PPL HOTLINE
PRINCETON PLASMA PHYSICS LABORATORY
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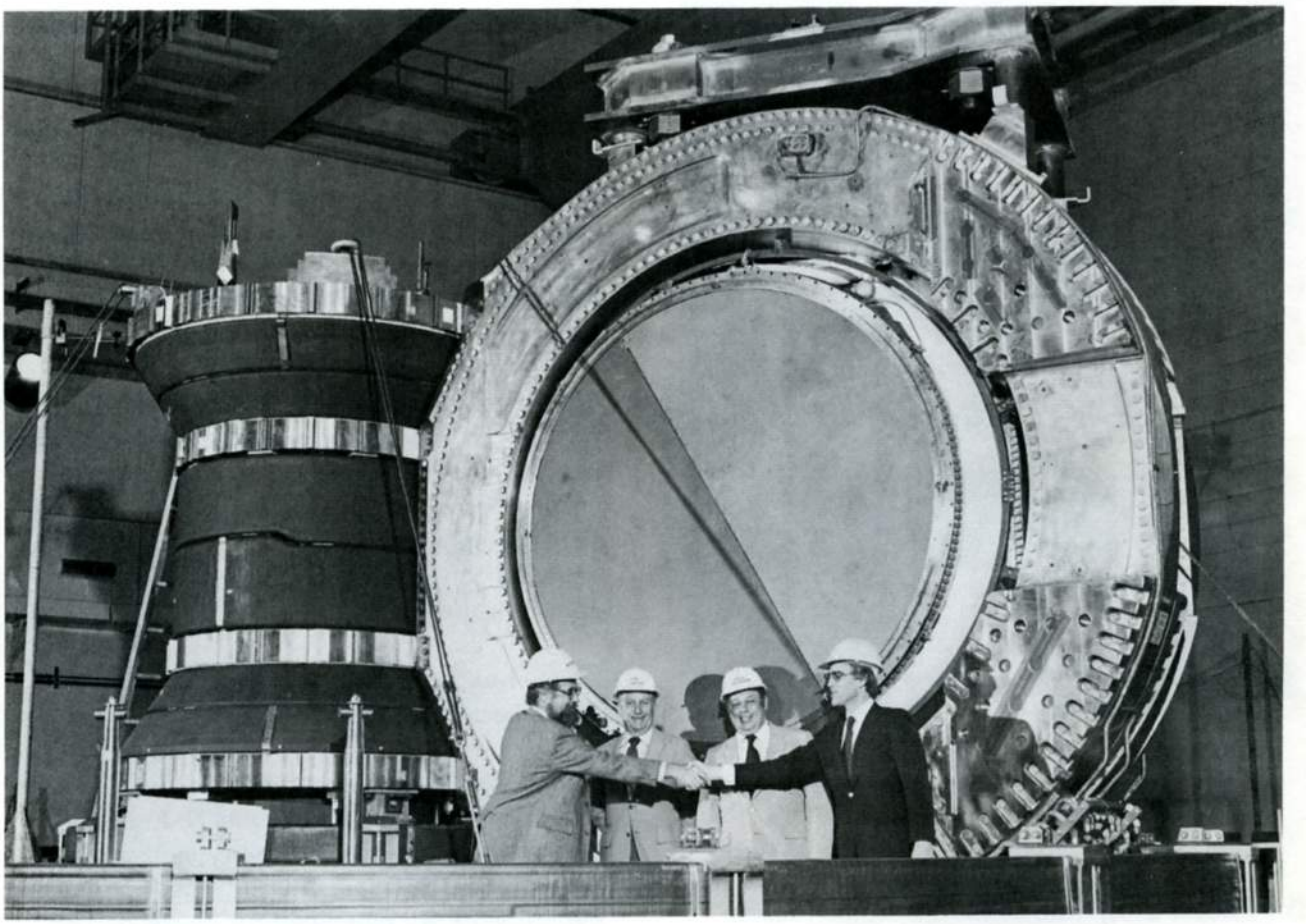
TFTR Module Placement Milestone



Celebrating the recent installation of the first TFTR segment module are (left to right) PPL Director Dr. Harold Furth, TFTR Program Head Don Grove, Associate Director and Head of Technology Paul Reardon, and Dr. Milt Johnson, Chief of the Engineering and Physics Branch of DOE-PFPO.

A major milestone on the road toward TFTR completion was passed April 16 when the first of 10 segment modules was lowered into place in the TFTR Test Cell.

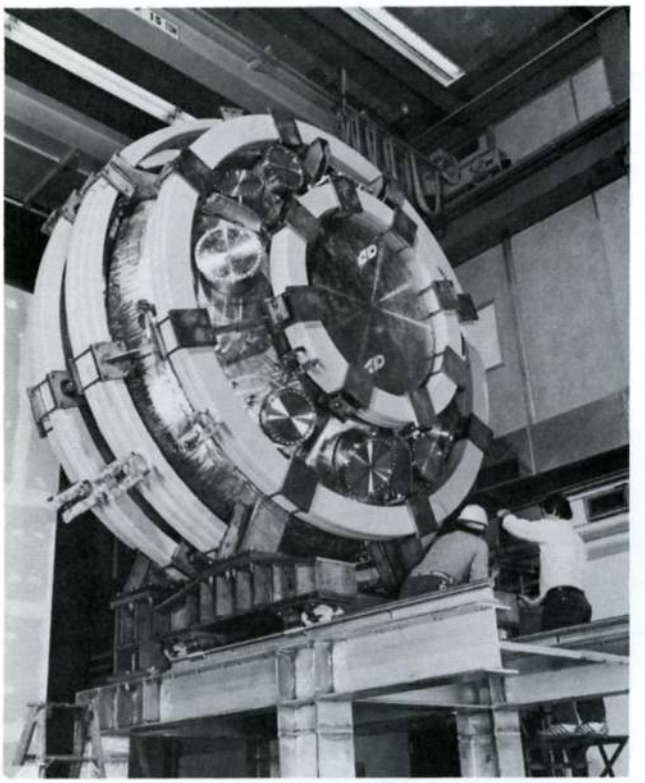
The 72-ton module consists of a slightly curved cylindrical vacuum vessel section, two 25-ton toroidal field coils, and interconnecting support structures. The completed vacuum vessel will weigh 80 tons, and will be surrounded by magnetic field coils composed of approximately 600 tons of copper and insulating materials.

The vacuum vessel segments were manufactured by CBI, Inc. at their Greenville, PA plant. Westinghouse Electric Corporation fabricated the 20 toroidal field coils currently being installed.

Construction of TFTR is slated for December completion.

Spheromak Update

As summer approaches, so do two of the most important milestones in PPL's spheromak program. The machine's PF/TF capacitor banks are scheduled to be ready at the end of May, and fabrication of its flux core is expected to be finished in August. The flux core is technically the most challenging component of the S-1 project.



Testing continues on the Spheromak, which has been mounted on its stand. The machine is due to receive its flux core in August.

Dr. Robert Ellis, head of the spheromak fabrication program, recently said work on the project has been proceeding on schedule. He added that the chemical milling of the flux core's Imonel liner had begun after test pieces successfully survived the process.

The spheromak flux core structure consists of fiberglass-epoxy (G-10) plates, which support poloidal field (PF) windings, an equilibrium field (EF) winding, and a toroidal field (TF) winding. The assembly is wrapped in fiberglass tape and potted into an aluminum shell that helps to "smooth out" the magnetic fields being generated.

The final step is to wrap the core in fiberglass and pot it into its Imonel (a nickel-based alloy) lining. Since the lining has an average thickness of .010" to .015", the final thickness is produced through chemical milling. Although the lining was obtained from an outside vendor, the preparation for chemical milling was done at PPL, which Dr. Ellis called "a rather impressive achievement for our shops."

Quite a bit of progress has already been made toward completing S-1. Coil stacks have been mounted into the machine's second dome, and that dome has been mounted onto the machine structure. Installation of the dummy center section permits technicians to do final vacuum system checks on the machine. The vacuum vessel was successfully pumped down to 10^{-8} torr without difficulty during vacuum shop testing. Electrical leads are being installed while work proceeds on the flux core. Work is also continuing on the S-1 control room.

The spheromak configuration requires external poloidal coils in addition to the toroidal plasma current, but the torodial field is generated entirely by currents that flow in the plasma itself. The spheromak allows a device that is easier to construct, because no toroidal field coils link the plasma.

The S-1 experimental program is directed by Dr. Masaaki Yamada.

Initial goals for the experiment include establishing basic plasma parameters and magneto-hydrodynamic (MHD) stability; and investigating gross MHD instabilities. The first plasma experiments are scheduled for March of 1983.

After Hours Access

In addition to the new identification badges, an access control form has been developed to alleviate inconvenience for PPL employees in the performance of their tasks. Each departmental head will receive a supply of these forms, along with instructions for completion.

If an employee needs access to areas other than those his ID card is programmed for, his supervisor

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should designate those additional areas on the access control form. The employee's ID card code will then be altered to reflect the change, on either a temporary or a permanent basis.

Questions regarding use of the forms should be directed to the Security Office, Chem Science Building, B-Site, ext. 2894.

FTS Usage Change

As of October 1, 1981, PPL is being charged 30 cents a minute for every FTS call. This charge is a nationwide governmental policy, and will be in effect until further notice. Therefore, it is no longer cost effective to use FTS within a 100 mile radius of the laboratory.

FTS should never be used after 5 p.m., and calls placed through an FTS operator should be avoided. If you cannot dial an area code via FTS, use commercial lines.

Planning your calls, and collecting needed information prior to calling, will also save time and money in telephone bills.If your call will be lengthy, check Bell Telephone's charges; in many cases, it will be less costly to use commercial lines.

Be aware that telephone useage is no longer a neglible factor in departmental budgets. Rapidly rising costs have made it an item to watch closely in the future.

Computer Reorganization

On April 16, Associate Director and Head of Technology Paul Reardon announced the formation of a new division within the Technology Department. The CICADA Branch of the TFTR Operations Division of the TFTR program has been merged with the present Computer Division of the Engineering program.

Bob Daniels is heading the new division, with Nick Krisa as deputy head of this division. A new organizational chart will be published by Personnel shortly; in the meantime, Bob and Nick will function as division head and deputy division head for the existing organizations.

Emphasizing the importance of bringing TFTR online, the new division will report to Don Grove, Head of the TFTR program. It will also be in close communication with Ellis Simon's Computer Policy Subcommittee of the laboratory's Technical Operations Committee, ensuring that the global laboratory requirements for computer operation are not jeopardized by this reorganization.

At an appropriate time in the future, this division will be transferred back into a suitable Technology Department unit more appropriate for performing its broader role once the TFTR turn-on and initial operation are brought to a successful conclusion.

Experimental Program Head Dr. Dale Meade (left) and Didier Gambier, visiting staff member from EURATOM/CEA in France (right) escort Tunisian Prime Minister Mohamed Mzali (center) through the laboratory. Mzali visited PPL as part of a speaking engagement on main campus April 26.

Great Adventure Tickets

Discount tickets for Six Flags Great Adventure are now available from Meg Gilbert in the PPL Personnel Office. The free tickets entitle laboratory employees, their families and friends to discount admissions to the safari and theme parks, as well as to reduced rates in hotels near the park. The tickets may be used throughout the 1982 season.

For further information, call Meg at ext. 2036

Obituary

PPL employee Frank Hume, 61, of Morrisville, PA died April 6. Mr. Hume, who joined the laboratory staff as a "B" technician 26 years ago, worked as a specialist on the Monthly Support Staff, Engineering Services, FOM Division. Joe Csenteri, his supervisor, said, "Frank was well-versed in all electrical, electronic and metal skills, and was a valuable, dedicated employee. He was admired and respected by everyone."

Information Fees

As of April 21, NJ Bell Telephone has begun charging customers for Information calls.

The laboratory will be allotted a number of free information calls each month, but every call over that limit will be charged at 10 cents per call. This charge applies to both the 609 and the 201 New Jersey area codes.

Employees should make note of frequently called numbers, and refer to the list before calling information. Additional NJ telephone directories are available from the Telecommunications Department.

Talk Slated

PPL Assistant Director Robert Sheldon will explain "The Financial Management of PPL" to laboratory employees May 24 in the Gottlieb auditorium.

"The laboratory has grown dramatically over the last five years, "Sheldon said, "especially with the advent of TFTR. "He added his hope that his talk will give employees "a sense of proportion and perspective about the lab."

The talk, sponsored by the Human Resources Management section of the Personnel Office, will be presented twice during the day. Employees whose last names begin with A through M are asked to attend the 2 to 3 p.m. session; those with last names beginning with N through Z should come to the 3:30 to 4:30 p.m. session. All employees *must have their supervisor's approval* in order to attend either session.

TFTR Parking

PPL employees – especially those who have occasion to work at the TFTR site – should note that general parking is NOT available on the site. Because of the "exclusion area" concept, long-term plans for the site provide only a few short-term parking spaces near buildings. The existing open areas still belong to the construction contractors, for their exclusive use for storage and parking for their own employees.

In order to accomodate the necessary movement of tools, equipment and materials into and out of TFTR buildings, six 20-minute parking spaces have been provided. If you must park outside a designated space in an emergency, be sure to leave a note on the windshield for the Security Officer. Any special problems involving parking or other access to the TFTR site should be referred to Halsey Allen or the Security office.

The shuttle route has been altered to pass between the TFTR site and the Tech Shop, RF and Maintenance Buildings. Additional walkways in the vicinity of the cooling towers are expected to be provided.

Occupancy of the buildings at the site is a significant milestone in the laboratory's progress toward the goal of an operational TFTR. Everyone's cooperation and assistance in working out the "bugs" that will inevitably occur as progress continues will be most appreciated.

For Sale By Owner

Matthews-built 1903 townhouse on tree-lined street. Seven minute walk to Firestone library, two minute walk to NY City bus. Fully modernized, spacious with elegant craftsmanship. Four bedrooms, 2 ½ baths, dry basement with wine cellar and pantry. Attic and fenced private yard. Principals only, call 921-1786.

Guinea Pigs

Employee Relations secretary Meg Gilbert raises guinea pigs as a hobby.

Currently, Meg has a frisky litter of four available for adoption. If anyone is interested, please call Meg at ext. 2036.

Award Winners

Brian (left) and Mark Brown pose with their awards from the Greater Trenton Science Fair. Mark was the grand prize winner at the Fair, sponsored by the Trenton Engineers' Club and The Trentonia. Both boys are the sons of PPL's Mary Ann Brown.

Mark David Brown, son of PPL's Mary Ann Brown, recently won the grand prize – and many others – in the 30th annual Greater Trenton Science Fair, sponsored by the Trenton Engineers' Club and The Trentonian.

Mark, whose grand prize entry was entitled "Corona Enhanced Heat Exchange," won an all-expenses-paid trip to Houston to compete in the International Science and Engineering Fair May 10 through 15. His project also garnered awards from the U.S. Department of Energy and Western Electric, as well as the U.S. Army Senior Division Physics Medallion.

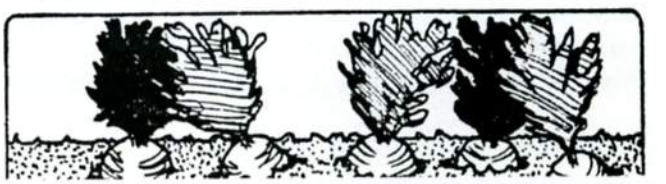
Mark, a 17-year-old senior at Notre Dame High School, is no stranger to winning science fair awards. He entered a project on "Measuring Molecules Using the Langmuir Molecular Film Balance" in last year's Greater Trenton Science Fair, and walked away with first place awards from the Junior Engineering Technical Society, the New Jersey National Bank, and the National Council of Mathematics. The project also earned several other awards at the fair, and won Mark a place in the honors group in the Westinghouse science contest.

Mark has entered this year's project in the second national Space Shuttle Student Involvement Project, sponsored by NASA and the National Science Teachers' Association. He has been selected as a semifinalist in the project; national winners will be announced at the end of May. Should Mark win, his project would eventually be part of the payload of a future shuttle flight.

Mark, who plans to major in engineering in college, will be competing in the SEER Science Fair April 29 through May 2. He has also been nominated to "Who's Who Among American High School Students."

Mark's brother Brian, 13, is no slouch in the science department either. His project, "Balancing Tensile and Compressive Forces," won first place in the junior physical division of the Trenton fair. Brian's entry also received awards from the Junior Engineering Technical Society, Ransome Airlines, and a junior division certificate. He won a number of awards at last year's fair with his project "Surface Tension Experiments."

Brian, a student at St. Paul's School, also plans to study engineering in college.



Garden Plots

Mother Nature fooled with the garden plot program last month, when snows held up plowing of the garden tracts. PPL planters are asked to be patient in awaiting assignment of their plots; applications are being processed as quickly as possible. THERE ARE NO AUTOMATIC RENEWALS OF GARDEN PLOTS; PLEASE DO NOT PLANT UNTIL YOUR PLOT ASSIGNMENT HAS BEEN CONFIRMED!

Forty-one garden plots are still available at the B-Site tract. To reserve one, send your name,

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office address, extension, and location of the site you used last year (if any) to the Human Resources Section, c/o Meg Gilbert, Sayre Hall B-Site.

Gardeners are also asked to avoid driving or walking over the air strip under any circumstances. This practice could pose serious problems to planes attempting to land on the strip.

For further information on the garden plot program, call Meg at ext. 2036.

Evacuation Regulations

Is "smoking" hazardous to your health? Definitely, in the opinion of PPL Fire Chief Jack Anderson.

Chief Anderson reminds all employees that for their own safety, *everyone* must evacuate any structure with a fire or smoke condition. Remaining in or around an affected area without protection could result in the inhalation of some of the hazardous gases produced during a fire. Gases such as carbon monoxide, carbon dioxide, hydrogen sulfide, nitrogen dioxide and a number of other toxins may be present in smoke.

Once evacuated, personnel should not re-enter the affected building until the area is cleared and judged safe by Chief Anderson.

Don't let curiosity be the death of you; stay away from any fire or smoke condition, and allow Emergency Services Unit personnel to do their jobs

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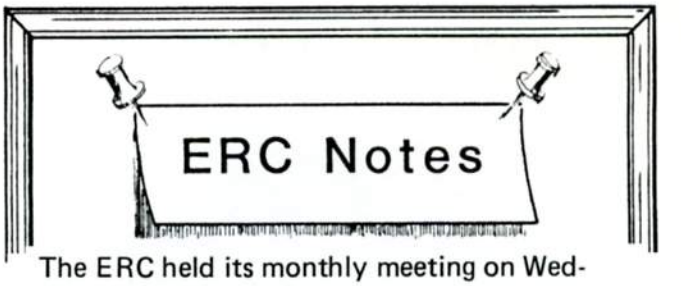
Quilt Exhibit

Quilts designed and constructed by Alessandra Mazzucato and Emily Wolin will be on display in the Dorothy Brown Room of the Princeton University League headquarters through May 14. Both Alessandra (the wife of PPL's Ernesto Mazzucato) and Emily are members of the Princeton YWCA Artisan Guild.

The exhibit may be viewed Monday through Friday from 9 a.m. to 1 p.m. at the league offices.



The ERC held its monthly meeting on Wednesday, April 14.

Len Thomas, in his new role as liaison between the ERC and lab management, presented a written report of progress made on some issues raised at the March 10 meeting with Dick Rossi.

The poor lighting in the parking lots after hours was discussed. It was stated that an employee who feels uncomfortable walking to the lot after hours should call Security and ask to be escorted. The likelihood of obtaining additional lighting is remote.

The grievance policy previously distributed was reviewed. It was suggested that a specific time limit (for each step in the procedure) be stated in the policy.

The cafeteria committee will look into specific complaints regarding the B-Site cafeteria.

Steve Ragolia volunteered to be in charge of the recreation equipment this year.

A question was raised about SOSS seminars being scheduled during lunch hours. Many women feel that this is unfair, as most other groups in the laboratory do not have to use their lunch hours to hold seminars.

The feedback received about the early dismissal on April 7 was that it went much more smoothly than previous snow-closings.

Volleyball

Add experienced players to beginners, and your "net" result will be the weekly PPL volleyball games, which began April 27. Games are played each Tuesday, using nets located in the large field by the air strip. Play begins at 5 p.m. and

continues until darkness falls. Volleyball enthusiasts of all skill levels are invited to play.

For additional information, call Tim Bennett at ext. 2574, Anne Golden at ext. 2444, or George Cutsogeorge at ext. 2119.

J.R. Partiyka, a certified optician with the Fend-All Company, checks the fit on John Vallace's glasses during the monthly PPL safety glasses program. Program coordinator Dick Carlese reported that approximately 40 people have taken advantage of the program since the beginning of the year, "a very significant increase." Monthly visits by the optician are held in the LOB Commons area; for more information about the program, contact Dick at Health and Safety, ext. 2533.

IRA'S In A Nutshell

An Individual Retirement Account (IRA) is a tax-sheltered account which enables you to save on your income taxes *now* while earning money for your retirement years.

Single people can contribute up to $2,000 per year to an IRA. Married couples with only one wage earner can contribute a yearly $2,250 to their IRA account. Married couples with two wage earners may contribute $4,000 ($2,000 each) into IRA's. You can deduct the amount you deposit during the year from your gross income, which means you'll pay less in taxes. Income taxes on money deposited in an IRA (or on the interest the account is earning) are not paid until the money is withdrawn.

Although penalties will be charged for premature withdrawals from an IRA, you can withdraw from your account after you reach age 59½ — even if you haven't retired. You *must* begin withdrawing your money upon reaching age 70½.

IRA's are being offered at the University. Employees Federal Credit Union. Employees have the option of making contributions to their account through payroll deductions. You will earn 8 percent interest per year, which is compounded quarterly so the effective yield is approximately 9.238 percent.

If you prefer to deposit a lump sum into an IRA (assuming that you will have earned income for the year to cover the amount of the deposit), you may purchase an IRA certificate with a minimum deposit of $1,000. The certificate will mature one year from the date of purchase, with interest computed at the rate in effect on the date of purchase. Certificates are compounded daily, so the effective yield is always higher than the annual rate of interest. Check with the credit union business office for current certificate rates.

Anyone interested in further information on IRA's or in opening an IRA account with the Credit Union may contact Florence Wnuk at the business office, ext. 7-2-5038.

Room Renovation

The former Printed Circuit Laboratory in the Matterhorn Building, gutted by fire last year, has now been totally refurbished. It will be housing strain gage installation and instrument fabrication work for Graham Brown's Material Testing Laboratory.

The lengthy cleanup was a concerted effort by employees representing every skilled trade, according to Maintenance Supervisor Walt Weyman, who coordinated the cleanup. Approximately

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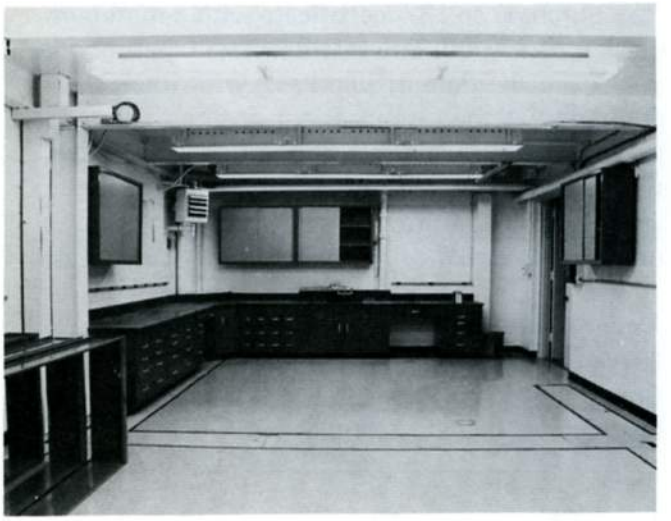
130 man-hours of work were expended during the cleanup.

Walt said the initial decontamination phase was the most tedious and time-consuming step of the operation. All electrical wires and hookups had to be removed, and the walls and floors thoroughly scrubbed prior to painting. "It was a real mess," Walt recalled, "and some real dirty work."

Walt added that the room has "been rebuilt from the bottom up." The ceiling and floor tiles were removed, as was all the equipment in the room. Duct work that could not be repaired was replaced. New lab furniture and new plumbing were installed, and lighting and new electrical work were connected to a new electrical service. A new coat of paint and new flooring completed the job.

PPL employees who worked on the various stages of the cleanup include Ed Gilsenan, Buzz Bauer, John Sadovy, Gerry Hart, Mitch Dorum, Ed Naprawa, Bill Allen, Roy Whitley, Wayne Robinson, Bob Cancel, Joe Perroni, George Kalescky, Doug Gunn and Charlie Smith.



The former Printed Circuit Laboratory in the Matterhorn Building after its lengthy cleanup. The room was gutted by a fire last year, and was rebuilt by Plant Maintenance employees.

Picnic Preview

Mark June 19 on your calendar; that's the date of the annual PPL Picnic. Further information will be published in upcoming issues of the HOTLINE.

Safety Note

If any department needs an Eyeglass Cleaning Station, contact the Safety Office, ext. 2526. Cleaning solution and tissues for stations already installed can be obtained from the stockrooms.

Sue McMahon of Accounting has been promoted from account clerk to administrative assistant. Sue, who has been with PPL for six years, will be handling the major subcontracts for the laboratory.

Travel Tips

The People's Express TV commercials do have a point: Fares for airline travel are confusing. You could be seated next to someone who paid half (or twice) as much as you did for the same seat, same flight, same service, same destination. The best assurance you have for getting what you want is to make your reservation early and not change it!

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Basically, there are direct and connecting flights. But there are variations for each:

A direct flight is either nonstop, or has one or more stops. The direct nonstop flight is the fastest, often the cheapest, and the most likely to get you and your luggage to your destination at the scheduled time.

A direct flight with one or more stops will use more time (needed for passenger boarding, fueling, food), but you do not need to change planes, nor does your luggage have to be moved. Count on at least an hour for each stop.

Connecting flights differ in several ways. Common to all is that there will be a stop and change of planes. Whether flights are online or offline (with the same airline, or carrier; or with a different airline) can make little difference in a small airport, but quite a large difference at O'Hare in Chicago. When an agent tells you that minimim connecting time is one hour at one airport and perhaps ninety minutes at another, the size of the airport is probably the reason; there might even be a change of terminals. When it is necessary to use a connecting flight, the best route is to stay on the same airline if possible.

Since costs are directly related to air miles, a connecting flight can be more expensive than a direct flight. When applicable, a combination fare (less than the total of each individual leg) is quoted. Since combination fares are not included in the Official Airline Guide (OAC), the exact fare would not be known until the reservation is actually booked. However, a direct flight is usually the flight with special fares.

Although there are basically two types of fare construction (economy or first class), the many special fares now available because of deregulation are the fares most people ask for. However, these fares do have restrictions. The restrictions are applied by individual airline and can differ greatly. They include:

- Making round-trip reservation with a minimum and/or maximum time for completion of the trip
- Having a stated percentage of seats available at that price for each flight
- Reservation and/or payment deadlines
- No stopovers allowed
- Different fares for different seasons
- No changes of airline allowed
- Deadlines for changes of reservations (or no changes allowed)
- Cancellation charges

If you think you did not get the lowest fare possible, ask what the fare basis was. Chances are your reservation didn't qualify for a special fare.

Standard operating procedures in the Travel Office are to request the lowest fare on American carriers. A slight change in your itinerary might be suggested in order to quality you for a lower fare. For example, if a difference of two hours on departure does not make a difference to your schedule, it might allow online connections or use of the same airline for the entire trip. This could save money on fares.

If you do have personal requests, make them know at the time of the original reservation request. Special assistance at airports, special dietary needs, seating arrangement, charging your ticket through a credit card – these can be handled more easily if known in advance.

Remember, too, that every time you change your reservation you are adding to the cost of doing business – for the airline, for whoever writes the ticket, and for yourself.

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

SOSS Festivities

The Secretarial and Office Support Staff (SOSS) held their annual Secretaries' Week party April 23, and a good time was had by all.

Following an introduction by SOSS chairwoman Muriel Strohl, laboratory Director Dr. Harold Furth welcomed the attendees and praised PPL secretaries. New Associate Director James Clark was the main speaker at the party.

The SOSS presented plaques to Millie Lefler of PDX, Ellie Weed of Procurement, and Eleanor Rosfjord of Accounting. All three honorees are retiring from laboratory service.

Jack Hart and Roy Little drew names to receive several hanging baskets. Plants went to Sandy Winje, Charlene Onofri, Flo Short and Verna Weyman.

The highlight of the afternoon, however, was Dee Hurley's rendition of "TFTR", sung to the tune of "New York, New York". Joining Dee were the "Fusion Enerjazzers", a "chorus line" consisting of Don Cardin, John Clarke, James French, Don Grove, Paul Reardon and Robert Sheldon. Dee received a plant from the SOSS in recognition of her efforts in organizing the entertainment portion of the party.

The party was catered by the C-Site cafeteria staff, and was organized by Anne Golden and her assistant, Laura Steer. SOSS seminar committee members who worked on the party include Gloria Pollitt, Mal Pulaski, Edna Willis, Dot Pulyer and Helen Quinn.

SOSS officers were also introduced during the party. Ann O'Day is vice-chairwoman of the group, with Anne Golden as recording secretary, Dolores Bergmann as corresponding secretary, and Flo Short as past chairwoman.

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Cooperation Aids Canadians' Research

Benoit LeBlanc (left) and Barry Stansfield

International cooperation has always been the rule rather than the exception in the fusion community. An example of that cooperation involves Benoit LeBlanc and Barry L. Stansfield, two Canadian physicists doing experimental laser work at PPL.

The pair's experiment involves what could eventually become a new plasma diagnostic. "We're exciting hydrogen atoms with a dye laser, "Ben explained. The dye laser is used because its wavelength can be changed; "not all lasers are tunable, " he continued.

"We tune the laser to the exact transition wavelength for hydrogen H-alpha radiation, and shoot it into the plasma. The excited atoms then radiate photons, and we try to read their scattered signals."

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The experiment provides information on the local distribution of excited atoms; in order to measure the total neutral density, the data must be combined with a collisional-radiative model and computed. The neutral density so determined is then compared with existing codes in order to understand neutral atom transport.

Barry recalled that he and Ben were "working on this experiment at the Institute National de la Recheche Scientifique (INRS) laboratory in Montreal. Boris Grek (who works on Thomson Scattering in PDX) was a former professor at INRS, and we've kept in contact with him. He made the arrangements for us to come here, and we've been working here on and off since October."

Barry and Ben's project is associated with Dirk Dimock's Laser Optics Group. "We're tied in with the optics being used here, "Ben said. "Those optics are optimized for Thomson Scattering, however, not flourescence observation. That's a problem, since the volume of the plasma interacting with the laser is very small, and the signal-to-noise ratio is very low."

Barry explained that the laser's light shines on one portion of the plasma, and readings must be taken against the surrounding plasma environment. "It's like having a spotlight shining in your eyes, and trying to tell whether a flashlight being held next to the spotlight is on or not. You need rather sophisticated equipment and good data aquisition handling to extract the signal from your observations. Believe me, it's hard!"

The duo's next step, according to Ben, will be to numerically combine the results from several experiments in order to increase the effective signal. This should allow more fine-tuned reception of the signal from the plasma-laser interface.

"We've learned a lot by having to make our system work in the tokamak environment," Barry contends. "It's quite a different kettle of fish from making it work in the laboratory!"

Both men are hoping to use the expertise gained at PPL in Canada's infant fusion program. "The Canadian physics strategy is how to get involved in the international fusion club. We now have the money to build a tokamak; it will be smaller than PLT, and a shade smaller than the ISX. We'll be developing non-standard diagnostics to use on the machine, and we'll also be experimenting with reversing current in the plasma," Ben concluded.

Approximately $35 million has been budgeted for the project, which will be located near Montreal and is expected to be completed by the end of 1984.

"Our experience here has been a real learning experience in that respect," Barry feels, "since few scientists in Canada have really experimented on tokamaks. You can almost think of us as missionaries!"

If the two are missionaries, they're hardly in an unfriendly country. "We've had a tremendous reception here at PPL," Barry enthused. "It's amazing how stimulating an environment you have here. You get the feeling the scientists know what they want to do, that they're concentrating all their efforts on it, and that's producing the world's best work. The quality of people here is extremely good, and their openness and helpfulness is great. They always seem to have time in a busy schedule to talk to us, or give us a hand. PPL has an extremely friendly atmosphere, from the top to the bottom!"