



Sol Gruner

CHES Director's Message

Sol M. Gruner - *Dept of Physics, Cornell University*

These are exciting and very busy times at CHES. The NSF renewed 5-year agreements with Cornell for operation of both CHES and the Laboratory of Nuclear Studies (LNS), which operates the storage ring, and the NIH renewed a 5-year grant for MacCHES, the Macromolecular Resource at CHES. In addition, the National Institute of General Medical Science (NIGMS) granted funds for a much needed upgrade of the stations used for macromolecular crystallography (A-1, F-1, and F-2) and the NSF awarded a grant to CHES and a group of Cornell faculty for construction of three new beam lines for investigation of materials ranging from electronic nanostructures to biomaterials. These awards insure continued improvement and operation of CHES for at least the next half-decade.

Wilson Laboratory has been a beehive of activity. The number of changes which have occurred in the last year easily exceeds the sum of all changes at Wilson Lab over the last 7 years. Storage ring operations shut down in May '99 for a long-planned upgrade of the high energy physics detector, the linac injector, and installation of a complete set of four superconducting RF cavities. CHES took the time of the enforced shutdown to completely rebuild the optics and layout of the F-area. Construction began on a new 50-pole wiggler to replace the present 24-pole wiggler which feeds the A-line area. The new wiggler, slated for installation in early 2001, will provide X-rays for A-1 and A-2, as well as the new beam lines. At the same time, a very ambitious civil construction schedule commenced on the Cornell-financed underground building to house the new beam lines. Last Sept. 8th we celebrated the achievement of meeting the deadline for excavation, construction and reburial of the critical shielding wall and shell of the building, without which resumption of stored beams would have been impossible. Operations resumed in the Fall of '99 and are continuing with only brief interruptions on into 2001.

The benefits of all these changes are substantial, both for CHES users and for the high-energy physics done at Wilson Lab. The RF cavities will eventually allow half an Ampere each of stored electron and positron beams, which will double the CHES X-ray flux. The F-area upgrades are designed with better X-ray optics to improve beam stability, flux and energy resolution, to ease equipment maintenance, and to provide a more comfortable environment for users of the F-area. New, larger CCD detectors and better computers, software and faster networking are providing substantial benefits to macromolecular users. The new beam lines, slated for commissioning in mid-2001, will be among the highest flux beam lines in the world and will provide new capabilities, both to Cornell faculty and to other CHES users. The full impact of all these upgrades will be progressive, both because some of the upgrade components are not slated for installation before 2001 and because there will be an inevitable learning curve in integrating new equipment, and ramping up currents and fluxes.