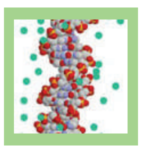
Some Users' Research Results:
(over 300 publications in the last year)

2003 Nobel Prize in Chemistry

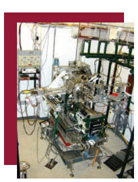
Rod MacKinnon shares the 2003 Nobel Prize in Chemistry for his work in elucidating the structure and function of membrane ion channels. MacKinnon, a biophysicist and self-taught x-ray crystallographer, is a professor at The Rockefeller University and is a Howard Hughes Medical Institute investigator. His work explains how a class of proteins helps to generate nerve impulses - the electrical activity that underlies all movement, sensation, and thought. The work leading to the prize was done primarily at CHESS and the National Synchrotron Light Source at Brookhaven National Laboratory.

Measuring Forces between DNA Molecules



The Pollack group in the School of Applied and Engineering Physics at Cornell University has recently shown that careful x-ray measurements can be used to get quantitative information about the electrostatic interactions between DNA molecules in solution. Their work was published recently in a Physical Review Letter article entitled "*Measuring Inter-DNA Potentials in Solution*".

Studying Film Growth on the Atomic Scale



The Brock group in Applied and Engineering Physics at Cornell University has used a surface-scattering technique with atomic-scale sensitivity to investigate the early stages of nucleation and growth during Pulsed Laser Deposition of complex oxide films. This work has uncovered an energetic mechanism which promotes formation of nearly perfect surfaces and interfaces, and has provided the group with the means to engineer materials on the atomic scale.

Cornell High Energy Synchrotron Source...

...is a high-intensity X-ray source supported by the National Science Foundation.

CHESS provides our users state-of-the-art synchrotron radiation facilities for research in Physics, Chemistry, Biology, and Environmental and Materials Sciences. A NIH Research Resource, called MacCHESS, supports special facilities for protein crystallographic studies.

CHESS serves a wide spectrum of experimental groups from Universities, National Laboratories and Industry. Each year, 500-600 scientists, graduate and under-graduate students visit CHESS to collect data. In addition, a significant effort of the staff is aimed at developing synchrotron radiation experimental facilities and methods that utilize the high intensity photon flux provided by the Cornell Electron Storage Ring (CESR).

Beamtime

CHESS averages 110 running days per year.
No charge for non-proprietary research, but proposals are required. Support is provided for routine data collection (protein crystallography, etc.) as well as for novel experiments.

For more information contact our User Administrator:

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CHESS Tours

Visitors are welcome.
Individual or group tours are available to the general public. Please call to schedule.

Cornell High Energy Synchrotron Source

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Station	Source	Energy	Detector(s)	Type of Experiment
A1	49 pole wiggler	12.68 keV	ADSC Quantum-210	Monochromatic macromolecular crystallography; Se SAD
A2	49 pole wiggler	7-60 keV	MAR345; CCD; XFlash; Bede, Si and Ge energy-dispersive detectors available upon request	X-ray diffraction and scattering; High-resolution diffraction; Microbeam; X-ray standing waves; Imaging
B1	Hard-bend magnet	White beam	Fuji image plates; energy-dispersive detector	High pressure using diamond anvil-cell; Laser and resistive heating
B2	Hard-bend magnet	5-35 keV	Solid state detectors, ion chambers, MAR345	High pressure using DAC; EXAFS
C1	Hard-bend magnet	5-35 keV	Solid state detectors, XFlash; Gruner and FLI 1k×1k CCD, NaI, etc.	Very flexible: 4 circle diffraction; Resonant scattering including ASAXS; SAXS; IXS; Polarimetry; Topography
D1	Hard-bend magnet	6-16 keV or 10-30 keV	Medoptics CCD; Roentec XFlash	GISAXS/GIWAXS; SAXS/WAXS; Fluorescence imaging
F1	24 pole wiggler	13.51 keV	ADSC CCDs: (two) Quantum-4; Quantum-270 (coming soon)	Monochromatic macromolecular crystallography; Br SAD
F2	24 pole wiggler	7.1-14.3 keV	ADSC Quantum-210	MAD: multi-wavelength anomalous diffraction; SAD: single wavelength diffraction; Monochromatic macromolecular crystallography
F3	Hard-bend magnet	6-20 keV	Quantum-4u; Vortex and XFlash (high count-rate energy dispersive detectors); Bicron scintillation detector	High-resolution scattering; EXAFS; Near-edge diffraction; Oscillation crystallography; Scanning x-ray spectroscopy
G1	49 pole wiggler	8-13 keV	Finger Lakes CCD	SAXS, GISAXS, WAXS
G2	49 pole wiggler	7-12 keV	Wire linear detector, point detection	High-resolution diffraction, GIXRD
G3	49 pole wiggler	7-12 keV	Fast (Bede) scintilator	*In-situ* studies of thin-film growth