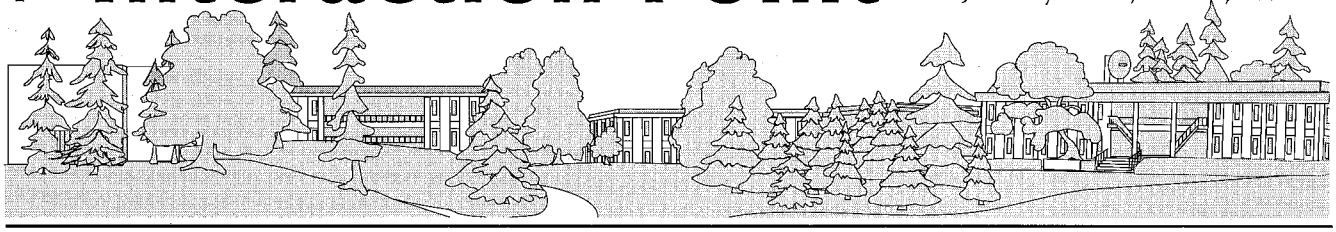
The Interaction Point

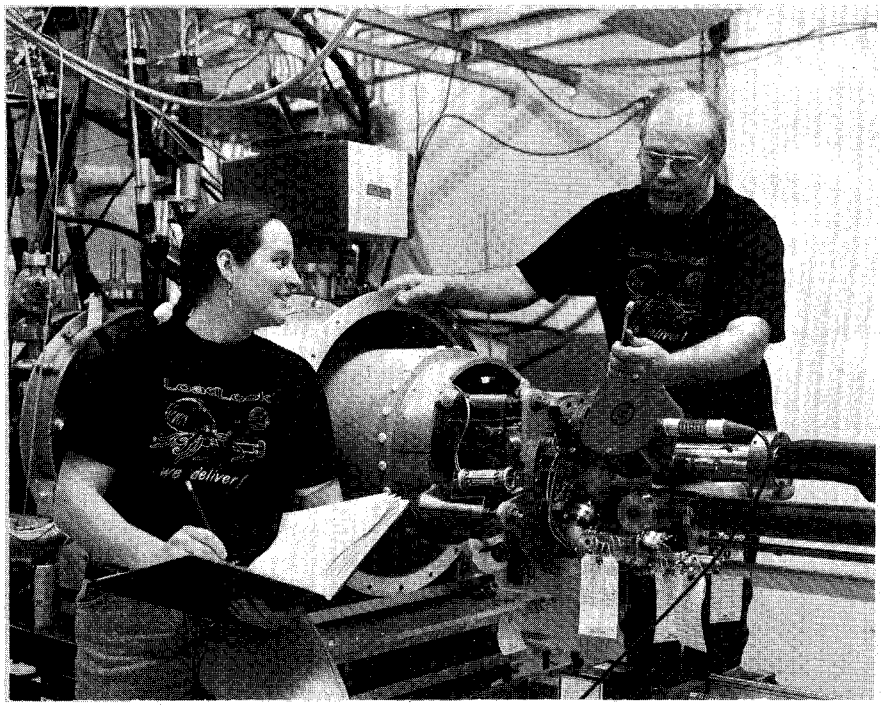
Events and Happenings
in the SLAC Community
January 1993, Vol. 4, No. 1



Locking Up Success

LOADLOCK IMPROVES ELECTRON GUNS' PERFORMANCE

by Bob Kirby



Cathy Carr, Mechanical Design, and Jerry Collet, Physical Electronics, fine tune LoadLock in the Polarized Gun Lab.

BACK IN THE UNCERTAIN days of a year ago (and prior to last summer's spectacular SLC/SLD 10,000 polarized Zs beam run), attention was focussed on improving the long-term performance of the polarized electron guns. Among the many useful suggestions was a plan to add a "loadlock" to the gun. Many of you have heard the term bandied about but. . . .what, exactly, is *loadlock*???

To answer that question, one needs to know a little about how these polarized electron gun beasties (and they surely are) work. In their most elegant sense, they are boxes with an opening connected to the accelerator. The box produces electrons that are injected into the accelerator. These electrons are unusual in that they are polarized, which is a kind of characteristic in the same way that color is a characteristic of clothes. For a

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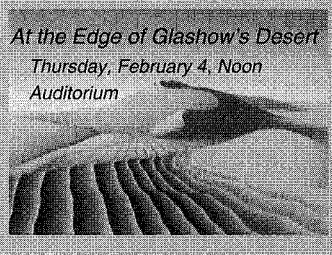
SLAC Film Fest



SOME OF YOU may have noticed film crews traipsing around SLAC the past few years, led by a pipe-smoking director. Well, their efforts have finally borne fruit, in the form of an hour-long program on high-energy physics titled "At the Edge of Glashow's Desert," aired this month by the British Broadcasting Company. The focus of the program is upon the physics research done at electron-positron colliders, namely the SLC and CERN's 17-mile LEP ring. It stars our own Director, Burton Richter, with physicists Martin Breidenbach, Gary Feldman, Nan Phinney, and Helen Quinn in supporting roles. Numerous other SLAC employees also appear in the program.

As the program has not yet been released in the United States, the Information Services Group plans to show it in the Auditorium at noon on Thursday, February 4. After that there will be a 20-minute program on the construction of the SLD detector, based on time-lapse photography. All members of the SLAC community are welcome to attend. Please be there at noon sharp to claim one of the seats, which will probably be in short supply. And bring your own popcorn!

LOADLOCK TEAM DELIVERS

(Cont'd. from page 1)

discussion of polarization and electrons, see Lowell Klaisner's exposition on the subject in the April-May issue of *The Interaction Point*.

Polarized electrons are produced by shining laser light on specially prepared semiconductor wafers that are part of the gallium arsenide family of compounds. The trick is that in order to get these materials to work properly, the box must be under vacuum and squeaky clean. In order to make the box "clean," it is made of stainless steel and heated to a high temperature (about the "broil" setting on a kitchen oven). Prior to last fall, the wafer was in the gun when the heating took place, and various bits of microscopic sludge from the interior walls of the box settled on the wafer and degraded its ultimate performance. That's where a loadlock comes into the picture.

The plan is deceptively simple: heat the gun without the wafer and then, after cooldown, insert the wafer into the box and proceed with the steps that make it a polarized electron photoemitter. One "loads" the wafer through a "vacuum-compatible lock," hence, loadlock. Oh, if *only* it were that simple!

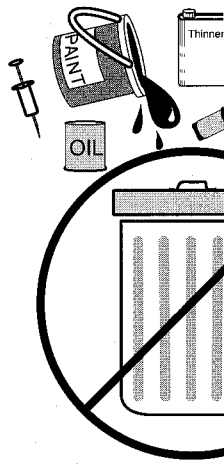
As with many highly technological devices, there are other considerations. Some of the processing done to the wafer in preparing it to be a good photoemitter proves harmful to the gun itself. So LoadLock (time to give it a personality) not only delivers the wafer to the gun but processes it before doing so. There is a chamber integral to LoadLock with eleven ports (known as the unidecapus or, affectionately, UDP) where the wafer gets cleaned and sprayed with activation coatings. For all the world, it looks like very nifty plumbing (see the photograph on the first page).

LoadLock has a very nice bonus built right into it. It has its very own LLoadLLock! Four wafers can be loaded at one time so that, as the latest high polarization wafer materials are produced for SLAC by groups at other universities and companies, they can be almost immediately put to work without changing the polarized gun itself, as was required in the not-so-distant past. Two LoadLock units were built, one in use at the Cryogenics Building Polarized Gun Lab and the second installed on the Accelerator. Gun Lab tests have been very encouraging with some of the best-ever photoemitters being produced routinely. Hopes are running very high for the upcoming SLC/SLD run next month.

From first glimmer in the mind's eye to installation in the Gun Lab, the initial unit took eight months, a remarkable achievment considering the complexity of design and construction. That was only possible because of the unflagging support and effort on the part of hundreds of people at SLAC. I don't have room to identify them all here but the yeoman efforts of the Mechanical Fabrication Department and the Mechanical Design Group are particularly appreciated. Jerry Collet (whose hairline graces our T-shirt unidecapus) and Cathy Carr (whose artistic talents are evident on the shirt) gave many an evening and weekend to push the project through to completion. Knut Skarpaas, whose expertise and professionalism are much appreciated, designed the cathode insertion device. Lowell Klaisner took the heat and managed the budget. Full polarization ahead!!

Household Hazardous Wast

MANY OF US VISUALIZE HAZARDOUS or toxic waste as a picture of chemical plants spewing clouds of smoke into the air or people in moon suits loading drums laden with toxic chemicals onto trucks to be buried at a hazardous waste dump. Most people do not realize, however, that some of the same toxic or hazardous materials they use in their own homes, and toss into their trash, are the same they fear industry is mishandling. When they toss these household chemicals into their trash, they too are potentially polluting the environment and creating human health hazards.



The term Superfund Site refers to sites identified by federal and state governments where hazardous chemicals or wastes have been intentionally or unintentionally deposited or spilled. Because of the extent of contamination, these site may pose serious health or environmental hazards. Once a site has been designated as a Superfund Site, it must be cleaned up. The cost of cleanup is enormous and is passed on to all of us in one way or another. The average cleanup cost for a Superfund Site is $130 million. The Environmental Protection Agency estimates there are currently 1400 Superfund sites, and this number could increase to 3000 before all sites have been identified. Thirty percent of all Superfund sites are municipal landfills, that is, the community refuse landfills where "non-hazardous" wastes are disposed. This waste is mostly from household wastes. A

FOLLOWING IS A LIST OF COMMON HOUSEH
separated from trash and be taken to household

Drain openers/cleaners	Oven cleane
Furniture polish	Shoe polish
Rug/upholstery cleaners	Chlorine blea
Scouring powders	Aerosol spra
Solvents/degreasers	Paints/stains
Wood preservatives	Pesticides
Photochemicals	Pool chemic

Hazardous materials that can be taken to recycli
antifreeze

e Requires Special Disposal

good example of mishandled household waste is used motor oil.

Remember the Exxon Valdez oil spill in Alaska and the environmental damages that resulted? That spill is dwarfed by the intentional dumping of used motor oil into storm drains, sewers, and municipal landfills every year. It is estimated that five to seven times the volume of oil spilled in the Valdez accident is annually deposited into landfills and storm or waste water systems in Los Angeles alone. It is also estimated that 12 million gallons of used motor oil runs annually into San Francisco Bay from improper disposal. These disposal problems produce environmental damage. Ironically, used motor oil is recyclable and need not be discarded as a waste.

There are many things we can do at home to reduce or eliminate improper disposal of household wastes. We can separate hazardous waste from non-hazardous waste. Once separated, these hazardous wastes can be taken to local Household Hazardous Waste (HHW) Collection Day centers for safe treatment and disposal. Also, many hazardous wastes can be taken to recycling centers for recycling. All counties are required to establish dates for household hazardous waste collection. The dates and locations for these collections days is available by calling the HHW Hotline (415) 363-4718. The California Waste Oil Recycling Hotline number is (800) 553-2962. This hotline provides information on the locations of waste oil/antifreeze recycling centers.

—Ray Jensen

OLD HAZARDOUS MATERIALS that should be
hazardous waste centers on collection days:

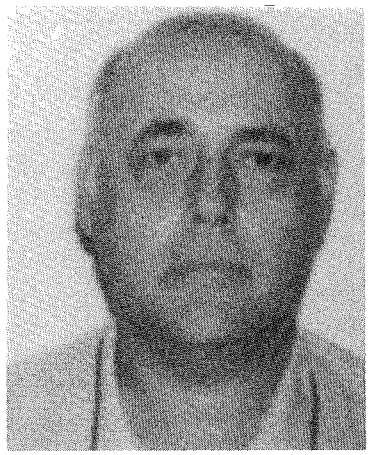
rs	Silver polish
	Spot removers
ch	Toilet bowl cleaners
ys	Air freshner
	Paint remover
	Chemical fertilizers
ls	Rodenticides

g centers are used motor-oil, auto batteries, and

In Memoriam
Bill Miller

BILL MILLER PASSED AWAY unexpectedly on Thursday, October 1, at the age of 54. His death came as a great shock to all who knew him, because he was in apparent good health.

Born in Alameda and graduated from Hayward High School, Bill served as an electrician in the US Navy from 1956–1960 and then for Kaiser Aluminum in San Leandro. After the plant closed in 1988, Bill came to work at SLAC in the process instrument shop.



A tireless worker with great self-motivation, a talented troubleshooter, and a natural leader, Bill cheerfully and competently completed any assignment. These talents earned Bill the distinction of specialist in the instrumentation group.

In addition to his technical ability, his colleagues said he was a true friend to all he knew, always ready to help anyone, on the job or off. "He commanded respect," Bill's colleague Phil Cutinno said. "If you knew him you'd have respect for him. He was well liked."

Bill was active in youth organizations such as 4-H and soccer and was a member of St. Bartholomew's Episcopal church in Livermore. He was also a great outdoorsman and loved to hunt.

According to Pat Conroy, Bill's personality came through in these activities, especially in 4-H. Pat said that because of Bill's involvement in 4-H he spent a lot of time at the Alameda County Fair. One year in talking with his wife Marie about the pie-baking contest he declared that he could bake a pie as good as those. Marie didn't believe him and told him to go ahead and try. With probably the first pie he had ever made he won first place. "I asked him how he learned to make an apple pie, and he said he just followed the directions to the letter," Pat said. "He was very diligent on the job too."

Bill is survived by his wife, three sons, his mother, a brother, a sister, and one grandchild.

—Pat Conroy and Trevor Payne

Welcome Guests and New Employees

Ali Amiri, SSRL, APC; **Hideki Aoyagi**, Accelerator Department; **David Atwood**, Theory; **Huijun Cui**, A/T Beam Dynamics; **Stephen Fetzko**, Experimental Group C; **Jeff Forshaw**, Theory; **Laurie Gennari**, Information Services; **Saul Gold**, Klystron Testing; **Tazdin Gulamani**, Accounting; **Xiaoqing Hu**, Experimental Group C; **Erik Jongewaard**, Klystron Manufacturing; **Fang Li**, Experimental Group C; **Hartmut Luecke**, SSRL; **Edwardo McGee**, Operational Health Physics; **Alfred Mueller**, Theory; **Dieter Mueller**, Theory; **Serge Ratkovsky**, Power Conversion; **Ron J. Sanchez**, Environment Protection and Waste Management; **Ivan Schmidt**, Theory; **Timothy Slaton**, Accelerator Operations; **Teresa Smith**, Accelerator Operations; **Daryl Sprehn**, Klystron Tube R&D; **Jacques Weyers**, Theory; **Louis Witten**, Experimental Group E; **Changchun Zhang**, Experimental Group C.

With the Best to Come

CAROL COLON RETIRES AFTER 24 YEARS

CAROL COLON HAS RETIRED from her position in Employment after 24 years of service. She came to SLAC in April 1968 as a clerk-typist in Personnel and moved into the area of Employment shortly thereafter.

Carol's early responsibilities involved supporting all aspects of the recruitment and hiring process. As the department and the Laboratory grew, and as additional support staff were added, she assumed other duties including direct responsibility for all student employment, both academic year and summer hires, as well as the placement of recruitment advertising for departments.


Carol Ann Colon

Carol Colon

The one functionthat stayed part of Carol's position, and which she handled so well, was to bring new employees on board in a pleasant and trouble-free manner.

Carol's job was typical of many that we tend to take for granted but which requires a high level of efficiency and accuracy. She achieved that level of performance in her quiet, unassuming way. In 1979 when 67 people came from SCIP (now SCS), Carol helped put the staff on SLAC's payroll, and she has a commendation in her file for having handled over 3000 items of information that were entered into the database virtually errorless.

While Carol got to meet almost every new employee through the sign-in process, she also interacted with hiring departments on a regular basis, offering information on the status of requisitions; worked closely with Personnel Records, Medical and Benefits to see that all necessary information was correctly transmitted; and provided support to other areas within Personnel.

Carol has been a valued member of the Personnel team. She performed her duties under only general supervision—we all relied on her to do the job right the first time. In fact, there were many occasions when she provided us with helpful suggestions or reminders and brought errors or oversights to our attention. Her historic perspective and knowledge of practices and procedures served our department and the Laboratory extremely well.

Carol is leaving SLAC, but the Colon family is still well represented. Her daughter, Carol Ann, has been at SLAC since 1980 and works in the Travel Department; her son, Jeff, joined SLAC full time in 1987 and now works in the Health Physics area of ES&H.

A hearty thank you from all of us for 24 years of service, and our best wishes for a well-deserved retirement.

—Hilda Korner

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OLD GREEN CARDS BEING PHASED OUT

IN AN EFFORT TO LIMIT the number of documents used for employment verification and reduce fraud, the Immigration and Naturalization Service (INS) recently announced that Form I-151 Alien Registration Receipt Card (the older version of the green card) will be phased out over the next year. Before August 2, 1993, holders of this card need to apply for Form I-551, the newer version of the green card. After August 2, 1993, Form I-551 will serve as the exclusive Alien Registration Receipt Card for use by aliens lawfully admitted for permanent residence.

The I-151 was last validly issued in 1977 and the Service estimates that 1.5 million of the older green cards are in circulation. Lawful permanent residents in possession of Form I-151, who are eligible, may opt for naturalization rather than replacement of their green cards.

Aliens needing to replace their green cards need to apply to the INS on Form I-90 Application to Replace Alien Registration Receipt Card. The I-90 must be filed in person at the INS office having jurisdiction over the applicant's place of residence. If you reside in Santa Clara County and southward, apply at the INS office in San Jose at 380 South First Street, Room 1150, San Jose, CA 95113. The INS office in San Francisco, serving residents of San Mateo County and northward, is located at 630 Sansome Street, Suite 200A, San Francisco, CA 94111. The form must be accompanied by two photographs and a $70 fee.

Information on acceptable photographs and the application forms can be obtained by calling 1-800-755-0777.

—Ruth Thor Nelson