



In January Steve Schwoegler was named Business Office Manager and he has added Linda Nelson to the ACCOUNTING office staff. Nancy Onken left us after 20 years of service and Bonnie Grapenthien has taken over the responsibilities as Purchasing Agent. Gail Movrich has been added to the PURCHASING office staff. Mary Greenheck has been added as PERSONNEL Manager.

In the INSTRUMENT SHOP Andy Johnson, an Instrument Maker, is on extended leave of absence due to illness. New staff are: John Archibald, Richard Wampole, and William Koenig. We are currently recruiting for a Stockroom assistant due to the untimely death of Ron Dilocker.

WHAT CAN PSL DO FOR YOU?

The staff of PSL is eager to answer any of your questions regarding our many services in engineering, electronics, proposal writing, scientific word processing, computing, drafting, welding, etc. Contact Linwood Thomas, Mechanical Coordinator; Art Penpek, Electronics Coordinator; Ann Varda, Computing; or Lois Blackburn, Word Processing for any particular needs you may have.

MAILING LIST

If there is anyone you are aware we have missed from this mailing list please contact the PSL receptionist with those names. Thank you.

PSL OBSERVER

PHYSICAL SCIENCES LABORATORY

3725 Schneider Drive, Rt 4

Stoughton, WI 53589

(608) 873-6651

Murray Thompson, Director
Esther Olson, Assistant Director

OCTOBER 1984

A NEW LOOK

Some of you may have noticed that you have not received the PSL Observer for some time. This drought is the result of administrative changes in PSL and its research arm, the Synchrotron Radiation Center (SRC). On July 1, 1984, the SRC became a separate unit within the Graduate School. With the impending changes, it seemed wise to curtail the newsletter mailings until after the changes had been implemented.

For those of you not familiar with PSL and SRC, a brief introduction is in order. PSL is a Madison Campus service facility providing high level technical support to the University's research and instruction. In the past, it has also been the parent department for a national research facility, the Synchrotron Radiation Center (SRC). Over the past several years, the SRC has been growing, with rapid expansion occurring in the last year. It became clear that SRC's mission as a national research center was quite different than PSL's mission of providing service. It was decided, therefore, that the facility should split into two separate units.

Although the two units are officially separate, they will continue to share administrative, business and personnel services. Each unit will have its own secretary; Lois Blackburn at PSL and Roberta Ward at SRC but will share the following staff:

Personnel Manager - Mary Greenheck
Accounting Office -
Barbara Johnson
Linda Nelson
Purchasing Office -
Bonnie Grapenthien
Gail Movrich
Stockroom -
Carmen Tortorici
Receptionist -
Carole Fosdahl
Campus deliveries -
Jerry Mickelson

If help is needed in any of these areas, please contact the appropriate person as listed above. We hope this information will be useful in your dealings with both PSL and SRC.

NICOLET INSTRUMENT CORPORATION -
Mr. Duane Littlejohn -

PSL is working with Nicolet on a project in which we are providing a hardware package for Nicolet's Micromax 5000 data system. Bonnie Maron has the responsibility to develop the software package for the control program while Mark Werner engineered an interface board to plug directly into the Micromax 5000. Paul Schultz provided the P.C. artwork for the interface board and Ed Wille supervised the chassis fabrication.

DONE CROSSPOINT -
High Energy Physics/Fermilab

Mark Werner is designing a unique interface called the DONE CROSSPOINT. The Done Crosspoint will allow 16 trigger processors to control 256 scanner units in the Collider Detector

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Assistant Director - Esther Olson
Business Office Manager -
Steve Schwoegler

Facility (CDF) at Fermilab. The interface will allow reallocation of scanner units between processors. Paul Schultz, Ed Wille, and Bill Riederer are assigned to build the various boards and the chassis for the Crosspoint system.

MAGNET STEERING POWER SUPPLIES AND CONTROLLERS - SRC Aladdin

Dan Grim and Ed Wille fabricated seven power supplies and controllers for Aladdin. These are duplicates of existing units that are presently operational at Aladdin.

CHEMICAL ENGINEERING - Professor Warren Stewart

PSL is working with Professor Stewart on an experiment which he would like to measure the heat transfer in a packed bed of spheres by using thermistors. PSL would help put together a computer system to allow temperature measurements to an accuracy of 0.001 degree celsius utilizing a special bridge circuit that senses the changes in the thermistors. Rick Roeffers and John Anderson are engineering the system.

USDA BARLEY AND MALT LAB - George Robbins

Mark Werner has designed a Z80 based controller for Dr. Robbins to upgrade their timed steep tank apparatus. The controller allows the controlling of up to 48 solenoids. A terminal is used to inspect the solenoid selection and activation time. The terminal also displays the status of all solenoids. Ed Wille constructed the interface. Mark also provided the software to perform all the necessary functions of the steep tank controller.

ADMINISTRATIVE DATA PROCESSING (ADP) -

Mark Werner has been consulting and helping ADP with optical isolation installation for the parking gates at various UW parking lots. Mark designed

the optical isolation units while Ed Wille and Dan Grim fabricated the devices. The units will help eliminate most of the damage to the parking gate electronics caused by lighting.

MICROBEAM PROJECT - Professor James H. Abbs, Waisman Center

The construction on the Microbeam project is taking shape. The mechanical structure in the Abbs temporary room is quite a sight to see. The computer (VAX 11/750) is in place and several custom designed electronic modules are being tested with the computer.

Paul Anderson, Mark Werner, John Anderson, Phil Robl, Don Holly, and Dan Wahl have designed various interfaces for the Microbeam project. Ed Wille, Dan Grim, Paul Schultz, and Bill Riederer have wired several large boards and fabricated many chassis to house the boards and the associated power supplies.

MEDICAL PHYSICS RADIOLOGY DEPARTMENT - Professor Charles Mistretta -

John Hicks has finalized the engineering and documentation on the Digital Video Imaging Processing (DVIP) unit. This excellent system which can digitize, store and process images from a conventional radiographic TV fluoroscopy system was conceived by Professor Charles Mistretta and designed by John Hicks.

CHEMICAL ENGINEERING DEPARTMENT - Ruth Stock

John Anderson has designed several small circuits to be interfaced to some dielectric spectrum measuring equipment. One unit is a Fourier synthesized pseudorandom noise (FSPN) generator. Another circuit is a preamplifier, and a third is an interface between the preamplifier and a correlator. The interfaces will be used by Ms. Stock for her research at the Chemical Engineering Department.

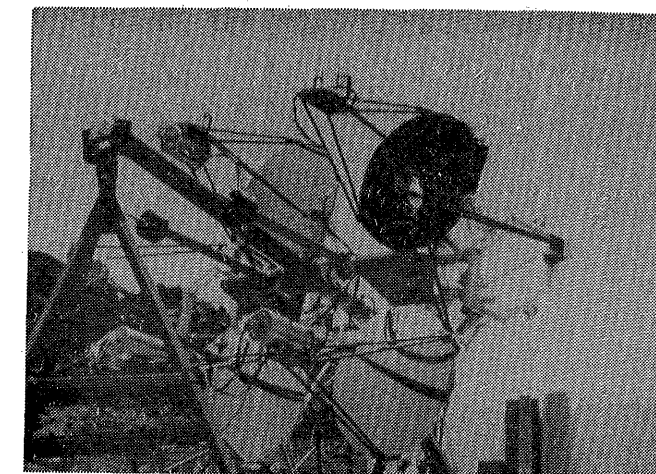
a high-speed coincidence logic circuit which demands that some minimum number of tubes have fired in a short (5 ns) time window. When this condition is met, the sizes and arrival times of the signals are digitized and stored in a computer (LSI 11/23). An additional cluster of PMT's placed 4 degrees off the mirror axis provides a continuous monitor of background light.

This technique of detecting atmospheric Cherenkov light was first demonstrated 30 years ago. Many improvements since then in PMT design and fast electronics have led to more sensitive detectors for ground-based gamma ray astronomy. Existing telescopes all have effective energy thresholds of about 10^{12} electron volts or above thus limiting observations to a few bright sources. Due to the fast timing, our apparatus should be 10 times more sensitive with comparable light-collection area. This should permit a significant increase in the number of observable sources.

The initial focus of our research will be pulsars. To date there are four confirmed sources of high energy gamma rays: the Crab and Vela pulsars, Cygnus X-3, and Centaurus A. The periodicities and brightness of these objects make them obvious candidates for initial study. Our greater sensitivity, however, should lead to relatively prompt measurements of both period and phase of fainter sources and also allow correlations of gamma ray emissions with other regions of the spectrum such as X-rays and visible light.

Based on our experience with the "MARK I" version of the gamma ray telescope, we anticipate developing a optimized design, probably employing a larger number of smaller mirrors. A second multi-mirror telescope placed 100 meters from the first would improve the angular resolution and facilitate rejection of the proton shower background.

The Gamma Ray collaboration, especially its Wisconsin members, wishes to thank Murray Thompson, Linwood Thomas, Tom Winch, Bill Cotter, and many others on the PSL Staff for their support, assistance, and patience. A new experiment in a new discipline presents unusual challenges and PSL has again demonstrated its capability to respond. As our program develops we anticipate a continuing productive relationship with the lab. "Here today, gone to Maui!"



THE GAMMA RAY TELESCOPE IN PLACE AT THE SUMMIT OF HALEAKALA

STAFF NOTES - 1984

Within the structure of PSL we have added several new ENGINEERING faces, Donald Thielman, Daniel Wahl, Gary Bewick and Richard Roffers; and lost Paul Anderson and Joe Lackey. The COMPUTING staff has seen the additions of Bonnie Maron, John Kehres and has one further vacancy to fill, and we saw the departure of Tom Moog and Dave Schwendeman.