HOTLINE

PRINCETON PLASMA PHYSICS LABORATORY

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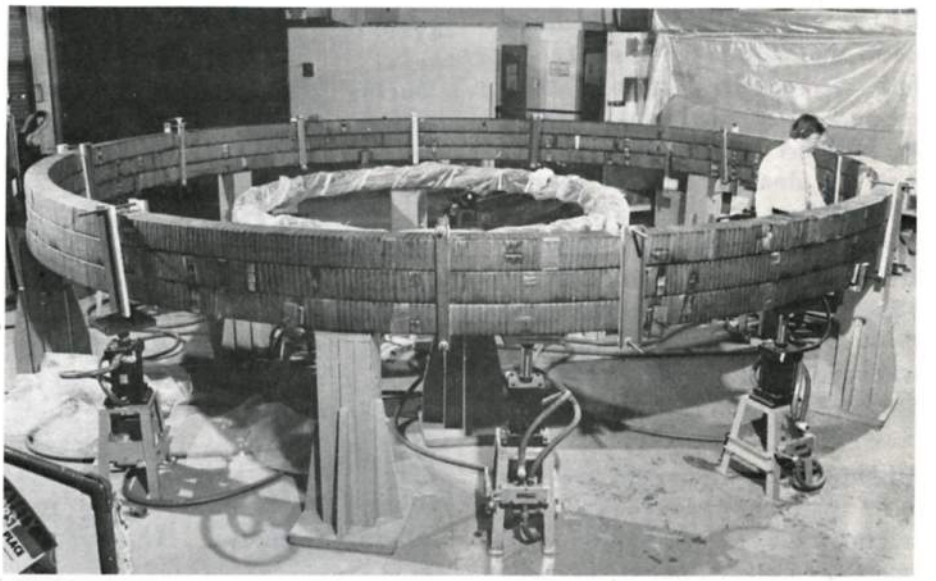
PPL CONTINUES WINDING ATF COILS

The PPL Coil Shop is busily fabricating coil windings for a major fusion device, but those coils won't be installed on any Princeton machine. Rather, the shop is completing vertical field windings which will be incorporated into the Advanced Toroidal Facility (ATF) at Oak Ridge National Laboratory.

The ATF is an advanced alternate concept. (For a description of the device itself, see the box on page 3.) Assembly of the ATF should begin in the latter part of this year, with final assembly and initial operation now scheduled for late 1986.

Due to the availability of tooling and facilities acquired during the TFTR large poloidal field coil manufacturing program, as well as the lab's experience in designing and building large coils, Princeton was invited to participate in the design and fabrication of the ATF vertical field (VF) coils. Many of the programs Oak Ridge sought in conjunction with the actual coil winding, such as quality control, had been established here during previous work on the TFTR large coil systems. Coil Shop engineers were instructed to approach the project as if it were their own, and to design the coils accordingly. Oak Ridge provided overall design parameters, and PPL added the engineering, cost estimates, and schedule to accommodate those conditions. The task included the design of the three coil pairs and their supports, fabrication of the coils, and fabrication of some additional supports. The total estimated cost for the project is $2.1 million.



Jim Chrzanowski, cognizant engineer for the ATF program, examines the outer vertical field coil bundle wound in the 1-K Coil Shop. The bundle consists of a trim coil "sandwiched" between upper and lower main coils.

The inner ATF VF coil weighs 1750 pounds and operates at 8.2 kA during steady-state operation, or at 16.4 kA in a five-second pulse. The mid VF coil, which weighs 4670 pounds, is only used during steady-state operation at a current of 12.75 kA. Each outer VF coil consists of two groups of two three-turn "pancake coils" connected in parallel, and one 15-turn "trim" coil. The "main" coils operate at 62.5 kA steady state, or 125 kA in a five-second pulse. The trim coils nominally operate at 15.6 kA.

The VF coil support system must counteract the attraction and repulsion forces the coils exert during normal machine operation. In addition to structural support, the system must allow the coils to be

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aligned to within 1 cm. Shim packets are incorporated throughout the design, with insulation providing two electrical breaks in the supports.

The ATF's outer main VF coil required an exceptionally large copper conductor, which made the winding process somewhat more difficult than coils previously wound at PPL. The ATF VF coils have been designed to operate at half current in a steady-state mode, or at currents as high as 125 kA in a pulsed mode. A great deal of heat is generated during steady-state operation, requiring high coolant flow rates. Approximately 1500 gallons of water per minute will flow through the water-cooled copper VF coils during this operational mode.

Once the final design for the ATF was approved, PPL was authorized to proceed with the VF coil fabrication program. The program is scheduled for completion in late September.

Since the main tooling was compatible, much of the equipment used for TFTR coil winding was used for the ATF project. For example, the TFTR winding mandrel was modified to permit ATF winding. This tooling compatibility, coupled with the availability of the large oven used for TFTR coils to provide heating, pressure bonding, and final curing for the ATF coils, resulted in a significant savings to the project.

The machine's VF coils are being fabricated from silver bearing extruded copper bars. The extrusions have a centrally located hole for cooling. Coolant hole sizes are tested for uniformity by rolling a ball bearing of specific diameter down the cooling passage for the entire length of each copper bar. The bars are then degreased inside and out and wrapped with Mylar and B-stage polyester-glass tape, which provides turn-to-turn insulation and bonds the turns together.

During the winding process, either a base plate or coil frame (depending on the coil being wound) is attached to the winding table. The end of a copper bar is clamped to the winding mandrel, and is wound under tension. The bars are connected by brazed joints; each joint is tension tested to 14,000 pounds per square inch (psi) and helium leak tested. Coil leads are induction brazed into place during the winding process. The wound coils are ground wrapped with additional insulation and are placed into a press-mold. The coil and mold are then heated and cured in PPL's large coil oven.

Once removed from the mold, each coil is cleaned again and receives a coating of ground plane varnish. Final acceptance testing is conducted, and the finished coils are crated for shipment to Oak Ridge.

The ATF project has had a minor impact on the Coil Shop schedule, absorbing only 20% of the shop's capabilities. The Coil Shop is accomplishing all its other tasks for PPL in parallel with ATF coil winding.

The inner VF coils will be shipped to Oak Ridge in June, followed by the outer coils in July. The mid coils will be shipped in late September.

Glenn Northey, lead ATF technician, monitors the winding of one of the main VF coils.

Advanced Toroidal Facility (ATF-1)

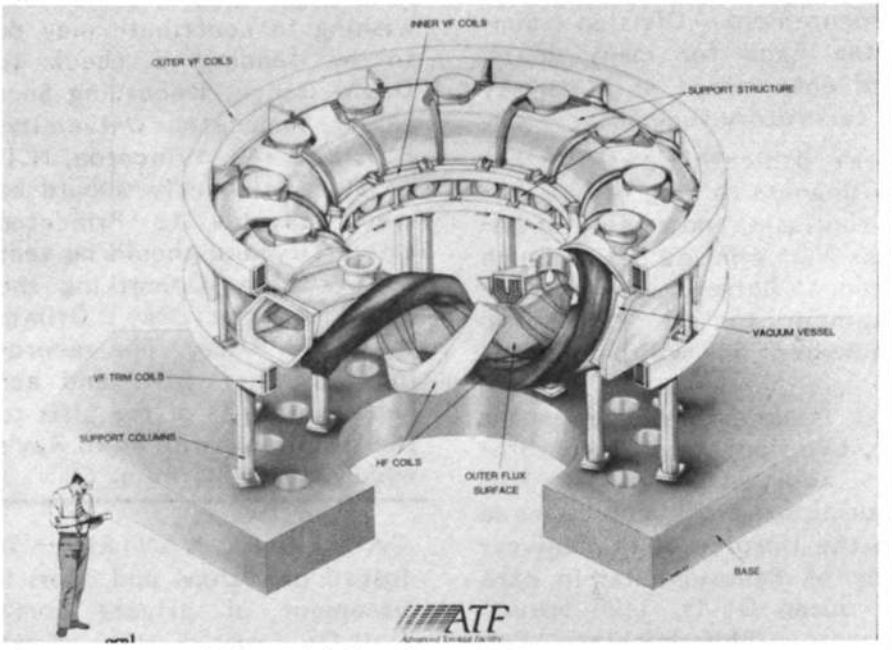
Oak Ridge National Laboratory proposed the Advanced Toroidal Facility (ATF-1) to the Department of Energy in late 1982. The new device is to serve as a replacement for the laboratory's Impurity Study Experiment (ISX-B) tokamak.

The ATF is based on the torsatron confinement scheme, a variation on the stellarator concept, which was originated at Princeton University in the early 1950's by Lyman Spitzer. In a torsatron, both the toroidal and poloidal fields are generated solely by helical coils. The ATF, a moderate aspect ratio torsatron, is designed to explore improvements in toroidal confinement. Emphasis will be placed on investigating the principles of high beta, steady-state operation, as well as reactor concept improvement. The device will have the flexibility to vary its configuration, providing fundamental information on the effects various configurations have on plasma performance.

The ATF coil system is being fabricated of water-cooled copper. The system consists of two helical windings of 14 turns each, and an inner, middle, and outer set of paired vertical field (VF) coils. The helical coils will be fabricated in upper and lower segments together with their support structure; the VF coils will be pancake-wound.

The ATF vacuum vessel will consist of 12 identical sections welded from 0.25-inch stainless steel plate. Two large ports will be provided at the top and bottom of the vessel, with another large port on the side. The ATF cost goal for major device fabrication is $20 million.

ATF is a torus with a 2.1 m major radius. It will operate at a magnetic field of 20 kilogauss for a five-second pulse, or 10 kilogauss steady-state.



The Advanced Toroidal Facility (ATF)

Effective immediately, all personal checks cashed in the Petty Cash and Emergency Travel Advance office must be made out to PPPL. Checks made out to M. Doran will no longer be honored.

The hours for the Petty Cash and Emergency Travel Advance office are from 9 to 10 a.m., and from 2 to 3 p.m. daily. The office is located in Room 107 of the 1-E Building.

This change also affects checks cashed at the Module II reception area from 8:30 to 10 a.m. and from 3 to 4:30 p.m. daily.

TRANSITIONS

The HOTLINE offers its congratulations to the following employees, who recently became proud parents:

Tom Steer of the Engineering Services Group, and his wife, Laura, of the Personnel Division, whose twin sons, Luke and Matthew, were born May 17;

Joe DiBartolo of Photo Lab and his wife, Judy, whose twin daughters, Jenna and Lauren, were born May 20;

Paul LaMarche of the Research Division and his wife, Deirdre, whose daughter, Casey, was born May 24.

The HOTLINE would also like to congratulate Howard Holzbaur, John Kane, and Marcos Paula, who all retired from laboratory service on June 1.

Obituary

Dolores (Dee) J. Rudy Hurley, 53, died May 6 following a lengthy illness.

Born in Detroit, Dee was a resident of Bensalem, Pa. She had been a laboratory secretary in the Procurement Division since 1978. During that time, she organized the entertainment portion of several Secretarial and Office Support Staff (SOSS) annual Secretaries' Week programs. She produced the comedy skit, "The Winds of PPL," for the 1983 program. She also composed and performed a variety of PPL-oriented songs, including "TFTR" (sung to the tune of "New York, New York"), which she reprised in inimitable fashion at last year's SOSS party. She also served as publicity secretary for the group during 1983.

Dee organized and ran the Procurement Division Sunshine Fund for many years, and entertained at a variety of laboratory functions.

Dee's dedication to PPL, her willingness to help others, her enthusiasm, and a sense of humor that allowed her to laugh even at herself, served as an example to all those who knew her. She will be missed.

Dee is survived by her mother, two daughters, two brothers, and two grandsons. Memorial donations may be made to the Hospice of the University of Pennsylvania, in care of Susan Davis, 3400 Spruce Street, Philadelphia, PA, 19104.

Ray Grimm Prize

In an effort to honor Ray Grimm, whose premature death last summer saddened many of his friends and colleagues, the Raymond C. Grimm Memorial Prize has been established. A Princeton University graduate student will be selected annually to receive the Prize, which awards significant achievement in computational physics.

A substantial contribution to the Prize has been made by Cray Research, Inc. In making the gift, the corporation recognized "the important contributions of Raymond C. Grimm in the area of computational plasma physics, and his support of the National Magnetic Fusion Energy Computer Center. We are pleased to participate in this tribute to a distinguished scientist and teacher."

Donations to this fund in Ray's memory are now being solicited. Any PPL friends wishing to contribute may do so by sending a check to David Dodge, Recording Secretary, Princeton University, P.O. Box 140, Princeton, N.J. 08540. All checks should be made payable to Princeton University and should be sent with a note earmarking the gift for the Ray Grimm Memorial Prize. The recording secretary will send acknowledgments of the gifts to the donors, as well as to Ray's widow, Elaine Grimm.

CARPENTER WANTED -- To install partitions and doors in basement of private home. Call Dr. Ernst de Haas at ext. 2290 if interested.

Right to Know Q & A

As of June 30, PPL must comply with the New Jersey Worker and Community Right to Know Act. The Act stipulates that all hazardous substances used in the workplace be properly labeled, and that employees working with these chemicals be trained in safe handling techniques.

Specific provisions of the Act are explained in question and answer form below. If you still have questions after reading these answers, call Ken Semel at ext. 2531 for more information.

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Q: Why do we have to spend time labeling all these chemicals?

A: The laboratory has no choice; the Right to Know Act was signed in 1983, and became law in August of last year. Therefore, the labeling program is now mandated by state law.

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Q: Is this something new for PPL?

A: Not really. The laboratory has been conducting a chemical training program since October 1983. In fact, the Occupational Medicine and Safety Division (OM&S) has already compiled a list of items commonly used at PPL which contain chemical substances appearing on the N.J. Workplace Hazardous Substance List (WHSL).

Q: Does OM&S determine whether a substance is hazardous or not?

A: No; that determination has been made by the New Jersey Department of Health, which published the WHSL. However, a substance or compound not appearing on the list doesn't mean that no hazard exists. For more information, contact OM&S, ext. 2531.

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Q: Who's responsible for making sure everything is properly labeled?

A: Division heads are responsible for making sure the program is followed. Line supervisors must be sure all substances on the WHSL being used in their area of responsibility are properly labeled. Line supervisors must also ensure that their employees receive proper training in the use of these substances, and that Material Safety Data Sheets (MSDS) are available for their personnel.

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Q: Why does Materiel Control need the labeling information?

A: Because Materiel Control is responsible for making sure all incoming shipments of chemical substances, as well as all such materials signed out from the stockrooms, are properly labeled.

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Q: Then what will OM&S be doing?

A: Keeping PPL's MSDS and hazardous substance list updated; reviewing incoming requisitions and identifying contents and Chemical Abstract Service Numbers (CASN) to the user and to Materiel Control for labeling; conducting training sessions for employees; and auditing the laboratory's compliance with the Act.

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Q: What information has to be on the label?

A: The chemical ingredients of the substance, and the CASN for each ingredient. In the case of mixtures, the chemical ingredients and CASN for the five most predominant substances must be listed.

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Q: What if I find a container full of some unknown chemical?

A: It must be labeled "Contents Unknown" or "Contents Partially Unknown," as appropriate, by June 30. If the contents of the container are identified at a later date, however, the label should be changed in accordance with the Act.

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Q: What kind of labels do I need?

A: That's up to you. The way the chemical containers are labeled is up to the individual. Self-adhesive labels, available through the stockrooms, are one suggested way of attaching the information to the containers.

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Q: Is there a deadline for this labeling to be completed?

A: Yes. By June 30, all containers holding any hazardous substance from the WHSL must be labeled. And by August 29, 1986, every container holding any chemical must be labeled, regardless of whether the chemical inside it is on the WHSL or not. These deadlines can't be delayed, since they were mandated by the Act.

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Q: What kind of employee training are you talking about?

A: Employees must be trained about the health risks of hazardous chemicals, as well as the safe procedures for handling hazardous substances. Training courses will be coordinated by the Industrial Hygiene Section of the OM&S Division.

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Q: Where can I get copies of the MSDS for my employees?

A: MSDS are available at the stockrooms or from OM&S for stockroom items. All other MSDS are available from OM&S.

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Q: How are these procedures being distributed?

A: Health and Safety Directive (HSD) 5014.1 explains the program, and will be distributed shortly. This new HSD replaces an old HSD, which has been deleted. If you are not an HSD recipient, contact OM&S, ext. 2531, for a copy or for further information.

Spring Cleaning

Spring time is cleaning time. How much time you invest in making your house beautiful is up to you. However, safety should dictate how much you do to clean away clutter, remove unnecessary flammable materials, improve your storage areas, and fix potential hazards. You should also take steps to avoid injuring yourself while making your home safer.

Here's a checklist to help you through this task:

- Dress for the job. Wear protective equipment -- safety shoes, goggles, gloves, and so on -- when needed.
- If children are around, keep them supervised while you're busy.
- Don't leave buckets of liquid unattended, not even "just for a minute."
- Some liquid cleaners and solvents produce harmful vapors. Read labels carefully and use these only in well-ventilated areas.
- Use all cleaners as directed on the label only. Never mix cleaners.
- Oily rags should be placed in a tight-fitting tin can. Store the can in a cool place where the rags won't ignite.
- Be careful with what you put in a clothes dryer. Some rubber articles can burn. Check the label to be sure.
- Use self-polishing or non-skid waxes on floors to prevent falls.
- Don't carry so much that you can't see where you're going.
- Stairs should never be used for temporary storage.
- Make sure you know how to lift heavy objects. Bend your knees!
- Never use boxes, chairs or other makeshift ladders. Be sure ladders are placed firmly.
- Test your smoke detectors to make sure the batteries are still good.
- Apply decals to large glass panes that could be mistaken for open doors.

The PPL HOTLINE is issued by the Princeton University Plasma Physics Laboratory, a research facility supported by the United States Department of Energy. Correspondence should be directed to PPL Information Services, Module 2, C-Site, James Forrestal Campus, ext. 2754.

Security Checkpoints

In order to maintain the safe environment of the Forrestal Campus for employees and guests, specific rules and motor vehicle regulations have been established. Speed limit signs have been posted, stop signs have been placed in areas where the protection of pedestrians and motorists is required, and handicapped parking space signs have been allocated according to the New Jersey motor vehicle statutes.

In complying with New Jersey motor vehicle law, the Security Department has endeavored to protect the well-being of the laboratory staff. One of the Security Department's growing concerns for individuals driving through the facility is the moving violation of tailgating.

Tailgating is a serious safety hazard to all motorists. Accidents occur within seconds; keeping a safe distance from other moving vehicles could prevent serious injury to yourself, as well as to the other drivers sharing the road with you.

According to Section 39:4-89 of the state motor vehicle law ("Distance between Vehicles"), "The driver of a vehicle shall not follow another vehicle more closely than is reasonable and prudent, having due regard to the speed of the preceding vehicle and the traffic upon, and condition of, the highway."

Let's all show reasonable and prudent regard for our fellow employees by keeping a safe distance from each other while driving.

OSHA Violations

The following safety reminders are drawn from a list of common OSHA (Occupational Safety and Health Administration) violations:

- Protective eye and face equipment shall be required where there is a reasonable probability of injury that can be prevented by such equipment.
- Respirators shall be stored in a convenient, clean, and sanitary location.
- Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.

Photography Exhibit

An exhibit of photographs taken by New Jersey freelance photographer Clem Fiori are on display in the Dorothy Brown Room at the Princeton University League headquarters, 171 Broadmead, weekdays from 9 a.m. to 1 p.m.

The exhibit, which includes abstract close-ups of natural materials as well as photos of rural New Jersey landscapes, will run through June 7.

Dr. Fisch Wins Guggenheim Fellowship

PPL research physicist Nathaniel J. Fisch has been selected to receive a one-year Guggenheim Fellowship from the John Simon Guggenheim Memorial Foundation.

Approximately 3,500 applications for Guggenheim Fellowships were received this year. The 270 candidates who were awarded fellowships were chosen by a seven-member panel of experts in a variety of fields. Selections were based on an applicant's past work, as well as potential future achievement.

Each applicant was required to outline a proposed area of research to be investigated during the Fellowship term. In Dr. Fisch's case, he will be determining whether solutions derived in plasma physics might be applicable to other physics problems.

Dr. Fisch received his bachelor's, master's, and doctoral degrees from MIT, where he also did his postdoctoral work. He became a member of PPL's Theory Division in September 1978 and is currently investigating transport in driven systems.

FOR SALE -- Public address system, eight channel stereo board with two cabinets. Asking $500. Call Eric in Graphic Services, ext. 3370.

Library Joins Computer Age

A new computer terminal coupled with a "smart modem" has made the PPL library's computerized literature searches much easier to complete. But despite the increasing automation of their operation, maintaining the "user friendly" atmosphere remains a top priority for the library staff, which includes PPL head librarian Jane Holmquist, assistant librarian Rhoda Stasiak, special collection assistants Sharon Brown and Joan Eisenberg, and typist Michi Nakayama.

DOE/RECON and NASA/RECON are two of several database systems the library can access to answer reference questions or perform literature searches. These computerized searches are an increasingly popular library service. A total of 460 searches were performed in 1984, compared to 308 searches in 1983 -- a 50% increase. The capability is especially useful to the physicist or engineer writing a review article, the graduate student starting his thesis research, or to the individual who simply needs to complete a reference citation.

In addition to saving time, head librarian Jane Holmquist feels that the process of formulating the search request helps the user focus more precisely on the specific information required.

DOE's ENERGY DATA BASE, the file the librarians use most, is compiled by the Technical Information Center in Oak Ridge, TN. It includes energy-related journal articles, technical reports, patents, books and conference papers. These can be retrieved using subject terms, title words, report numbers, journal titles, and personal names, singly or in various combinations.

The DIALOG database system covers a much broader subject spectrum than does DOE/RECON. The DIALOG files searched most frequently include INSPEC (the online equivalent of Physics Abstracts, Electrical and Electronics Abstracts, and Computer and Control Abstracts); NTIS (the National Technical Information Service's database); SCISEARCH (the online equivalent of Science Citation Index, which is useful for discovering who has cited a particular journal article); and BIOGRAPHY MASTER INDEX.

The RLIN (Research Libraries Information Network) database is the online cataloguing tool of over 30 major research libraries throughout the country, including Stanford, Yale, and the New York Public Library. Princeton University has used RLIN to catalogue its collection of monographs and serials since 1980.

PPL's library has reciprocal borrowing agreements with the other research libraries using RLIN. It takes approximately one month to obtain a book by interlibrary loan.

That time can be shortened to two days if the book is located in a branch of the University library.

"Using RLIN is like looking through a card catalogue of all the member libraries' combined holdings," Jane explained. The process not only saves time, but provides a much more comprehensive and sophisticated search than could be accomplished previously.

The costs for searches on the DIALOG databases generally range from $15 to $25, and are charged back to the requestor's cost center. The library absorbs the costs for searches on DOE/RECON, NASA/RECON, and RLIN. For more information on the searching process, or to arrange to have a search done, call Jane at ext. 3567 or Rhoda at ext. 3566.

Computerization hasn't supplanted the library's traditional use of "hard copies," however. Last year, lab employees borrowed over 4500 books, journals and reports from the library's collection of approximately 10,000 bound volumes, 18,000 technical reports, and 29,000 microfiche holdings. An additional 1500 journals and books were obtained for their use on intralibrary loans from the Princeton University Library system.

The library's timely cataloguing and indexing of pertinent journal articles and reports complements the computerized databases nicely. Along with the library's Monthly Bulletin and Acquisitions List, the cataloguing service helps PPL researchers keep current with the latest plasma physics/-nuclear fusion literature. The time-consuming cataloguing of individual journal articles

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and laboratory reports constitutes a resource not routinely available from most libraries. The PPL system is so efficient it can often provide journal references six to eight months ahead of the DOE/RECON database.

The library's collection of books, journals and reports has developed over the years in support of the laboratory's research program. Jane emphasized that she welcomes suggestions for new acquisitions from library users in order to maintain a collection relevant to the laboratory's mission.

Stress Testing

Last summer a 46-year-old man felt excruciating pain across his chest while playing a weekend game of golf. In certain circumstances, the events that followed could have led to coronary bypass surgery. But this man was lucky -- he didn't have the surgery.

That weekend golfer was given a stress test in an effort to check the condition of his heart. The test revealed some changes in the man's heart while he exercised, but none specific enough to determine whether the man was suffering from coronary artery disease. That's not so rare; forty percent of all regular stress tests are inconclusive or inaccurate.

In the golfer's case, however, a second stress test was ordered -- this time with radioactive tracer thallium-201 injected into his bloodstream so his heart could be 'photographed.'

Thallium-201 was developed in the early 1970's at the Department of Energy's Brookhaven National Laboratory in New York. Prior to that time, there was no radioactive isotope available that was both readily producible and medically useful for imaging the heart.

Within five minutes after injection, thallium-201 disappears from the blood and is deposited in the muscles, which include heart tissue. A radiation reading camera tracks the isotope and measures its accumulation in tissue. During a scan, thallium-201 will not accumulate in sections of the heart that are receiving insufficient blood supply. Rather, it accumulates at the sites of blockages preventing blood from reaching the heart, allowing them to be pinpointed.

The thallium tests also tell if a patient with heart disease is a good candidate for coronary artery bypass surgery. If the scan shows that the heart muscle can accumulate thallium from its blood supply, bypass surgery may be helpful. In the golfer's case, thallium-201 ruled out heart disease as the source of his pain.

Thallium-201 is used 370,000 times a year for heart imaging. Because the demand for the isotope is so great, the technology for its manufacture has been transferred to industry. Thallium-201 now has a $30-million market, which is growing by about 10 percent per year.

The clinical work with thallium-201 is one more example of how the Department of Energy supports basic and applied research that benefits all Americans.

United Way

AT WORK

Planning a Safe, Fun-Filled Vacation --

If your vacation plans include travel, take along a few tips from the United Way-Princeton Area Communities:

- Be sure to make advance reservations for motels and hotels wherever you plan to stay -- including places where you'll stop along the way.
- If driving, have your car serviced before you travel. The money you might have to spend to make sure your car is running properly before you leave will pay dividends by avoiding the unnecessary delays and aggravation a breakdown on the road can cause.
- If flying or taking the train, don't get left behind. Arrive early at the airport or station, with tickets in hand. Don't wait to pick them up just before you depart; delays at the station may derail your vacation before it begins.
- Children require special care when traveling. Make sure you take frequent exercise breaks during your trip. Bring toys and a supply of childrens' medicines. And remember that a young child travels safest in a specially designed infant's or child's travel seat.
- It's best to leave pets with a friend or at a kennel. If you must travel with your

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pet, be sure to call ahead to find out if your hotel allows pets. While on the road, keep your pet on a leash or in a travel kennel. Never leave a pet inside a parked, enclosed car -- heat stroke is a killer. And be sure to interrupt your driving with planned stops to water and walk your pet.

- Traveling overseas? Get your passport in the off-season (spring, autumn, or winter). Do not wait until summer, when the large volume of requests may delay the processing of your application from six to eight weeks.
- International travelers should be aware that some countries, such as Spain and Austria, do not recognize United States driver's licenses. Other countries require special medical insurance for travelers. Your travel agent or local auto club can alert you to the special requirements of the country you're visiting, and provide information on obtaining international driver's licenses.
- Remember to bring emergency provisions (medications, copies of prescriptions, an extra pair of eyeglasses, extra traveler's checks, etc.). Pack them in your carry-on baggage when you fly so they're easily accessible.
- Be sure someone back home knows how to reach you in case of an emergency.

If you are stranded out of town, you can contact the information and referral service of the local United Way where you are for information and help.

Home Fire Hazards

As the saying goes, "There's no place like home." But that easy familiarity can breed a wealth of hazards if we allow our fire prevention guard to drop when we leave the office. You can keep your "castle" from turning to cinders by observing these simple home fire rules:

- Take the time to prepare a home escape plan, which should include at least two exits from any room in case of fire. Then establish a regular schedule for practicing Exit Drills In The Home, or EDITH.
- Be sure smoke detectors are installed on each level of your home, with one outside each sleeping area. You should be able to hear the detector signal even when the bedroom door is closed. Once the detectors are installed, don't forget to test them frequently; replace low or dead batteries immediately.
- Smokers are responsible for more fatal home fires than any other cause. If you smoke, use large, deep ashtrays, and dump ashes into a metal can when cleaning up.
- Approximately 70,000 fires in the United States are caused each year by children playing with matches. Keep matches from the reach of curious little ones.
- Make sure all flammable liquids (such as kerosene, or the gasoline for your lawn mower) are stored in safety containers far from sources of heat or flame.
- Never operate electrical switches with wet hands, and don't use electrical appliances while in the bathtub, while standing in water, or at any other wet location.
- The kitchen can be the most dangerous room in the house when it comes to burns. Toddlers should be in a playpen (rather than underfoot) while older family members are cooking. Turn pot handles inward so that inquisitive kids won't be tempted to grab them. Smother a pan fire with a lid· never use water or flour.

Grad School Roundup

Princeton University's Department of Astrophysical Sciences has attracted a "prize" group of students for the fall 1985 semester in the Plasma Physics section. Of the eight students who accepted admission offers, six have received a variety of fellowships.

Two incoming Plasma Physics Department students, John Cuthbertson and Mark Bannister, were among six students across the country who won the Oak Ridge Associated Universities' (ORAU) Magnetic Fusion Science Fellowships. Sponsored by the DOE, these three-year awards are available to college seniors and first-year graduate students. Each Fellowship provides full tuition, a $12,000 per year stipend, and

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a practicum at a major fusion laboratory during the summer following the first academic year. Incoming student David Ward of Arizona State received Honorable Mention from the ORAU in the fellowship competition.

ORAU also sponsors a similar set of Fusion Technology Fellowships. One of this year's winners is incoming student Donald Roberts from the University of California at Irvine.

Other entering students bringing fellowships to Princeton with them are Arif Babul, Alain Brizard, and John Bowman. Each has received a fellowship from Canada's National Science and Engineering Research Council.

Chang Hee Nam, a second-year student, is one of 20 students named as recipients of a Josephine de Karman Fellowship. First-year departmental graduate student Edward Powell is also a new award winner, receiving a three-year fellowship from the National Science Foundation.

Changes have also been occurring in curriculum. Beginning next spring, the Department of Physics will offer a new plasma physics undergraduate course. The course, which will be cross-listed with the Department of Mechanical and Aerospace Engineering, will be taught by lecturers Robert Goldston and Paul Rutherford.

On the graduate level, an expanded Program in Plasma Science and Fusion Technology will be offered this fall. The program, headed by Robert Mills, spans the five departments in Princeton's School of Engineering and Applied Science (SEAS). It offers PPL-funded opportunities for doctoral and master's degree research by SEAS students, as well as cooperative projects with SEAS faculty.

Guinea Pigs

FREE TO GOOD HOME -- Healthy adult female Abyssinian guinea pig. Comes with all accessories and three months' supply of food and litter. Call Meg Gilbert in Personnel, ext. 2036.

Volunteers: People People

The following volunteer opportunities were submitted to the HOTLINE by the Princeton Area Council of Community Services, a member agency of the United Way-Princeton Area Communities. For further information on any volunteer position, contact each agency directly.

- The Catholic Welfare Bureau of the Diocese of Trenton is searching for painters, maintenance assistants, groundskeepers, and general contracting assistants. Call 609-394-5181 to offer your aid.

- The Delaware-Raritan Girl Scout Council is seeking men and women over age 18 to serve as Girl Scout troop leaders. Leaders conduct one weekly meeting with 10 to 15 girls, plan activities, and organize occasional weekend outings. Volunteers to serve as day camp counselors (training provided) and program consultants, as well as members of the Council's various committees, are also needed. For more details, call the Council at 800-576-2656 or 201-738-8200.

- The E.R. Johnstone Training and Research Center is a co-ed state residential facility for handicapped adolescents and young adults ages 13 to 30.

- Volunteers who will take students on community shopping trips, act as host families for students, or sponsor an off-campus activity are needed. For information on these and other volunteer positions at the Center, call 609-289-2500.

The next three listings were provided by the United Way of Somerset Valley. To learn more about any listing, contact each agency directly.

- The Adult Day Center of Somerset County is looking for volunteers to work with a disabled older adult on a one-to-one basis. Individuals willing to serve as speakers or entertainers would also be welcomed. To lend a hand, call 201-356-1302.

- The Raritan Valley Chapter of the American Red Cross is seeking volunteer help with the Chapter's blood, handicapped riding, and swimming programs. Assistance is also needed for the motor service, social services, and the first aid and CPR courses. If you can help, call the Red Cross at 201-725-2217.

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- The Jerry Davis Early Childhood Center for Handicapped Children needs volunteers willing to work on water adjustment and swimming with individual children in a pool. Assistance in the classroom activities of handicapped preschool children is also being sought. To share a little of yourself with these youngsters, call 201-658-4359.

The following volunteer posts were supplied by the Voluntary Action Center of Middlesex County. For more details about any listing, contact the VAC at 201-249-8910.

- A national charitable organization needs telephone volunteers in the afternoons, evenings, and on weekends. Volunteers may place calls from their home or office. To make the connection, call the VAC.

- A group monitoring the enforcement of fair housing statutes needs fair housing testers. Testers attempt to secure housing, and report back on the treatment they receive. To begin househunting, call the VAC.

- Many charitable organizations need drivers to transport elderly or disabled clients to shopping or for medical treatment. Start your wheels spinning by calling the VAC.

The next volunteer opportunities were supplied by the Voluntary Action Center (VAC) of Morris County. Additional information on any listing is available by calling the VAC at 201-538-7200.

- Since there are no classes and few staff around, weekends can be a very lonely time for handicapped, wheelchair-bound youngsters in a residential treatment center. Your short visit one Saturday or Sunday per month can make a big difference to these children. To become a youngster's 'special someone,' contact the VAC.

- A volunteer administrator is being sought to advise a small child care organization on the process of incorporating community help. Prepare a needs assessment, plan of action, staff orientation plan, and training schedule. Implementation of your plans will be the responsibility of the group, and hours can be tailored to your needs. If you think you'd fill the bill, contact the VAC.

Students seking experience and/or possible college credit this summer are encouraged to register their interests with the VAC. At present, there is a need for a computer operator, environmental and legislative researchers, and a public administration planner. Hours are during the day in a central office location. For more details, call the VAC.

Safety Training

The following Health and Safety training courses are scheduled for July:

Course	Responsible Instructor	Date Scheduled
● Chemical Handling	K. Semel Ext. 2531	To be announced
● Fire Extinguisher Training	S. Larson Ext. 3166	July 9 and 23 2-3:30 p.m.
● Basic First Aid	S. Larson Ext. 3166	July 15, 17, and 19 1-3 p.m.
● Self-Contained Breathing Apparatus	S. Larson Ext. 3166	July 17 9:30-11:30 a.m.
● Cardiopulmonary Resusitation (CPR)	S. Larson Ext. 3166	July 22, 24, and 26 9 a.m.-noon OR 1-4 p.m.

Employees must obtain permission from their immediate supervisor to attend these classes. Supervisors must call the responsible instructor to enroll their employees.

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