Super-D2B at ILL Grenoble

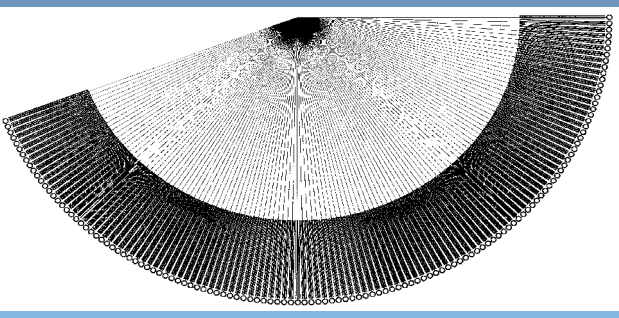
High Resolution Neutron Diffractometer

http://www.ill.fr/dif/epsrc/d2b.html

J.P.Attfield[1], P.D.Battle[2], J.L.Finney[3], C.Greaves[4], K.Prassides[5], S.A.T.Redfern[6], B.Raveau[7], A.W.Hewat[8], E.Suard[8], C.Ritter[8]

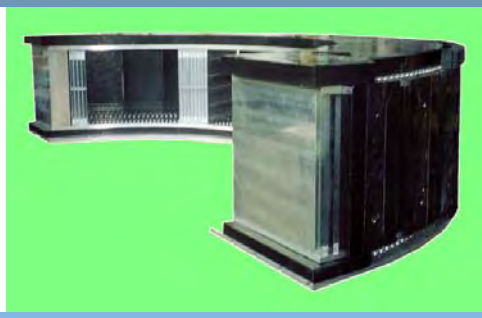
[1]Edinburgh; [2]Oxford; [3]UCL London; [4]Birmingham; [5]Durham; [6]Cambridge; [7]Caen; [8]ILL Grenoble

- An Array of 128 Linear Wire Detectors
- A Bank of 128 High Resolution Collimators
- New Shielding and Software
- Efficiency Increased by 600%
- Smaller Samples or Higher Resolution
- Peak/Background Ratio Improved

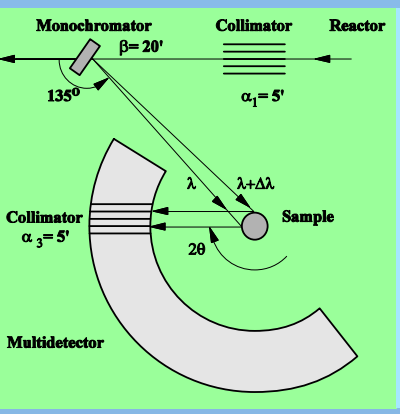


Array of 128 Collimators & Linear-Wire PSD Detectors

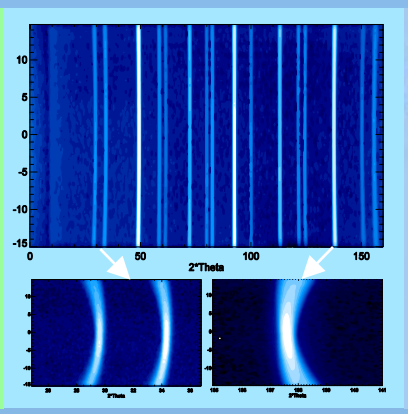
Collimator/Detector Details



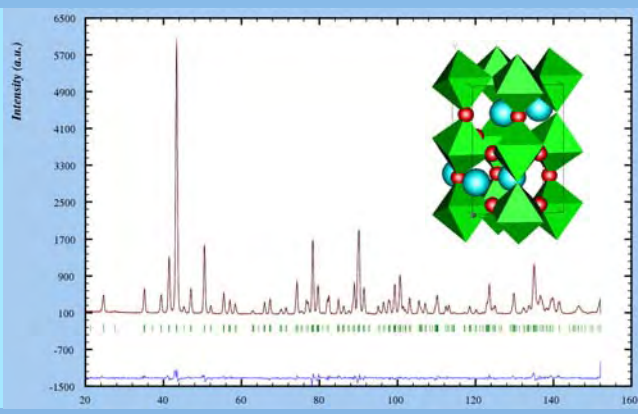
The complete Super-D2B Detector Box



Wavelength focussing on D2B

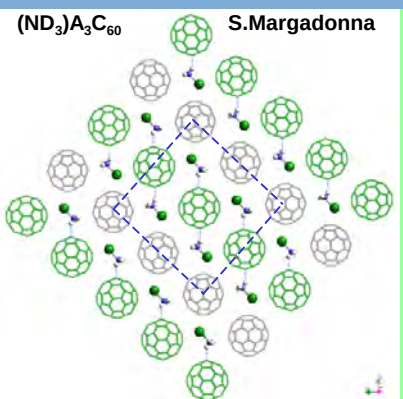


2D Pattern integrated over curved lines

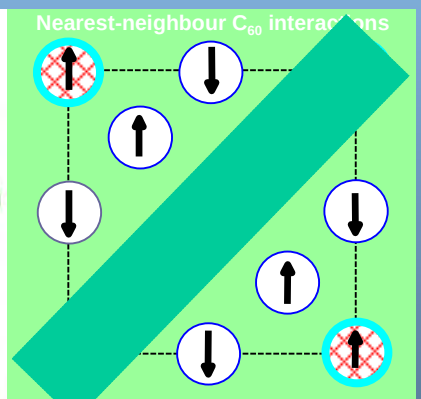


Manganite Pattern in only 2 x 2.5 minutes ! (C. Ritter)

Fullerides & Framework Materials - S.Margadonna (Edinburgh)



Network of N–D•••π(6:6) interactions
Orthorhombic structure, [110] plane

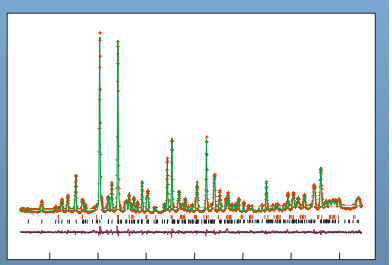


Influence of ND_3-C_{60} close contacts on magnetic exchange interactions

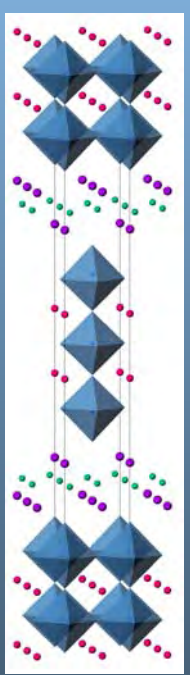
Strong effect on *nn* AF interactions along ferrorotationally ordered C_{60} stripes

Aurivillius Phases - E. McCabe (Birmingham)

Structure of $Bi_2Sr_{1.4}La_{0.6}Nb_2MnO_{12}$



- Disorder of Bi and *A* site cations
- Ordering of *B* site cations
- Local rotation of octahedra
- Spin glass
- Ferromagnetic interactions



- Neutrons are electrically neutral & more penetrating than X-rays.
- Neutrons interact with nuclei & locate atoms more precisely.
- Light atoms scatter neutrons as strongly as heavy atoms.
- Neutrons are tiny magnets, & determine magnetic structures.