

SUMMARY OF THE VERTEX DETECTION WORKSHOP
September 21-22, 1984

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One of the ideas to come out of the Fermilab Fixed Target Workshop (June 9, 1984) was that there be a series of workshops on the role of Tevatron II experiments in heavy quark physics. The idea was re-iterated by the Physics Advisory Committee in its June 1984 meeting. Such a series would examine the physics opportunities, the experimental techniques and problems, and the strengths and weaknesses of fixed-target experiments as compared to e^+e^- experiments.

The first of these workshops, on vertex detectors, was held at Fermilab on September 21 and 22, 1984. The meeting was originally conceived of as an intimate workshop, but generated such interest that it quickly blossomed into a short conference attended by approximately two hundred people.

Friday morning was devoted to silicon strip detectors and their associated readout electronics. Gerhard Lutz's (Max Planck Institute-Munich) overview of the state-of-the-art was followed by a description of an on-going program at Stanford of custom IC design and fabrication. In addition, Steve Shapiro (SLAC) presented a novel idea for a silicon pad detector. Five talks were then given on working experience with specific silicon strip detectors and strategies for their best use.

On Friday afternoon, the general heading could have been "optical detectors" and an extremely wide range of devices was presented. Both LEBC, which has produced a large fraction of the existing data on hadronically-produced charm using a small fiducial volume and conventional optics, and the much larger holographic bubble chambers to be used at the Tevatron were discussed. Progress was reported on the development of high resolution streamer chambers which would combine the pattern recognition advantages of optical detectors with the triggerability of the electronic detectors. The last talks of the afternoon described scintillating optical fibers, which might be used in an active target or in miniature "wire" chambers.

On Saturday, Stan Majewski (Fermilab) presented a review of some of the ideas being pursued to increase the resolution of drift chambers (such as the use of "cool" gases in which drifting electrons suffer very little diffusion). His talk was followed by three others describing specific projects, two of which were

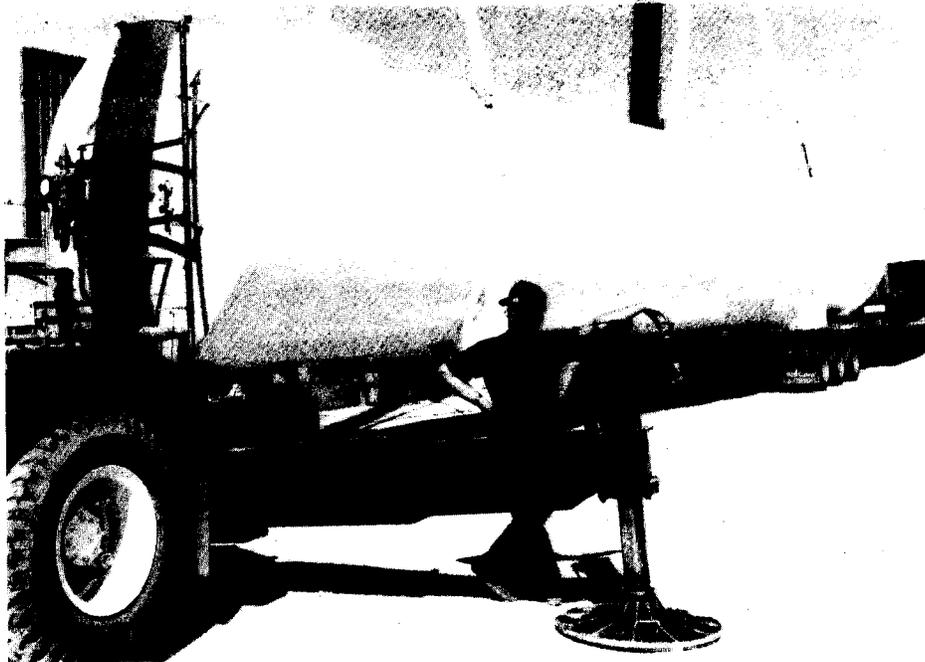
added to the agenda at the last minute. There was great interest expressed in the subject of high resolution wire chambers and this section of the conference could easily have taken much more time than was allotted to it.

The focus of the talks then shifted back to solid-state detectors. Pavel Rehak (Brookhaven National Laboratory) and Lutz presented data on impressive first results obtained with silicon drift devices. Muzaffer Atac's (Fermilab) presentation of results obtained by Taka Kondo (KEK) et al. on radiation damage to solid-state devices provoked a lively discussion of the prospects for improving device lifetimes and the extent to which these problems have already been solved by military suppliers.

Finally, David Buchholz (Northwestern University) reviewed some of the pattern recognition problems which were faced by NA11 in their analysis of charm production. This talk had originally been planned as an introduction to a discussion of pattern recognition and the integration of vertex detectors into spectrometers. However, there was not enough time to cover this part of the agenda. This discussion will hopefully become part of another workshop.

The attendance and the enthusiastic discussions at the workshop certainly demonstrated a lively interest in vertex detectors for charm and beauty experiments. The wealth of ideas presented should provide useful input both to the rest of the workshops and to plans for the next generation of heavy quark experiments. A limited number of copies of a volume containing sets of the transparencies from the workshop will be available from the Users Office at Fermilab.

Plans are underway for the next workshop, "Physics Topics: Charm and Beauty II," to be held in the next few months.



A new 20,000 liter liquid nitrogen dewar is delivered to the Central Helium Liquefier. (Photograph by Fermilab Photo Unit)

REORGANIZATION

Since the primary goal of Fermilab is now to exploit TeV I and II and their associated detectors for physics, Director Leon Lederman announced a reorganization, effective October 1, to strengthen the Laboratory for this new period.

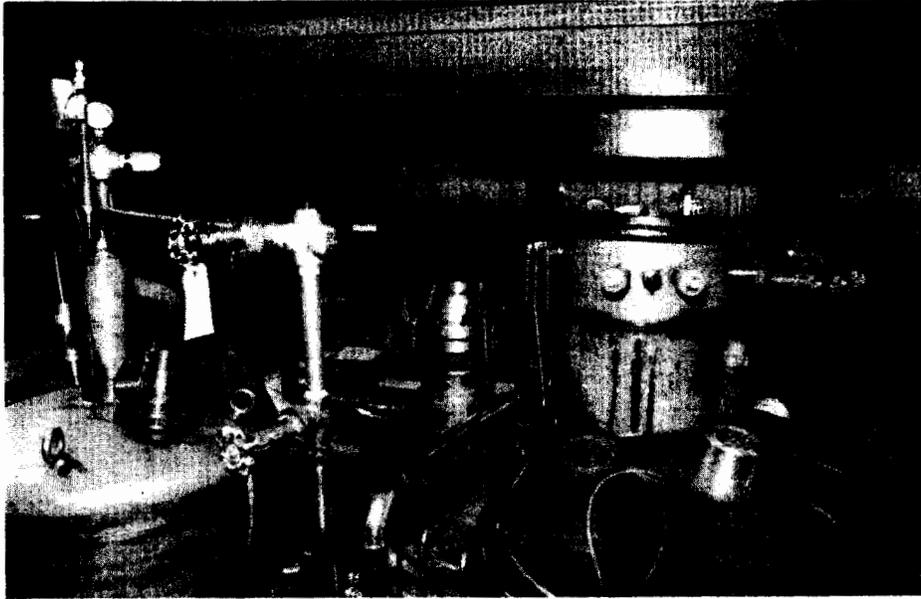
Three new Associate Directors have been named: James (Bj) Bjorken for Physics, Bruce Chrisman for Administration, and Dick Lundy for Technology. Phil Livdahl will continue to serve as Acting Deputy Director but will devote much of his time to technical problems in the Accelerator Division.

Peter Koehler, formerly head of the Research Division, will join the Accelerator Division as Associate Division Head, responsible for providing support for the D0 project and the other (non-CDF) Main-Ring tunnel experiments in that division. Ken Stanfield, formerly Head of the Business Office, will take Koehler's place as Head of the Research Division. Jim Finks has been appointed Business Manager.

Tom Kirk will succeed Drasko Jovanovic as Head of the Physics Department, in addition to continuing as Manager of the TeV II project. Kirk's Deputy Head will be Dan Green.

Paul Mantsch will replace Dick Lundy as the head of the Technical Support section. Mantsch has been concentrating recently on the design of prototype magnets for the Superconducting Super Collider (SSC). In his new role, he will have responsibility for all conventional magnet work, drafting service, the machine shop, and magnetic measurements as well. Gene Fisk will head the continuing SSC magnet work.





Experiment 636 dewars.
(Photograph by Fermilab Photo Unit)