

Forward

The \bar{p} 2000 Workshop was held at the Illinois Institute of Technology Center for Accelerator and Particle Physics on August 3–5, 2000. The Workshop was organized by D. M. Kaplan and H. A. Rubin of IIT and K. Seth of Northwestern University. It was attended by about 40 participants. The purpose of the Workshop was to consider two main questions:

1. What will be Fermilab's capabilities for \bar{p} physics in the near- and intermediate-term future?
2. Can a strong physics program be identified to take advantage of these capabilities?

As background, several talks were delivered that summarized the current state of \bar{p} physics, as well as other topics that might be investigated using \bar{p} beams or trapped \bar{p} 's. To begin the Workshop, D. Chang (NTHU) and G. Valencia (ISU) discussed recent developments in the theory of hyperon decays and hyperon CP violation. These talks were followed by summaries of the experimental situation in these areas by E. Swallow (Elmhurst) and D. Hertzog (Illinois at Urbana-Champaign), the latter talk concentrating on PS185 at LEAR, which looked for CP violation by studying hyperons and antihyperons produced symmetrically in the reaction $\bar{p}p \rightarrow \bar{\Lambda}\Lambda$.

In the next session, devoted to resonance studies (including charmonium), K. Seth (Northwestern) surveyed the current situation for antiproton physics in the charmonium region, U. Wiedner (Uppsala) discussed light-quark spectroscopy, and P. Page (Los Alamos) summarized predictions and search strategies for multi-GeV gluonic mesons.

The first day of the Workshop concluded with a session devoted to efforts to develop new \bar{p} facilities. W. Henning (GSI) discussed a new high-energy $\bar{p}p$ facility proposed at GSI. Then G. Jackson (Fermilab) brought us up to date on developments related to the construction of a possible new \bar{p} storage ring at Fermilab, including a most interesting and provocative description of a design concept for a ring that might be at least partially financed by NASA and private industry to produce trapped antiprotons for studies of spaceship propulsion, short-lived medical isotope production, and the direct use of antiprotons for cancer therapy. (Jackson has since conducted experiments in which protons have been decelerated in the Main Injector to an energy close to that which might be appropriate for such a ring, demonstrating the feasibility of a key part of his scheme.) W. Chou (Fermilab) then reported on the proposed new Proton Driver facility at Fermilab, designed to increase substantially the available beam intensity.

The second day of the Workshop opened with a session devoted to potential uses of ultralow-energy antiprotons. M. Holzscheiter (Los Alamos) described the current status of the antiproton decelerator at CERN, and went on to discuss several possible experiments that might be done at a higher-intensity facility like that proposed for Fermilab. Then T. Phillips (Duke) discussed the potential for a unique and fundamental measurement of the effect of gravity on antimatter using an interferometric technique.

The remainder of the second day was devoted to working groups that formed around the topics of

1. CP violation and hyperon beta decay,
2. very-low-energy physics,
3. higher-energy studies of $c\bar{c}$, nuclear physics, and light-quark hadron spectroscopy, and
4. machine and target design and cost.

The final sessions of the Workshop were devoted to summaries of the working group discussions, including a contributed talk by D. Bugg (Rutherford) on using $\bar{p}p$ to study s -channel resonances. The participants were enthusiastic about the prospects of a new antiproton program at Fermilab. It was clear that now is the time for workers in the field to offer input to the Fermilab management if such a facility is to have the flexibility to serve the various user constituencies.

Howard Rubin and Dan Kaplan
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