprise. She is one of two women out of a total of about 15 ESOs at the Lab. And she was the first female to become a volunteer firefighter in Highland Park, where, she said, "I kind of broke the ice."

But being a woman in a predominantly male field has presented few obstacles to the ESO.

"It doesn't bother me. I come from a fire company where I was the first lady to join," said Thiel, adding of her fellow firefighters and male associates at the Lab, "They're all like my brothers."

"You get a real feeling of accomplishment when you get to a fire scene and are able to secure it and improve the situation."

—Susan Thiel

She recalls being the only woman in some of her training courses. Once, during an exercise where she was suited up in firefighting garb, one man continued to deny that she was a firefighter. "You get that once in awhile, especially from the older, traditional men," she commented.

Thiel, who has a bachelor's degree in sociology from Rutgers University, is certified as an Emergency Services Technician, and has under-



Susan Thiel

gone training at the Middlesex County Fire School, said she became interested in her occupation when she joined the First Aid Squad in Highland Park. "When the squad was on the scene at fires, I wanted to help and often did little things like pick up fire hoses," she said.

At PPPL, her duties include responding to fires, medical emergencies and security calls, working at the Communication Desk — where she monitors cameras, radios, phones, and alarms — and at the guard booth, and participating in training drills.

Her favorite part of the job, she said, is "dealing with people" and gaining a sense of accomplishment. "You get a real feeling of accomplishment when you get to a fire scene and are able to secure it and improve the situation," said the ESO, adding that she has been encouraged in her work by her husband, who is Chief of the Volunteer Fire Department in Highland Park.

Thiel passes on her own encouragement to girls considering a career in her field. "Many girls grow up with Barbies and are still socialized to believe that they can only be nurses ... but their options are open nowadays," she said.

When Maria Pueyo attends a meeting at the Lab, her quest is specific: to find out what kind of hazardous waste is expected to be generated during the week.

Pueyo recently joined PPPL as a hazardous materials engineer in the Environmental Restoration and Waste Management Division. As such, she often sits in on tritium and TFTR group meetings to find out what test activities are planned and what types of hazardous waste they will produce.

"My job is to make sure that all the hazardous waste in the facility is correctly packaged, stored, and disposed of," said Pueyo, adding that a subcontractor packages and labels the waste before transporting it to a final disposal site. "We also take care of radioactive waste, which we package and test ourselves before a subcontractor picks it up and takes it to a disposal site."

Pueyo, who has a bachelor's degree in biology from the University of Cincinnati and a master's in environmental science from the University of Cincinnati's College of Engineering, has been enamored with science since she was in the sixth grade.

"I always knew I wanted to be involved in science. I had a teacher in

Continued on page 5



Maria Pueyo

Women

Continued from page 4

the sixth grade who really inspired me to go into science. And since I always liked biology, I figured that would be an easy way for me to start college. From there I became interested in environmental science," said the hazardous waste engineer. She noted that while she was working on her master's, she learned how to do gas chromatography, which is an analytical method for hazardous components in soil, water, and air.

Despite being outnumbered by males in her field — she is the only female hazardous materials engineer at the Lab — Pueyo retains her enthusiasm for her work. "I'm very happy with the work that I do. It's a little difficult sometimes when you see yourself outnumbered by men. Sometimes it's hard to find yourself within an area where everybody else is different. But the job is fun, very rewarding, and extremely interesting."

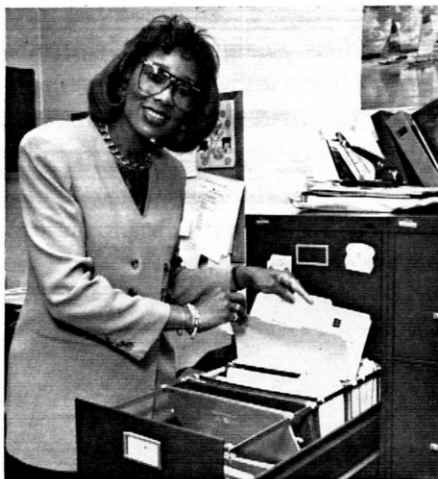
Fulfilling Work

She added that her work is "fulfilling" because she is doing something for the environment. In addition, she described the group she works with at the Lab as "absolutely excellent." "Everyone is professional and shares high expectations of themselves, which brings the whole group up," said Pueyo.

While Pueyo cited few problems in being in a male-dominated field, she noted the difficulty in balancing her career with family life. "I find that very hard to do. I don't have any children and I'm not considering it. Both my husband and I have full-time, professional jobs that demand a lot of time. I know that other women have both careers and children, but I don't think I have the energy for both," she said.

Echoing others interviewed, Pueyo said youngsters considering career options, especially in the sci-

ences, should study hard and choose an occupation that they're interested in. "Try to look for something to do that you're really going to enjoy, because you're going to spend a lot of time doing it. And don't try to make a decision too early on what you want to do because you may change your mind," she advised.



Arlene White

Arlene White enjoys visiting the TFTR Test Site, scanning objects that have a "dash 10" on them.

"Whenever I see 'dash 10' on any parts over there, I get really excited because that's my buyer number," explained White.

As a senior buyer for Procurements, White has handled several contracts on TFTR parts.

Starting off 19 years ago at the Lab as a secretary to the manager of purchasing and taking business education courses at Rider College, White realized she enjoyed *working* in the field more than teaching it. And with the encouragement of her boss, John King, she pushed on and continued to take classes and advance in her career. "As time went on, my responsibilities grew from being clerical support to administrative," said White.

As a senior buyer, she writes contracts for amounts that are as little as \$54 and as much as half of a million dollars and range from a fax machine

tray and lawn maintenance services to cylinder gases and TFTR parts. In addition to contract writing, White's duties include evaluating Requests for Quotations, making inquiries, meeting with vendors, and attending trade shows.

Direct Link to DOE

White was also recently named Small Business Liaison for the Procurement Division. "As Liaison, I am a direct link to the Department of Energy (DOE). There are certain goals we have to achieve that relate to doing business with small, woman-owned, and disadvantaged businesses. We don't want to always place the dollars in the hands of large businesses. So I actually cultivate and develop contacts with small businesses," said the senior buyer, who has an associate degree from Mercer County Community College and has completed three years of business education at the college level.

Having a "full plate" and balancing family and outside interests with career seem to energize rather than overwhelm White. When White started at PPPL, she also took college classes and modeled in New York on the weekends. Over the years, White has also managed to complete paralegal certification and to raise a daughter, who recently graduated from Smith College.

Certain Traits

White cautioned that women employed in the buying field require certain traits, especially strength. "You can't take anything personally. And you have to have a certain amount of skill and creativity to get those contracts in place and to get the best price for the DOE and for Princeton University," said White.

In addition, there are things that women must be more careful about. "Men can go out for lunch with sales-

Continued on page 6

Women

Continued from page 5

men and not worry. But I can't because I don't want people wondering whether I'm having lunch for business or for pleasure," said White.

The senior buyer attributes her lean toward business and her verve to her father, who has always owned businesses. "He would often say, 'A man who works can have anything he wants,' but he was talking to his daughters," said White. She called her father a forceful type, who taught his daughters to be the same. Many of White's relatives have their own businesses and her family has incorporated as a nonprofit organization called Bo-Rietta, which services soup kitchens and makes charitable donations.

Although business has traditionally been dominated by men, there are an equal number of female and male buyers at PPPL — two of each. In addition, there are two female sub-contract administrators out of six.

In her office that is filled with filing cabinets full of contracts White has written and stacks of requisitions and paperwork, the phone rings incessantly.

But that's how White prefers it. "I like being pushed. I like being under the gun. I like talking to people. And I like resolving conflict," she said.

Jane Montague revels in being confronted by problems. The lure, she said, is the prospect of fixing them.

As an electrical engineer in the hardware branch of PPPL's Computer Systems Division, she said she enjoys taking things from "broke to unbroke." Montague designs and maintains control and data acquisition systems for the Tokamak Fusion Test Reactor (TFTR), including such projects as designing the clock system that runs TFTR.

Montague's career choice seems only logical, considering she hails from a family of engineers headed by a father who "thought everyone should be an engineer," said Montague, who first earned a bachelor's in English from Stanford University before switching to engineering because of brighter employment prospects.

"My father assumed normal people became engineers. Since it seemed like a logical choice for him, it didn't seem like an illogical choice for me. And also, he never differentiated between sons and daughters in that sense," she explained.



Jane Montague

The electrical engineer, who has been at the Lab for 15 years, said she rarely notices being outnumbered by men in her field, although she remembers being one of the three women out of 1,000 students in her electrical engineering graduating class at the University of Washington. "There weren't very many women. I knew all of them," she said with a chuckle.

At PPPL, she is the only female electrical engineer in her section, except for a female co-op student. "I've recently become more aware of

being outnumbered by men ... Sometimes I attend big meetings at the Gottlieb Auditorium and there are 200 men and about six women," she said.

The gender ratio has presented few obstacles, although Montague concedes that she may not have recognized some problems along the way. For instance, she used to think that when a man treated her differently than he treated male colleagues, it was because he did not like her. Later, she found out the difference in treatment was based on sexism. "I don't pay much attention to it, which isn't truly an advantage because it is probably better to know what's going on and to pay attention to those kinds of prejudices," said Montague.

The engineer said her largest obstacle is balancing her career with her outside activities, which center around "Chester," her Hanovarian show-horse.

"My mother claims my first word was 'horse,'" said Montague.

Noting that she heads to the barn four to five times a week — including at least two nights after work and both weekend days — Montague said, "My biggest problem is that I don't have enough time."

Enthusiasm for Science

Despite the difficulties of balancing career and outside interests, engineering is a field Montague would encourage to those who share her "enthusiasm for science."

"The problem solving aspects are interesting to me. It's even kind of fun when things break because you get to look at the system, see what's broken, and figure out what needs to be done to fix it," said the engineer, who checks one piece at a time and works through every possible option. "It's tedious in some ways, but interesting in that you're all whacking away at trying to get from broke to unbroke." ●

