

routine 650 MeV studies, the radiatively polarized electron and positron beam currents were 5 mA. Ten runs were made, with free precession lasting 0.1 s (3×10^6 spin revolutions). The number of spin turns could not be increased any further due to the polarization smearing, relatively rapid during spin precession in the horizontal plane.

From the measured phase difference, the magnetic moments of electrons and positrons were found to be the same to within one part in a hundred million. Check measurements using an electric field to deliberately separate the electron and positron beam spin precession frequencies underlined the sensitivity of the method.

Beyond 2000

With several major schemes for future hadron and electron-positron colliders being mooted around the world, particle physicists are eager to coordinate their activities to optimize the inevitably lengthy development work for these new machines. (See, for example, the report of the recent 'Future Perspectives' meeting organized by ICFA – the International Committee for Future Accelerators – in the December 1987 issue, page 1).

These machines would provide the research arena towards the turn of the century, but last year a meeting of bold physicists in Erice, Sicily, attempted to look even further into the future. The workshop provided a scientific forum for new avenues in very high energy hadronic physics, with special emphasis on the European scene.



Looking far into the future – Antonino Zichichi at last year's INFN Eloisatron workshop, flanked (left) by Luigi Granelli, then Italian Minister for Science, and Ahmed Ali.

The physics talks assessed the current status of the field, and looked forward to what could be expected from future colliders, as judged by insights from ongoing experiments and by theoretical ideas. A series of illuminating talks looked at the physics possibilities and the attendant technological requirements using multi-TeV (thousands of GeV) proton beams.

Reviewing the HERA electron-proton collider now under construction at the German DESY Laboratory in Hamburg, DESY Director Volker Soergel pointed out that the machine will be able to supply proton beams at up to 1 TeV.

CERN Director General Herwig Schopper stressed the need for world-wide collaboration to avoid costly duplication of resources, and submitted that tenfold increases in hadron collision energy (such as CERN's step from the Intersecting Storage Rings to the proton-anti-

proton collider at the SPS) are a good way of tackling new research ground.

The LHC Large Hadron Collider idea to install a proton-proton collider in the tunnel now being completed at CERN for the LEP electron-positron collider would provide just such an energy increase, pointed out Schopper (LHC's high field superconducting magnets are aimed at around 8 TeV proton beams, compared with the 1 TeV beams now available from the Fermilab Tevatron). The US SSC Superconducting Supercollider project to provide 20 TeV colliding proton beams involves a 20-fold energy increase – 'a large jump into unknown territory', according to Schopper.

Continuing with this rule of thumb, the following generation machine should pitch for 100 TeV beams. Such an idea – the Eloisatron – has been groomed by Anto-