InterCAT Technical Working Group Meeting
June 15, 2000

Agenda Review and TWG Activity Summary: (Steve Heald)
Steve called the meeting to order and reviewed the agenda.

Facility Reports

Facility Update/News: (Steve Davey)
Steve reported that a study has been done to evaluate installing two ID lines at one sector. He reviewed the feasibility of the two potential scenarios (small offset and large offset) and summarized the components potentially impacted and possible complications. This modification is of interest to some of the biology community and sector 4. The report is being drafted and will be available.

CAT Reports

CCD detectors and storage rings: Past, present, and future: (Andy Howard)
Andy reviewed the content of his presentation and noted that CCDs (charge-coupled devices) are a very effective tool for data collection in macromolecular crystallography.

What is a CCD?
- converts visible light to charge
- ideal for solid-state cameras
- chip size range 1–6 cm and larger (fabrication errors increase as size increases)

Making x-ray detectors from CCDs
- CCDs are sensitive to x-rays and can be damaged by them
- Andy discussed various optical systems designed by adding x-ray sensitive phosphors

How to collect diffraction data
- method developed in the 80s
- CCDs share common properties with multiwire proportional counter systems (MWPCs) and image plates
- Andy described the evolution of the technology and reviewed properties

Processing single-crystal diffraction data
- the software for MWPCs is readily adapted
- Andy reviewed some special features that need to be taken into account (most involve straightforward adaptations of code written for earlier technology)

Non single-crystal applications
- e.g., fiber diffraction, solution scattering, and surface studies
- often need to implement slight changes in detector hardware
- often involves changes in how the sample is held or manipulated during data collection

History of CCD detectors
- Andy reviewed several commercial CCD systems available in 2000

Future CCD systems: APS users will play a role in directing advances in new systems
- faster readouts
- larger front face area
- larger CCD area

smaller pixels
lower read noise
better interfacing to goniostat
better user interface
better interface to strategy and processing software
lower cost

What happens after CCDs?
digital "pixel array" detector
analog "pixel array" detector
channel plate
amorphous silicon
(Andy discussed the current status of these projects)

Next Meeting
The meeting will be held Thursday, July 20, 2000, in conference room A1100.