1984 FERMILAB ACCELERATOR SUMMER SCHOOL

Frank Turkot

Fermilab once again hosted the U.S. Summer School on High Energy Particle Accelerators during the two-week period from August 13-24. It was the fourth in an annual series of schools on accelerator science that was initiated at Fermilab in 1981. Melvin Month of Brookhaven National Laboratory and Frank Turkot of Fermilab organized this year's School. Stimulated in part by the recent discussions of the Superconducting Super Collider (SSC), school attendance was 225, a 50% increase over the 1981 school.

The central theme of this year's school was the conceptual design of large accelerators utilizing colliding beams to achieve particle collision energies 1000 times larger than that available with current fixed-target experiments using the Tevatron beam. Nearly two-thirds of the lectures were devoted to collider accelerators and related topics.

In a special symposium entitled "Accelerators for the 1990's" on Monday, August 20, three proposals to achieve these ultra-high energies were presented. Boyce McDaniel of Cornell University reviewed the SSC, the U.S. proposal for a 20-mile diameter circular accelerator colliding protons on protons, and Roy Billinge of CERN presented a design study of a similar machine (Large Hadron Collider, LHC) to be placed in the 6-mile diameter LEP tunnel now under construction at CERN. Burt Richter of SLAC outlined an alternative proposal to achieve the same result with electron-positron collisions using a 30-mile long linear accelerator. A study completed in June estimated the construction cost of an SSC to be approximately three billion dollars.

The 1990's Symposium was followed by an evening round-table discussion addressing the subject, "The World-Wide Growth of High Energy Physics--Competition or Collaboration?" The speakers above were joined by Martinus Veltman, University of Michigan, Stan Wojcicki, Stanford University, and Leon Lederman. In the lively exchange that ensued, it was argued that (a) the costs of the new machines rule out the duplication of accelerator facilities that has occurred in the past; (b) the construction of the SSC and LHC would be a duplication of facilities; (c) the interested governments are encouraging an international collaboration as a means to reduce the financial burden to any individual country; (d) at present there is no mechanism to build a world-wide consensus; (e) there do exist many examples of international collaboration on R&D for accelerator components and detectors.

A second symposium on "Accelerators of the 1980's" held on Thursday, August 23, reviewed the status and time schedules for the five new high-energy accelerators under construction in the western world. All five are colliders; they include TeV I at Fermilab (completion in 1986), SLC at SLAC (1986), TRISTAN at KEK Laboratory in Japan (1986), LEP at CERN (1988), and HERA at DESY in Germany (1990). Recent experimental discoveries and advances in particle theory lead to great expectations from these new facilities.

All told, there were 63 lectures delivered at the school by 51 lecturers, who represented a broad crosss section of leading researchers from high-energy laboratories and universities around the world. Twelve Fermilab staff were among this group. Many of the students commented on the uniformly high quality of the lectures and the informative site tour which included the accelerator, magnet production facilities, and the B0 detector complex.

Summer School organizers (left) Frank Turkot and Mel Month.
(Photograph by Fermilab Photo Unit)

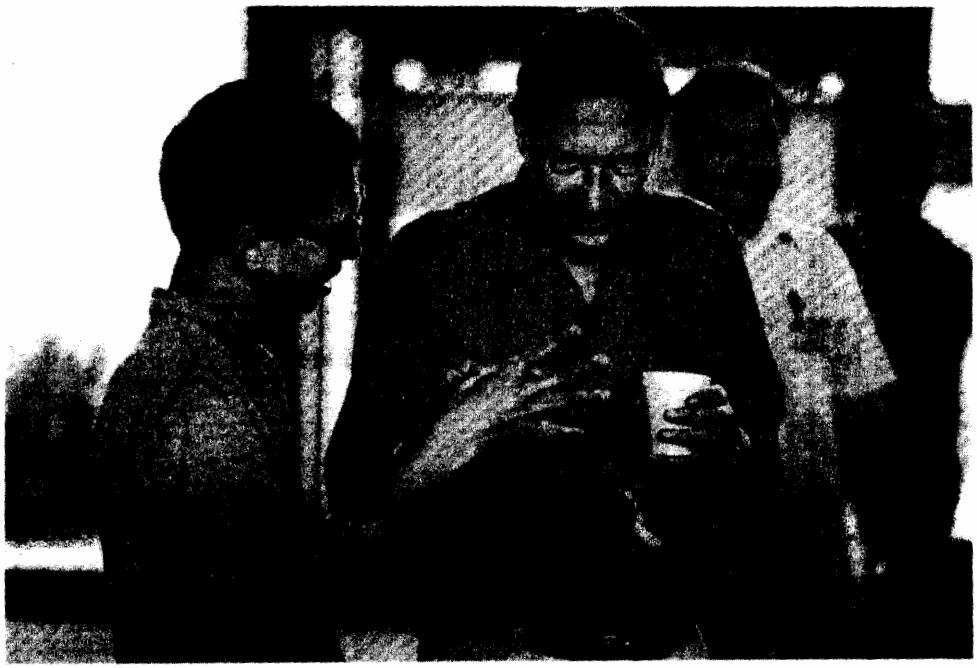
Roy Billinge, CERN, addresses the summer school on the design and operation of the $Sp\bar{p}S$ Collider.
(Photograph by Fermilab Photo Unit)

Round Table Committee members (left to right) Roy Billinge, CERN; Burton Richter, SLAC; Stanley Wojcicki, SLAC; Leon Lederman, Fermilab; Boyce McDaniel, Cornell, and Martinus Veltman, University of Michigan.
(Photograph by Fermilab Photo Unit)

Richard Lundy, Fermilab, illustrates the scale of the LEP collider during his lecture.

(Photograph by Fermilab Photo Unit)

Ian Hinchliffe, LBL, discusses exotic collisions.
(Photograph by Fermilab Photo Unit)



Bill Ng of Fermilab talking with Simon van der Meer of CERN at a break in the accelerator school. Bill Cooper of Fermilab is in the background.

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