**** A big new solar neutrino detector is also being constructed in the Baksan Laboratory in the Soviet Caucasus. A report will be included in our June issue.***

ectron polarization, eventually attaining 71 per cent at 1.26 eV. The thick sample showed no such enhancement.

A way is open for high polarization and high quantum efficiency photocathodes for linear accelerators.

JAPAN Super-Kamiokande goes ahead

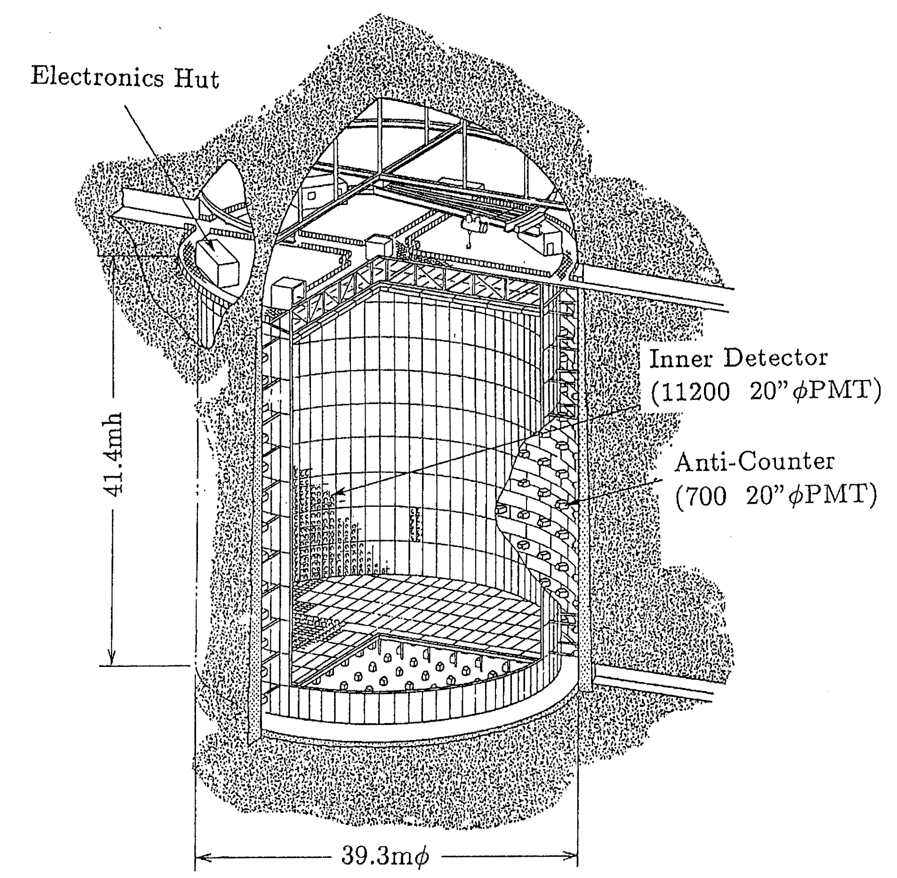
Now approved and funded is the Japanese Super-Kamiokande project for a greatly enlarged underground neutrino detector. Costing 8.7 billion yen ($62 million), construction is getting underway now and will continue until early 1996.

The detector will contain 50,000 tonnes of water, viewed by 11,200 50-cm diameter photomultiplier tubes to pick up Cherenkov radiation from traversing particles.

Underground physics began in the Kamiokande mine in the mid-80s, the existing detector using some 3,000 tonnes of water.

Neutrino observations from the 1987 supernova showed that neutrino astronomy has now an important role to play, while the ongoing goal of solar neutrino studies is to establish a complete picture of neutrino emission from the Sun.

The motivation for many underground experiments came from Grand Unified Theories (page 1) and their prediction of an unstable proton. With no sign of this instability yet found, the big new detector will be able to probe longer decay times (10^{33-34} years).



Sketch of the Japanese Super-Kamiokande underground neutrino detector, scheduled to come into operation in 1996.

SUPERCOLLIDER Preparing for experiments

Following an initial selection of two experiments from the letters of intent submitted last year (March, page 3), preparations for the research programme at the planned US Superconducting Supercollider (SSC) continue.

A two-detector scenario consisting of the SDC Solenoidal Detector Collaboration led by George Trilling and the L* collaboration led by Sam Ting has now been endorsed by the SSC Laboratory as providing opportunities for an outstanding initial scientific programme with significant complementarity, but which will need the full participation of the international community.

The next stage is submission of a technical proposal/design report from each of the two experiments by April next year, showing that its total cost will not exceed $500 million unless firm commitments from overseas expand the budget envelope.

This financial ceiling has serious implications in particular for the L* proposal, where an independent assessment indicates costs considerably in excess of $500 million. Cost reductions of some 15 per cent in the basic detector design are being sought.

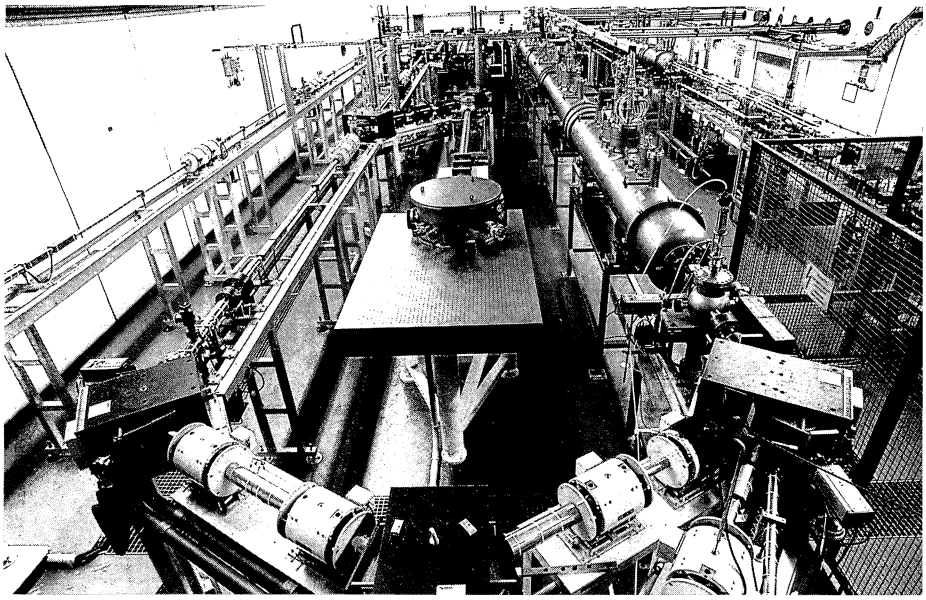
In addition, a revised L* management structure has been proposed, with an Executive Committee led by spokesman Sam Ting, and a new Management Board whose Chairman will also act as leader of the US groups in the collaboration. Barry Barish of Caltech has been elected to this new position.

Meanwhile the now traditional SSC Industrial Symposium, held this year in Atlanta, attracted strong interest. Department of Energy SSC Project Manager J. Cipriano and SSC Laboratory General Manager E. Siskin stressed that building the 87-kilometre ring and associated infrastructure to the proposed budget and schedule will be a major challenge, for which any delays would add about a million dollars per day.

'We're going to build what we said we would build and we're going to be relentless in doing it,' insisted Siskin. From the perspective of the IISSC meeting, the project resembles somewhat a major defence-style project than a traditional approach to physics facility construction.

The big meeting mirrored the enthusiasm and momentum now behind the SSC project in the wake of Gulf War successes. The initial physics community which launched the SSC idea is now only a part of what has become a major national undertaking, backed by impressive resources and widespread commitment from the US Administration, from Congress, from local authorities, from the educational sector, and especially from industry.

The S-DALINAC superconducting electron accelerator at Darmstadt. Right is the pre-acceleration and injection beamline into the 10 MeV injector. After an initial pass through the 40 MeV linac (centre right), the beam is recirculated twice using the two beamlines on the left. The electron beam can also be deflected from the first recirculation beamline into the undulator of a free electron laser (background). The tunable infrared laser beam's 15 m optical cavity is seen centre.



DARMSTADT
Superconducting electron accelerator in operation

In December, the S-DALINAC superconducting radiofrequency electron accelerator at the Nuclear Physics Institute of Darmstadt's Technische Hochschule was completed. This pioneer continuous-wave (c.w.) machine passed a major milestone several years ago when it accelerated its first low energy electron beam (September 1987, page 34).

The S-DALINAC consists of an injector and a main linear accelerator where the electron beam is accelerated three times (an initial acceleration pass and two subsequent recirculations). It has been operated so far with beam energies of 6, 29, 52 and 75 MeV, and after initial acceleration tests will be slowly tuned up to its rated energy of 130 MeV.

With the CEBAF electron machine (to provide continuous electron beams at 4 GeV) now under construction at Newport News, Virginia, and with European nuclear physicists pushing for high energy electron machines (January/Februa ry, page 22), initial S-DALINAC performance will be followed with much interest.

The Darmstadt accelerator, designed mainly for nuclear physics and free electron laser (FEL) research, was originally planned by a collaboration between Wuppertal's Gesamthochschule and Darmstadt's Technische Hochschule.

Built at the latter institution by a enthusiastic team comprising a small scientific staff, a lot of students and only a few technicians, its successful completion shows how an advanced and sizable technical project can still happen at a University laboratory.

(Another recent example, also Germany, is the MAMI continuous electron source at Mainz, using conventional accelerating technol gy – April, page 12).

The Darmstadt accelerating ca ties – one 0.25 m 5-cell cavity a