

The Village Courier



national accelerator laboratory

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PROGRESS ON ACCELERATOR STUDIES

200 BeV

1:08 P. M. - WEDNESDAY, MARCH 1, 1972

CELEBRATION GALA !!!

SATURDAY, MARCH 11TH, 8:30 P. M.

DETAILS ON BACK PAGE



...Robert R. Wilson, NAL Director, offers a toast at the celebration held in the lobby of the Main Control Room following achievement of 200 BeV acceleration at NAL...



...200 BeV victory in the NAL Main Control Room. Front row, seated (L to R), Francis T. Cole, Jeff Gannon, John Clarke. Standing (L to R) Dick Cassel, Ryuji Yamada, Bruce Strauss, Paul Evan, Will Hanson...

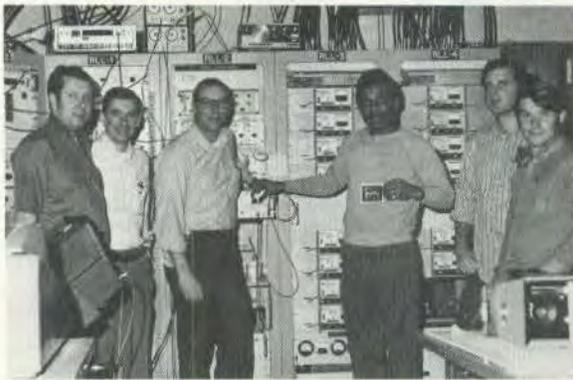
NAL ACCELERATOR REACHES DESIGN ENERGY

At 1:08 p.m. on Wednesday, March 1, employees of the National Accelerator Laboratory opened the doors to a new era of man's understanding of the world in which he lives when the NAL accelerator system accelerated a beam of hydrogen protons to the design energy of 200 billion electron volts (BeV). Soon, scientists from all over the world will use the beam to conduct a variety of experiments that will yield new knowledge of the characteristics and interactions of the particles of the atom. The secrets they uncover will describe the "world of the small" with understanding that has been impossible without the NAL machine. Now, protons generated from hydrogen gas in a pre-accelerator will move in succession at increasing energy and intensity, through the linear accelerator, the booster synchrotron and finally into the Main Ring where they will travel around the 4-mile ring 70,000 times in 1.6 seconds receiving a 2.9 million electron volt boost of energy on each revolution until they attain an energy of 200 billion electron volts. And scientists using the machine will accept the challenge to explore the unknowns of the 1970's.

The event touched off an all-Laboratory celebration, representing successful achievement of goals set years ago in which every employee without exception has been in some way involved.

The 200 BeV level was one of a series of milestones since January 1, 1972 that saw

(Continued on Page 2)



...Victory in R.F. Bldg. (L to R) Stan Tawzer, Lin Winter-
owd, Jim Griffin, K.C. Cahill, John Reid, Allan Fogle...



...Donald E. Young, Accel. Section, & James R. Sanford,
Assoc. Dir. for Program Plan., at the oscilloscope...



...At the Booster console, (L to R) Ed Hubbard, Keith
Meisner, Gerry Ortlieb...



...R.R. Wilson, Paul Reardon, Dir. of Bus. Admin., Edwin
L. Goldwasser, Deputy Director, wearing post BeV smiles...

acceleration rise from 20 BeV on January 22nd to 53 BeV on February 4th and to 100 BeV on February 11th. After reaching 100 BeV, a readjustment of 26 power supplies in the Main Ring enabled the machine to climb to 200 BeV. The delicate tuning, the horrendous assignment of getting the hundreds, the thousands of component parts of the huge machine to synchronize in absolute precision brought many moments of great frustration in the last days of February. The effort was typified by events on the afternoon and evening of February 29th when, after easily reaching 55 BeV, further progress was delayed for more than 12 hours because of magnet problems.

On the morning of March 1, at 9:30 a.m., Robert R. Wilson, Laboratory Director, reported to employees on his testimony the previous day before the Joint Committee on Atomic Energy in Washington, D. C., the first of two days of hearings on budgets of high energy physics projects in the U. S. financed by the federal government. He expressed disappointment that he had not been able to report achievement of 200 BeV to the congressmen. Physicist Ernest Malamud reported to the group on the substantial progress made on the accelerator since reaching 100 BeV. Both men explained that although things were going very well, the elusive 200 was lurking just beyond the collective NAL fingertips. Dr. Wilson closed the meeting urging staff members to get the news the Joint Committee wanted. Within a few hours he was able to report to Washington that the accelerator had in fact reached its design level of acceleration.

After correcting the problems with the magnets early on the morning of March 1, the operations crew in the Main Control Room, with physicist Francis T. Cole as chief, went into action about 8:30 a.m. Jim Griffin, physicist, stationed in the R.F. Building, some six blocks away, turned on all R.F. stations. The inter-com dialogue between Cole and Griffin began. The correction in the relation of the rate of rise of current between the bending and the quadrupole magnets had been put into effect on the previous night shift by physicists Donald and Helen Edwards, who felt that this might have accounted for the beam instability after 30 BeV that had been encountered in the few days previously. Cole, Griffin, and other members of the crew spent the morning tuning and adjusting the machine to compensate for the most recent alterations.

At 11:00 a steady, stable beam was achieved. By 11:30 beam had passed transition energy (17.4 BeV). According to Ed Gray, synchrotron physicist on duty at the main control console, from then on things just got better and better. A slight jolt to the system -- a "quad bump" -- gave the beam further intensity. At 12:30 p.m. the beam reached 167 BeV for the first time. More and more people clustered around the screen in the Control Room lobby, watching the narrow band that typifies the beam as it crept slowly to the right to match the triangular peak representing 200 billion electron volts of energy. By 1:00 the screen was completely hidden by a crowd of forty or more people. The ding-ding-ding of a bell signalled the coming of the 200 BeV pulse in the bi-modal ramp.

At the R.F. building, Jim Griffin recalls, all controls were in ideal positions, but the noise of the gathering crowd in the Control Room drowned out the warning bell on the inter-com; his adjustments had to be cautious. Stan Tawzer, working with Griffin, watched the screen. At 1:03, Tawzer noted, "That one went all the way out," but they waited for the next pulse to be sure.

In the Control Room on the next pulse, someone in the hushed crowd said, "There it is!" and a rousing cheer filled the room, at 1:08 p.m.!

On a desk in the lobby sat a carton with a white handwritten label reading, "For Ned Goldwasser...for 200 GeV celebration...from Al W...It's the correct brand. Tradition calls for 40 persons per bottle at lower energy machines...". Edwin L. Goldwasser, Deputy Director of the Laboratory, ordered the carton opened. The gift of chianti wine came a few days before from Al Wattenburg, professor of physics at the University of Illinois, who was one of the small group present at the first self-sustaining nuclear chain reaction achieved in 1942 by the team headed by Enrico Fermi, when a bottle of the same brand of chianti was passed among that group of pioneer nuclear scientists. Now, thirty years later, another group of jubilant scientists shared a major achievement in particle physics. Dr. Wilson and Dr. Goldwasser passed through the crowd filling paper cups, shaking hands, accepting and extending congratulations at every turn. Later, champagne that had waited for many months in the cafeteria cooler, was served in plastic goblets labelled "200 GeV".

The entire Laboratory joined the gala celebration. That evening the night crew held their own celebration. Everywhere it was recognized as a "team" victory. Each person on site could rightfully feel he had contributed. Since breaking of ground for the linear accelerator on December 1, 1968, all efforts have been bent over the 200 BeV goal. The interim happenings -- the linac 200 MeV beam on December 1, 1970; the booster 8 BeV beam on May 20, 1971; the first Main Ring beam on June 30, 1971 -- all have been but stepping stones on the way to the present achievement.

The Main Ring will shut down for a short period beginning March 11th to install the water cooling system that will enable the machine to run regularly at 200 BeV and probably higher levels. The decisions to go to higher levels will depend somewhat on the results achieved at the 200 level.

The next major achievement of the staff will be the extraction of beam from the Main Ring to the experimental areas. This highly technical effort will be headed by physicist Edward Blesser. The first experimental area to receive beam will be the 30-inch Bubble Chamber group. Meanwhile, Experiment 36 is underway in the Main Ring vacuum chamber, jointly involving experimenters from NAL, Rockefeller University, The University of Rochester, and the Institute for Nuclear Research in Dubna.



...Dr. Wilson (R) shaking hands with fellow employees. Dr. Goldwasser (ctr.), Harry Howe, Safety Off. (plaid shirt)...



...Dr. Wilson pouring chianti for Shigeki Mori...



...Dr. Goldwasser, Dr. Wilson, and Priscilla Duffield at the informal celebration...



Autographs for all (L-R) T. Glowacki, Goldwasser, D. Sutter, K.C. Cahill, Wilson, F. Schulze, H. Satter, G. Moore...

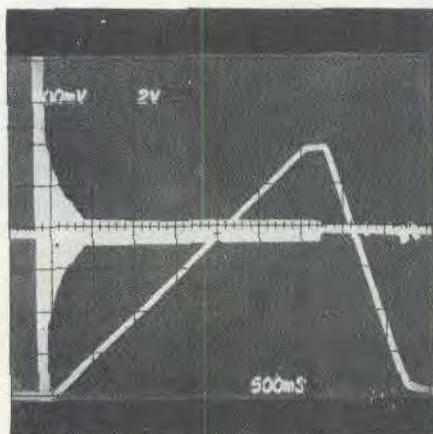
200 BeV CELEBRATION

Universities Research Association, Inc., is hosting a gala semi-formal party on Saturday, March 11, 1972 at 8:30 p.m., in celebration of the accelerator reaching 200 BeV. All employees of NAL, AEC, DUSAF, and visiting scientists, and their spouses or dates are cordially invited to attend this happy occasion.

There will be two dance bands, continuous food service, champagne fountains as well as beer and soft drinks. There will be a lounge for those who like to sing-along and a fascinating display of photographs depicting "life at the Lab" - including those exciting 200 BeV Day pictures.

Guests are asked to park in the Linac Parking lot -- there will be guards to assist -- and to enter through the Linac Building where signs will point the way to the activity. Coat racks will be located in the Cross Gallery but the action will be confined to the new High-rise Building.

Committee members are Dick Carrigan, Sal Cuomo, Don Getz, Jim Hogan, Bernie Lensmeyer, Frank Kleber, Bob Kolar, Ernie Malamud, Chuck Marofske, Jerry Ortlieb, Don Richied, Barb Schluchter, Jim Schluchter, Helen Severance, and Don Young.



.....Those who operate the NAL accelerator do so by observing several displays similar to small TV screens on which data of one kind or another indicates the status of operation. The adjustments they make at the main control console alter in one way and another the images that appear on the screens. The presence and characteristics of a beam in the Main Ring are seen in the picture at left. The sloping line indicates the "magnet ramp"--a pre-set pattern that allows the machine to reach a certain level of acceleration, in this case, 200 billion electron volts which is represented by the peak of the triangle. The beam is depicted by the band at the center which moves from left to right as it accelerates to higher energies. When the beam band extends to the same vertical line as the top of the triangle, it has accelerated out to the design energy. The picture, also referred to as a "scope trace," shows the conditions on the first pulse where the beam has reached the peak of a 200 BeV ramp...

All photos in this issue by NAL Photography----Tony Frello, Tim Fielding.

CLASSIFIED ADS

- FOR SALE-AIWA cassette tape rec., port. lightweight unit, very good cond. \$45. Ron, 879-2900, Surveys.
- FOR SALE-Concord 884, 4 track stereo (reel), transistorized, very good cond., \$150 or best offer. Call 325-3957 (between 4 & 9 p.m.)
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- FOR SALE-Glen Ellyn, 3 bdrm., Bi-level, new shag cptg., fam. room, across from grade school. Low 30's. 469-1964.
- FOR SALE-4 yr. old Zenith, 23" black & white TV. Good cond. \$60. Betty, Ext. 470.
- FOR SALE-Spinet, Wurlitzer piano, used, good cond. \$1,350. Call Sue, Ext. 479.
- FOR SALE-1958 Chev. \$75. Good running cond. Needs some body work. F. Guinchard, Ext. 734.
- WANTED-20" used apt. range. Marty, Ext. 595 or 969-0015.
- WANTED-women interested in playing softball this summer in Aurora. Contact Sherry Nila, Ext. 470. Beginners & stars welcomed!

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