

CHESSE Director's message

Bob Battenman

1993 was a watershed year for CHESSE. Over the course of the year, we completed a 3 year funding cycle with the National Science Foundation and submitted, for the first time, a five year competitive renewal. Also spanning the course of the year, a major decision about the construction of a B-factory at either Cornell or Stanford was imminent. Needless to say, CHESSE's future direction and makeup were pivotally connected to these two events.

Our NSF site visit went well, and it was recommended to the National Science Board that our funding continue, at a modest increase - subject to a decision on the B-factory. In the fall, the B-factory decision of the DOE was finally handed down - Stanford was chosen.

This news was received at CHESSE with mixed feelings. On one hand, we lost the chance to build a new x-ray laboratory with continuously operating undulators and wigglers, and prospects of more than an order of magnitude increase in available flux. On the other hand, we have avoided the inevitable shut-down of two to three years for construction and commissioning.

Arguably, the loss of the B-factory may be no loss for CHESSE users. Wilson Laboratory has received \$36 million from the NSF to substantially upgrade the high-energy physics program. We expect, over the next five years, a systematic increase in CESR beam currents by up to a factor of five. With increased beam currents and only short term interruptions for equipment improvements, CHESSE users can continue to depend on high-flux high-intensity x-ray beams for their scientific programs.

In short, by the end of 1993, CHESSE funding for the next five years had been approved by the National Science Board. In addition, MacCHESSE had also completed a successful 5-year competitive renewal through the NIH.

On the experimental floor, the construction of the new A-line is now finished. The A1 station receives half of the radiation from our new 24 pole 1.2 T wiggler and is tunable from 5-14keV with both vertical and horizontal focussing. Measured fluxes are even greater than our premier F1 station.

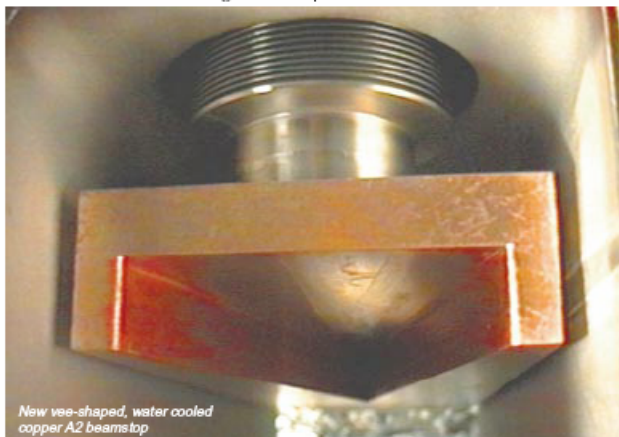


A2 receives the other half of the wiggler beam. The hutch is much larger than its predecessor. It provides a tunable high-angular resolution beam from an extremely flexible vacuum monochromator housing. Two A2 mirrors are being designed and constructed under a joint project with the APS. The double-focussing toroidal white beam mirror will provide unprecedented photon intensities and be used by APS staff as a high-heat-load test facility for optics and machine components.

Looking ahead, we plan a major new effort to design and construct CCD two-dimensional x-ray detectors. An ongoing collaboration with Professor Sol Gruner of Princeton University has led to the development of CCD detectors for protein crystallography at CHESSE. With MacCHESSE funding, we now have a 1K x 1K CCD detector. Initial runs on F1, F2 and A1 have produced data of exceptional quality (see page 36).

From this initial success, it is clear that CHESSE users could benefit greatly if a variety of CCD detectors were available for all experimental stations. To this end, we plan to use part of a Keck Foundation grant to MacCHESSE, and other pending support, to form a detector construction and support group within CHESSE.

In conclusion, over the next five years we anticipate higher beam currents, more stable beam positions, and a CCD development program that provides new capabilities in x-ray imaging, diffraction, and time-resolved studies. Among others, we hope that these factors will significantly enhanced the scientific programs of CHESSE users.



New vee-shaped, water cooled copper A2 beamstop