

Toward a TeV Linear Collider. . .

**Two large R&D facilities
at KEK and SLAC are
testing major subsystems
for a next-generation
electron-positron
linear collider.**

The JLC Accelerator Test Facility
SEIGI IWATA

The NLC Test Accelerator
THEODORE LAVINE

MOST HIGH ENERGY PHYSICISTS agree that the next major project after completing the Large Hadron Collider at CERN is to build an electron-positron linear collider operating at the trillion-volt (TeV) energy scale. Innovative designs for such a machine, which will stretch tens of kilometers and cost billions of dollars, have been evolving for over a decade. These design efforts have converged on a few favored approaches (see the article by Gregory Loew and Michael Riordan in the Winter 1997 issue of the *Beam Line*, Vol. 27, No. 4). An international collaboration headquartered at DESY has pursued one avenue that uses superconducting microwave cavities to accelerate electrons and positrons (see the article by Reinhard Brinkmann in the Fall/Winter 1998 issue of the *Beam Line*, Vol. 28, No. 3). Another promising approach, which employs copper cavities operating at close to ambient temperature, has been pioneered by the Stanford Linear Accelerator Center and Japan's High Energy Accelerator Research Organization (KEK, formerly the National Laboratory for High Energy Physics).

For more than a year, SLAC and KEK have been working closely together toward achieving a single design for such a next-generation linear collider. This joint R&D project occurs under an inter-laboratory memorandum of understanding signed in February 1998 by SLAC Director Burton Richter and KEK Director Hirotaka Sugawara. Well before this agreement took effect, however, researchers from both laboratories had built extensive R&D facilities to test some of the major subsystems required in such a TeV-scale collider. In the following articles, Seigi Iwata of KEK and Theodore Lavine of SLAC describe these facilities and the encouraging progress made with them to date.

—Michael Riordan