

The Village Crier



National Accelerator Laboratory

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PROGRESS REPORT - SEPTEMBER 18th through SEPTEMBER 24, 1972

The accelerator provided 200 BeV beam on September 18th and 19th for a number of emulsion experiments in the Meson Laboratory. Beam was detected in the P Central building of the Proton Laboratory for the first time at 3:40 a.m. on Friday, September 22nd. 200 BeV beam was again available for experiments at the end of the week.

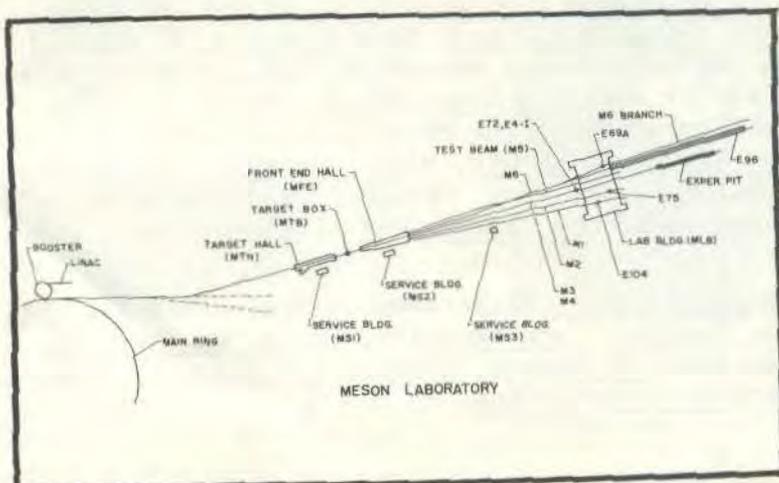
MESON LAB OPENS FOR BUSINESS WITH A BIG ORDER

(Editor's Note: The NAL Meson Laboratory staff has been driving hard toward completion in the last few months. Their efforts to finish are equalled only by the smashing success of the first experiments already carried out there. Art Greene, Physicist on the staff of the Director's Office, and Alan Wehman, Physicist of the Meson Laboratory, have contributed the following information on this newest operational area of NAL.)

On Wednesday morning, September 20, 1972, the NAL Meson Laboratory completed a task which will be difficult to surpass again in the near future - the completion of nine experiments within a four-day period. Over forty "stacks" of nuclear emulsions were exposed to 200 BeV protons. Physicists from Poland, India, France, Japan, the U.S.S.R., and the United States arrived at the International Conference held recently at NAL, with individual emulsion detectors, effectively bringing their experiments in their suitcases. It remained for the visiting physicists and NAL personnel to make the final preparations for the exposures.

Historically, nuclear emulsions were the detection media used for some of the first studies of high energy particle interactions. Due to their light weight and small size, they are still frequently used as a detector of cosmic ray interactions in flights of high altitude balloons or satellites. The emulsion material itself is very similar to that used for photographic film, but is produced in sheets up to 1/16" thick and without a backing. A "stack" is formed by several layers of emulsion, bound together and sealed from light. Normally, the stack is exposed to a few hundred thousand particles, some of which interact in the emulsion material producing the interactions of interest to physicists. The emulsion layers are then mounted on glass plates, and undergo an elaborate development process to unveil the traces of particles. Analysis is done exclusively with microscopes, and it takes many months to locate and analyze a few hundred events of interest. Because of this, the primary effort for the experimenter follows the exposure and

(Continued on page 2)



...This drawing shows the external proton beam path to the Meson Lab Target and the six secondary particle beams (M 1-6), produced from interactions in the target box (MTB). Also, the Main Laboratory Building (MLB) (under construction). Other buildings and enclosures on the line house the beams and the experiments which use the beams.

Indicated also are the first experiments utilizing each beam (E-72, E4-I, E-69A, E-96, E-75, E-104)...

MESON LAB'S BIG ORDER (Continued)

and does not precede it, as with many high energy physics experiments.

The Japanese physicists, who participated in the effort, under the direction of Dr. Niu of the University of Tokyo, recognized the need for a giant helium bag to reduce interactions of beam protons with air in a 200-foot section of beam line. They immediately set out to construct such an item, utilizing their many years of experience in constructing high altitude helium-filled balloons.

However, it was a clever technique devised by members of the NAL Switchyard Section that provided the essential ingredient. They were successful in shaving off just a few thousand protons from the billions of protons in the circulating beam, and sending them on to the Meson Lab. (Too many particles would over-expose the emulsions and make them useless. Radiation Physics Section and Meson Lab personnel had constructed several monitoring devices to assure that beam could be measured and set for this low intensity.) After a frantic day of last minute preparations, it was decided to go ahead with the initial exposures. The first round of stacks were completed by midnight, and with continued coordination with members of the Acceleration Section, those remaining were exposed by 5:45 a.m. on Wednesday morning, just 15 minutes before the end of the available time.

The physicists concerned with the emulsion experiments were: J. Gierula of the Institute of Nuclear Research -- Cracow, Poland; David King of the University of Tennessee; P.K. Malhotra of the Tata Institute of Fundamental Research, Bombay, India; G. Thomas of Ball State University, Muncie, Indiana; R. Kaiser and J. Massue of the Center of Nuclear Research -- Strasbourg, France; S. Ozaki and M. Teranaka of Osaka City University, Japan; K. Kui and T. Ogata of Tokyo University, Japan; Jere Lord of the University of Washington; V. Nikitin of Dubna representing M. Tretyakova of the Lebedev Physical Institute, Moscow, U.S.S.R., and Andreas Van Ginneken of NAL.

Following this success, the members of the Meson Laboratory Section will continue their preparations for the more complex experiments to come. This includes getting ready the 80-ft. long targetting arrangement that allows six secondary particle beams to share the common target struck by the external proton beam from the accelerator. Preparation must be made for operation of the many magnets, collimators, vacuum systems, control systems, etc., of the complex transport systems that carry these particles to experiments placed at various points in the 1,000 ft. long tunnels that house these beam lines. Provision must be made for containment of radiation by a massive overhead covering of soil. Finally, space must be provided for the experimenters' equipment in these beam lines, including electrical power systems, water cooling systems, air conditioning systems, and magnets.

The next experiments scheduled for the Meson operations are a quark search and a neutron total cross section measurement. The quark experiment is a hunt for fractionally-charged "quark" particles by physicists from Yale University and Brookhaven National Laboratory, utilizing the normally neutral M4 "K₀" beam as a charged particle path. The neutron total cross section experiment utilizes the tunnels of the M3 "neutron" neutral beam and involves physicists from the University of Michigan and Wisconsin.

The nucleus of the Meson Lab group is the old Booster group. Among these are Jim Michelassi, Jan Ryk, Umer Patel, Jim Humbert, Leo Ray, Bud Koecher, Frank Ascolese, Dick Nelson and Joyce Arado. Add to this the efforts of Don Richied, Bob Kolar, Bill Lord, Tony Glowacki -- among others -- and you have the fine crew comprising the present-day Meson Laboratory. Staff physicists of the Meson Laboratory in this continuing effort are Dick Lundy, Klaus Pretzl and Alan Wehman. Valuable contributions in the past toward creation of the Meson Lab were made by a host of others, including Jim Sanford, Lincoln Read, Ed Bleser, Dick Orr, Dick Carrigan, Dave Carey, Dave Eartly, and Roland Juhala -- just to single out a heroic few. Groups outside the Section making valuable contributions are the Controls Group under Bob Daniels, the Alignment Group under Bill Testin, and DUSAF represented by Tom Pawlak.

Assisting with the emulsion experiments were Lou Voyvodic (Experiment Coordinator) and Jim Hoover of the Neutrino Lab; Bleser, Gene Fisk, Joe Gomilar, Jack McCarthy, Robert Oberholtzer, Les Oleksiuk, and Claus Rode of the Switchyard Section; Bob Horbis, Leonard Indykiewicz, Randy Ingamells, Kolar, Lundy, Pretzl, Richied, and Dimetrios Zafiroopoulos.

TO THE LABORATORY STAFF:

Dr. Wilson and I would like to express our thanks to all members of the Laboratory staff for your help in making the recent XVI International Conference on High Energy Physics a success. The participants had high praise for our arrangements. These visitors will take their impressions back to their homes all over the world. Thus, beyond a direct contribution to the Laboratory's goals, your efforts will also contribute to international goodwill.

Once again we have met a challenge and met it successfully under rather difficult conditions. Each of us in the Laboratory contributes in some way to these successes, and each contribution is important.

Thanks again.

EDWIN L. GOLDWASSER

September 25, 1972

CENTREX IS COMING

NAL is making preparations to change its present telephone system to "Centrex" on November 3rd. The new system gives direct dialing from the outside to each telephone, by-passing the switchboard. Employees will be asked to mail information about the change to people they deal with.

Training classes will be held and informational bulletins will be issued during October.

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REGISTER NOW TO VOTE IN NOVEMBER

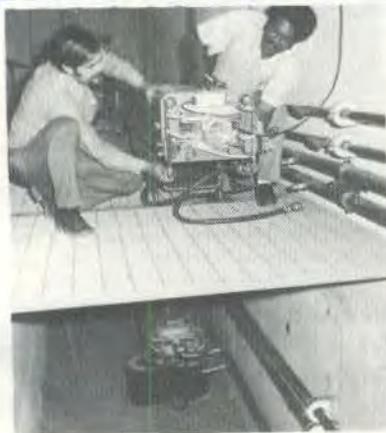
Are you registered to vote in the November elections? Any U.S. citizen over 18 years of age who has resided for thirty days in the precinct where he wishes to register is eligible to vote.

In Cook County, registration closes on October 2nd. Call 321-5672 for further information. In DuPage and Kane counties, you may register until October 9th. A list of registration offices in the main communities of DuPage County is available in the NAL Public Information Office, Ext. 351. In Kane County, call 232-0821 for further information.

Voting by absentee ballot by mail is carried on between October 9th and November 2nd; in person between October 9th and November 4th.

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INSIDE THE NAL MESON LABORATORY...



...Don Richied and John Caffey inspecting a sweeping magnet in the M-3 line. The magnet in the pit is for the M-4 line, 4-feet below the ground level...



...(L to R) R. Lundy, K. Pretzl, R. Kolar, L. Voyvodic at the location of the emulsion experiments...



...Umer Patel (Left) and Frank Ascolese at neutron detector of the neutron total cross section experiment...

(Photos by Tim Fielding)

...Donald R. Getz, NAL Assistant Director, spoke at the September 24th ceremony rededicating the grave of General Thompson Mead in NAL's Pioneer Cemetery. In addition to officials of the Kane County Council of the Veterans of Foreign Wars, other guests included: (seated left to right) Robert Mitchler, Oswego, Senator from the 38th District in the Illinois State Legislature; Clifford Carlson, Geneva, member of Congress from the 15th District, and Miss Ora Mead of Batavia, great grand-daughter of General Mead...



ACADEMY AWARD FILM AT NAL
Friday, September 29th, 8 p.m. - The Village Barn

Critics agree "Closely Watched Trains," winner of the 1967 Academy Awards as "Best Foreign Language Film," deserved all the praise it received. The Czech film deals with the experiences of a 17-year old boy who is a trainee in a provincial railway station during the Nazi occupation of Czechoslovakia, and the rather difficult business of his growing up.

This offering is a "bonus" for those who buy a ticket for the 1972-73 series sponsored by the NAL International Film Society at \$5.00 for six films. Hereafter, single show admission is \$1.00.

The NAL film showings, which offer a selection for every taste have become increasingly popular with NAL employees and visitors, all of whom are welcome to this opening of a new season.

CLASSIFIED ADS

FOR SALE - 1967 Olds F-85, 2/dr., radio, auto/trans. N/8 Eng. Gd/Pwr. \$500. Ralph Wagner, Ext. 324.

FOR SALE - 1963 Falcon Sta. Wag, w/radio/htr/auto-trans. Runs gd., needs battery & muffler. \$20 - Call John Milford, Ext. 461 or 232-9382.

FOR SALE - 1971 Ford Pickup, ½ ton, V8, 3 spd., w/coast mirrors, tool box, heavy duty battery, low mileage. Call Bob Smith, 897-1633 or Susan Smith, NAL/Ext. 467.

FOR SALE - 1965 Mustang/Conv. 289-4/spd. Gd. Cond. \$350. Call Marilyn Petritsch, Ext. 205.

FOR SALE - 1964 Black TR-4 Conv. w/new white top, tires, & muffler. Call R. Clewlow, 945-5262.

FOR SALE or TRADE: Assorted Ford Edsel parts; one curta Calculator; 1 1958 Ford Galaxie; 4 prs. of "McLinoch" Ruffles, Circa 1938, some w/bindings. A-1 excellent. Call R. Crocker, DUSAF, 879-2900, Ext. 220.

LOST & FOUND - 18K y/gold man's wedding band, approx. size 8/9 Call Denise, Farmhouse #66. Ext. 791.

FOR SALE - Stereo, gd/sound but needs work; **WANTED:** Old pillows, any kind, any condition. Call Cathi, Ext. 701.

FOR RENT - Furnished 3/bdrm. house w/one & half bath in N.E. Wheaton from Jan. 15th to July 15, 1973 at \$250 per month. Call S.J. Rothman, 665-1374 or 739-7711, Ext. 3417.

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The Village Crier is published by the Public Information Office of the National Accelerator Laboratory. Margaret M.E. Pearson, Editor. Correspondence may be directed to the address below. Telephone number of the Laboratory is 312-231-6600.

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