ILL Millennium Programme

New Materials studied with New Machines

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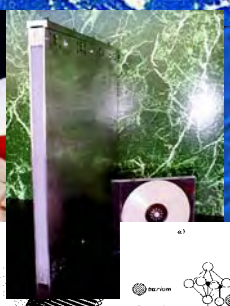
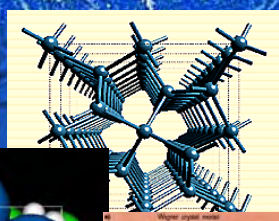
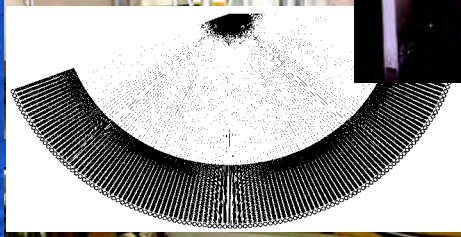
NEUTRONS FOR SCIENCE

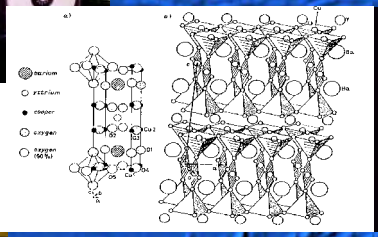


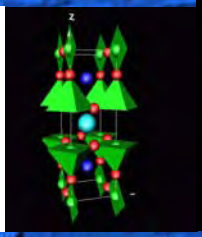
Super-D2B High Resolution Diffractometer

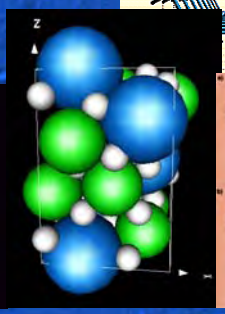
- Very high resolution of complex structures
- Large array of fine collimators/detectors
- Structure of hydrogen storage in metals
- Energy-efficient superconducting materials
- New phases of ice & hydrogen bonding
- Magnetic & magneto-resistive materials

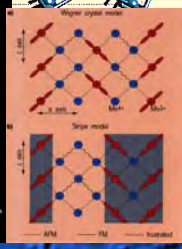


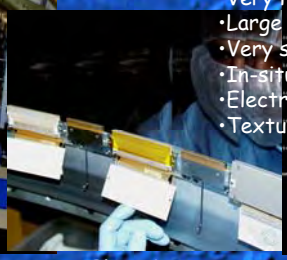






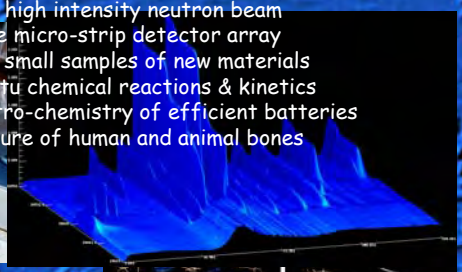


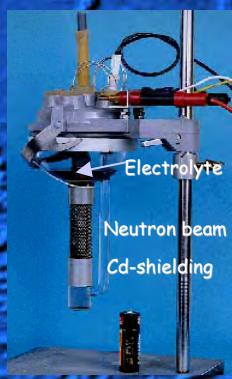




New D20 High Intensity Diffractometer

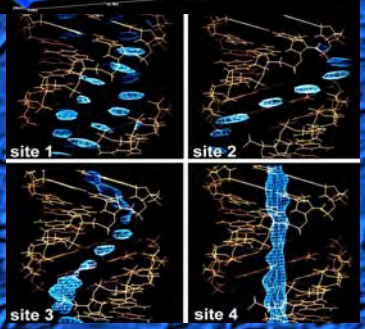
- Very high intensity neutron beam
- Large micro-strip detector array
- Very small samples of new materials
- In-situ chemical reactions & kinetics
- Electro-chemistry of efficient batteries
- Texture of human and animal bones

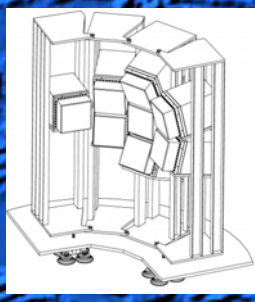




VIVALDI Image Plate Detector

- Very intense white neutron beam
- Electronic photography using image plates
- Reciprocal space exploration
- Study of structural & magnetic transitions
- Structure of new quasi-crystalline materials





New D19 Large Array of 2D Detectors

An array of 200x200mm 2D detectors
Very efficient protein/fibre diffractometer
Hydrogen bonding in biological molecules
Role of water in the structure of DNA fibres

Neutron Strain Scanner

- Stress-strain in large industrial components
- Very intense, finely focussed neutron beam
- Precise orientation of large objects
- Cracks in jet turbine engines
- The strength of welds in oil pipelines
- Work hardening of railway lines

New D4 Liquids & Amorphous Machine

- Hot, short wavelength neutron beam
- Array of micro-strip detectors
- Atomic structure of amorphous materials
- Structure of ionic solutions
- Isotope phase contrast

New D3 and He³ Polarised Neutron Filter

- Laser pumped polarisation of He³ filter
- Intense magnetic field & low temperature
- Hot neutrons for high structural resolution
- Neutron polarimetry for magnetic materials
- New complex magnetic structures
- Subtle bonding effects between atoms