

# The Village Courier



fermi national accelerator laboratory

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## MESON LABORATORY BEAM GOES TO 350 BeV



...Meson Lab's crews finish M-1 changes: (Standing, L-R) T. Glowacki, B. Shafer, T. Turner, G. Lawrence, D. Byrd, R. Frega, J. Ryk, J. Caffey, D. Worland, L. Indykiewicz, D. Miller, A. Andreasen, T. Topolski: (kneeling) S. Ecklund, A. Ohlin, B. Kaczermak, S. McGuire...

Working frantically during last September's shutdown, the Meson Laboratory crews made major modifications on the M-1 beam in the Meson Area. The changes permit experiments on the M-1 line to use 350 BeV beam for the first time. The previous limit was 280 BeV; future modifications are planned to reach further, to 400 BeV.

The ten days of shutdown work were crammed with activities in the Meson Area, including the installation of new magnets, connecting bus work, cooling water and interlocks, and carrying out the many checks to be sure magnet polarities were set properly. The effort was so well coordinated that M-1 was the first of the beams in the Meson Area to come on after the shutdown.

During the past weekend, the M-1 beam was run at 350 BeV bringing it to the Detector Building. A series of tests demonstrated the flux of the new line, paving the way for future use by Experiment #104, a second generation total cross section experiment which in 1974 began to see a rise in the cross section for charged pions and Kaons as well as protons. The exact nature of the rise will be better understood with new data at higher energy.

Stan Ecklund, Liaison Physicist, designed the upgraded beam for the Meson Department. Tony Glowacki, Meson's Engineer on M-1; the alignment crew of Research Services; Jan Ryk overseeing much of the bus work installation; Dick Worland and Bud Koecher and their crews of technicians; John Stoffel, electrical engineer; Bill Lord and the operations crew, and a number of other technicians and contract workers at Fermilab have all participated in the M-1 improvements.

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## MESON BEAM TO 350 BeV (Continued)

Most of the beams in the Meson Area are so-called "secondary particle" beams. That is, protons from the accelerator clash with the target located  $\frac{1}{4}$  mile upstream from the Meson Detector Building. Most of the particles coming off the target are moving slower than the original protons, so that they are headed toward the experiments at somewhat lower energy than the inbound protons from the accelerator. But as the Meson Area has developed, many clever innovations have been invented that permitted it to work at higher and higher energies as the accelerator moved up in energy. These include modifications to the beam line from the accelerator to the Meson Area to upgrade it to 400 BeV and then successive modifications on the beam lines themselves -- such as on M-1 and M-2 -- to pack in more components. Since the Meson Area was tightly tailored to 200 BeV, these modifications have required some of the fanciest footwork in upgrading equipment that has been seen at the Laboratory.

M-1 is typical of several charged particle beams around the Laboratory. It is a powerful beam capable of putting out something like three to ten million particles per pulse of the accelerator. A whole variety of particles are available from the beam -- a wide variety of mesons, including both signs of pi and K's and also protons and anti-protons, and electrons and positrons at a somewhat lower intensity.

The M-1 beam extends an incredible fourteen hundred feet, or  $\frac{1}{4}$  mile, from a tiny beryllium production target, eight inches long and the thickness of a welding rod, out to where the experiments stream out several hundred feet beyond the beam. In some ways, a charged particle beam is similar to a microscope or telescope. Quadrupole magnets are equivalent to the lenses in a telescope. Other bending magnets act like prisms, breaking and bending the beam into different momenta or energies just as a prism divides a beam of white light into many colors.

Other parts of the beam have no optical analogy. M-1 includes special Cerenkov counters that can be used to distinguish the many different charged particles coming down the beam. Two of these, each 50 feet long, can be bolted together to make one counter a hundred feet long. In addition, there are scintillation counters which measure beam intensity and profile monitors provided by the Research Services group which give a picture of beam position.

"With these increases in energy capability the Meson Lab retains its unique position in the Laboratory providing high energy pi and K mesons, anti-protons and neutrons for experimenters. This is especially important as experimenters investigate the difference between mesons and protons for producing anticipated charmed particles and for understanding strong interactions," Stan Ecklund comments.

Moving the M-1 beam and Meson Laboratory up to 400 BeV is already an incredible achievement. Planners at the Meson Laboratory have been considering an even more ambitious future. Lincoln Read, Chuck Brown, and Alan Wehmann have reviewed the possibilities for bringing 1000 BeV to the Meson Lab when the Energy Doubler/Saver comes on. Use of the superconducting technology that is developing now around the Laboratory for many purposes, including the Doubler/Saver, should make it possible to do this.



*...Front End Hall of the Meson Lab showing components of the six beam lines fanning out from target...*

## CARRIGAN MOVES TO NEW POST

As of November 1 Dick Carrigan will move into the Directorate with a six month appointment as Acting Assistant Director. He will bring with him the responsibilities for the Laboratory's professional personnel and also for a number of his former activities which directly involve the Directorate.

Chuck Marofske has been appointed as Acting Director of Personnel Services and in that capacity will assume Dick Carrigan's other responsibilities within the Administrative Division.

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## LIBRARY SHORTENS LOAN PERIOD FOR BOOKS

The circulation period of books from the Fermilab Library will now be reduced to one week, Roger Thompson announces. The change is made on the advice of the Library Committee, chaired by Frank Cole, following a suggestion by the Users Executive Committee, aimed at increasing the availability of books for users of the Library. The Library also plans to work to reduce the number of overdue books. Library patrons' cooperation will be greatly appreciated.

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## McC. ADAMS LECTURE NOVEMBER 5

Holders of tickets for the Robert McC. Adams lecture on Friday, November 5 who cannot use the tickets are urged to turn in the tickets or cancel their reservations so that the waiting list can be accommodated. The fifth in the Bicentennial Lecture Series, Adams will speak on "Cities in the Sand," describing his archeological digs in the Mideast. For further information, contact the Guest Office, Ext. 3440.

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## SIGMA XI MEETING NOVEMBER 9

The second meeting of the newly-organized local chapter of Sigma Xi will be held at Wheaton College on Tuesday, November 9. Dr. Elving Anderson of the University of Minnesota will speak on "Genetic Control and Human Value." Everyone is invited; Sigma Xi meetings are open to the public. Dinner reservations at \$6.50 (cornish game hen) may be made by calling the Fermilab Public Information Office, Ext. 3351, before November 2. For further information about Sigma Xi activities contact Dixon Bogert, Ext. 4015.

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*...Carl Sagan, astrophysicist from Cornell University, author of "The Cosmic Connection" and a member of the Viking team conducting the Mars exploration, visited Fermilab last week. He spoke at the fourth Bicentennial Lecture to a full house of Fermilab people and surrounding community residents. His slides of photos taken by the Mars mission and his 90-minute talk about the problems and discoveries of the Mars voyage held his audience spellbound.*

*"The spectacular scenery we see on Mars gives me a remarkable tug to walk right into the pictures," he said. "Our results are astonishing, positive. Clearly we have found something interesting there."*



## CHARITY DEDUCTIONS AVAILABLE TO EMPLOYEES

Through November, Fermilab will again offer employees the convenience of signing up for payroll deductions for charitable contributions. Employees may contribute to one, two, or three charities of their choice. A pledge form will be distributed Friday, October 29. The form is printed in duplicate, the original to be returned to the Payroll Department, the copy retained by the employee. The last day to return the form to Payroll is November 29, 1976. Contributions must total at least \$12.00 per year to be included in the payroll deduction plan. The contributions will be deducted starting January 1, 1977, and the Laboratory will forward contributions to the designated charities. No records by administrative organization will be compiled.

Each employee has a choice of giving to any charity that is recognized by the Internal Revenue Service. All contributions are tax deductible when given on a voluntary basis. Fermilab's payroll deduction plan recognizes that charity contributions are often closely related to one's place of residence. The Laboratory assists employees by providing the mechanism for spreading deductions over the calendar year.

For further information on any aspect of Fermilab's charity payroll deduction plan, call Personnel, Ext. 3324.

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A NOTE OF THANKS, from Bess Miller and family: "We wish to thank the employees at Fermilab for the beautiful floral offerings and kindness shown to us in our recent loss of our beloved husband and father, Donald J. Miller. Words cannot express our appreciation, so thank you for being such great employers and friends."

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CYCLISTS, NOTE: There are now three pads for motor bikes around the Central Laboratory: At the east and at the west side of the building (adjacent to the stairs leading to the north entrance) and, just completed, the third, at the west entrance to the Cross Gallery Control Room.

	HALLOWEEN DANCE	
	Sponsored by Fermilab Music Club	
No admission charge	DJ and records	Cash bar
	<u>Prize for the Best Costume</u>	
Kuhn Barn	Saturday, October 30, 1976	9 p.m. to 1:00 a.m.

## CLASSIFIED ADS

ATTENTION - Tim Toohig, S.J., will offer Mass at 12 noon on the Feast of All Saints, Monday, November 1, 1976 at the Cenacle Retreat House, Batavia Rd., Warrenville. All Fermilab employees, experimenters and visitors are invited to participate. Any questions, call Elsie at Ext. 3674.

WANTED - Used Grumman canoe, 17' or 18'. George Luste, Ext. 3888. (Please leave message.)

FOR SALE - Conn alto sax; Schwinn girl's bike, \$15; bunk beds, \$20. Call Barb, X3795 or 232-8024 eves. WANTED - 10-speed bike. Call Barb, Ext. 3795.

FOR SALE - Land in Colorado, 16.9 tree covered acres, stream, road access, county maintained. Near Ft. Garland, \$19,500. H. Abarbanel, Ext. 3751 or 357-1699.

FOR SALE - 1968 Chev. 4 dr. Caprice H.T., AC, P/S/B, W/W, + 2 snow tires (on wheels). Call Ed Brezina, Ext. 3580 or 323-0794.

FOR SALE - Ski boots, Caber, size 8, \$25. WANTED - ski boots, size 11 (how's that for one year's growth?). Call Marv Warner, Ext. 4430.

WANTED - Airplane partner for 1/2 of a 1962 Beach-Musketeer. 1600 TT, 300 SMOH, KX150, MK-16. Randal Ruchti, Ext. 3256/4146 or 355-4971.