FOR YOUR SAFETY...

BASIC SAFETY INFORMATION FOR VISITORS

FIRE
- Bells ring inside the building affected
- Leave the building immediately by the nearest exit

SITE EMERGENCY
- Klaxon horns sound outside buildings
- Remain in or enter nearest main building

CONTROLLED AREAS
- Radioactivity, Laser Radiation, HighVoltage
- Obey the instructions. Do not enter unless accompanied and authorised to do so

GENERAL HAZARDS
- Obey all instructions, warning signs and notices

PARKING
- In authorised areas only

SPEED LIMIT
- 20mph

If in difficulty, telephone Ext. 5545 - The Main Gate
To call the Ambulance or Fire Brigade, telephone 2222

PLEASE NOTE:

- CLRC operates a No Smoking policy in all buildings
- Eating and drinking is only permitted in the designated areas
- If you have any queries ask a member of staff (who, at the weekend, will be wearing green T-shirts)

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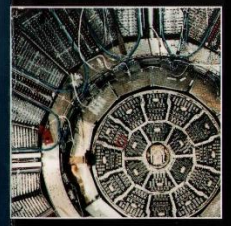
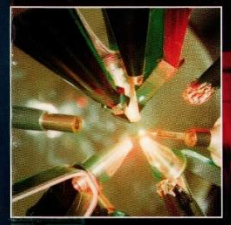
Tel: 01235 821900 Fax: 01235 445808
http://www.cclrc.ac.uk

1998
OPEN DAYS
at CLRC Rutherford Appleton Laboratory

SITE PLAN AND GUIDE TO EXHIBITIONS






FRIDAY 26 JUNE
Press, invited visitors and schools

SATURDAY 27 JUNE
Public Day

SUNDAY 28 JUNE
Staff, their friends and their family

MONDAY 29 JUNE
Industry day

TUESDAY 30 JUNE
Invited visitors and schools

WEDNESDAY 1 JULY
Invited visitors and schools

THURSDAY 2 JULY
Schools

CLRC

CLRC
CENTRAL LABORATORY OF THE RESEARCH COUNCILS

A1-2 The birth of stars and the search for life **R68**

Discover how astronomers are searching deep into the clouds of space to find how stars and planets form - see samples of Martian meteorite and find out how the search for life beyond Earth is progressing. A full scale model of the Infrared Space Observatory is also on display on the lawn outside R68.

A3-4 Satellite ground station and tracking **R68**

See the RAL ground station and its 12 m antenna, currently tracking a satellite which is observing the Sun. A display shows the data minutes after it is received, sent for processing in the USA and published on the World Wide Web.

A5-6 Astronomical Computing **R68**

See how UK astronomers share computer techniques and data using the Starlink network. And see a computer-animated system being developed at RAL being used to control the large Gemini telescope (a scale model of which is on display).

A7 Rosetta : Rendezvous with a comet **R25**

See how scientists are planning to land a probe for the first time on the surface of a comet. What are the engineering challenges of an eight-year journey thorugh cold space?

A8-9 The solar wind and its effects on Earth **R25&R46**

What happens when particles from the Sun hit our atmosphere? See how the huge EISCAT Radar helps to explain the Northern Light. What is an ionosonde? Come and see how techniques developed by Sir Edward Appleton are used to explore the Earth's ionosphere.

A10 Testing for space **R25**

See how space instruments are built and tested in special clean conditions. On show is a full-scale model of the huge JET-X telescope, tested in the nearby Space Test Chamber.

A11 The Cassini-Huygens mission to Saturn **R25**

In September, the Cassini spacecraft was launched on a seven-year journey to Saturn. See the Engineering Model of its probe, Huygens, due to parachute onto the surface of Titan (a moon of Saturn), and instruments which will study its surface.

C1 WWW **R1**

Web of today: intelligent use of the World Wide Web; the Aquarelle and Chameleon projects and the 'web of the future' Also see C8 - the Cybercafe below.

C2 Knowledge engineering **R1**

CLRC in partnership with European industry, developing an information system to aid flood control in Bordeaux.

C3 Do we really need paper? **R1**

We spend most of our business and private life filling in forms! Why not make it easier and safer?

C4 Manicoral **R1**

How Internet-based tools can widen the scope for collaborative working across a number of European sites.

C5a-b Computational methods & materials modelling **R1**

How computational methods are used to tackle large problems and supercomputer modelling of the atomic scale properties of materials is leading to new catalysts and improved electrical batteries.

C6 Computer Training **R1**

See the excellent facilities used to provide first class tuition.

C7 Cybercafe **R1**

Drop into the Cybercafe and gain hands-on experience of the wealth of experience that makes up the World Wide Web.

C8 ERCIM **R1**

Find out more about the consortium of national institutes specialising in Information Technology and Applied Mathematics research and development.

C9 & C11 Virtual Reality & Medialab **R18**

Virtual reality and the Medialab provide exciting new opportunities to interactively explore and display the worlds of scientific data, engineering design and advanced technological systems.

C10 Video conferencing **R18**

RAL runs approximately ten video conferences a week, enabling staff and partners to save time, avoid stress and work more productively.

C12-13 The Radio Communications research Unit,(RCRU) **R25**

Introducing the range of the RCRU's programme including cellular TV, millimetre wave transmissions in cities, and meteorological instruments - the RCRU is the UK's leading centre for this type of work.

C14-16 Radars and the weather **R25**

PC demonstrations of computing radar echoes from ceroplanes, signal distortions in the ionosphere and cloud effects on satellite communications. How rain and ice is imaged with rain radars, and see inside a 94Ghz radiometer. Solving Maxwell's equations and forecasting ionospheric weather.

E1-6 Harnessing the power of the wind & Sun **Wind test site**

Visit the 45 kW Windharvester wind turbine. Visible from the A34 and beyond, this turbine has a 17 m rotor diameter. A photovoltaic/wind power system, fywheel storage systems, The biggest instrumented wind turbine blade in Britain, a 16kW wind turbine with a direct drive generator, the control hut and data logging facilities are all on show.

E7 **outside R63**

A 17 m blade from a 2 bladed 300kw wind turbine.

E8-9 The global environment - a view from space **R68**

See how space instruments are being used to monitor global temperatures and the ozone hole. Images and data from space allow us to monitor forest fires, sea currents (e.g El Nino) and vegetation. Spacecraft also help us to understand the chemistry of our atmosphere. Images, instruments, quizzes and more.

E10 Studying the atmosphere - in a lab **R25**

To monitor the gases in the upper atmosphere which cause global warming and ozone depletion, we need to have reliable measurements. See how this is done using a 9 m-long tank and a hi-tech spectrometer.

I1 Introduction to ISIS **R6**

An overview of ISIS, the world's most powerful pulsed neutron and muon source - including a video, models, industrial links and other displays.

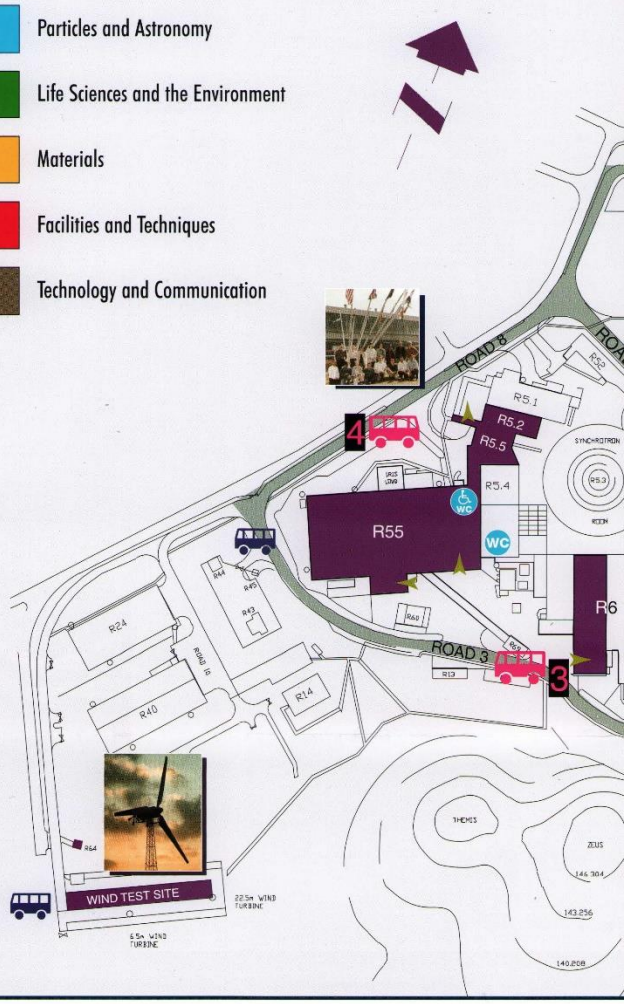
I2 Neutron defraction **R6**

Crystals and glasses play an important role in many aspects of our life. ISIS is used as a microscope to see how atoms and molecules are arranged inside these materials, helping us to understand why they do what they do.

SITE PLAN

KEY TO EXHIBITION AREAS

- Particles and Astronomy
- Life Sciences and the Environment
- Materials
- Facilities and Techniques
- Technology and Communication



I3 Muons **R6**

Muons are sub-atomic particles which live for only two millionths of a second but we can still use them to study materials at the microscopic level. Come and learn about the short life of an ISIS muon.

I4 Large scale structures **R6**

Find out how ISIS neutrons are used to study surfaces and discover the importance of interfaces in every day life, ranging from washing up to storing information on a computer disk.

I5 Neutron spectroscopy **R6**

Neutron spectroscopy tells us how atoms move within materials and is one of the best ways of studying magnetism: see some real levitation demonstrating the principles of superconductivity.

I6 ISIS computing **R55**

ISIS is highly dependent upon computers, not only for its day to day running, but also for its continual evolution. Computer aided design and advanced instrument control are just two aspects in constant use.

I7 NMR **R34**

At the National Biological Solid State NMR centre, workers from Oxford University are pioneering the use of high magnetic fields to visualise small molecules and hormones in their natural site of action in cell membranes.

L1-6 Why is the sky blue? Can light bend? Can you stop time? Can you write with light? **R1**

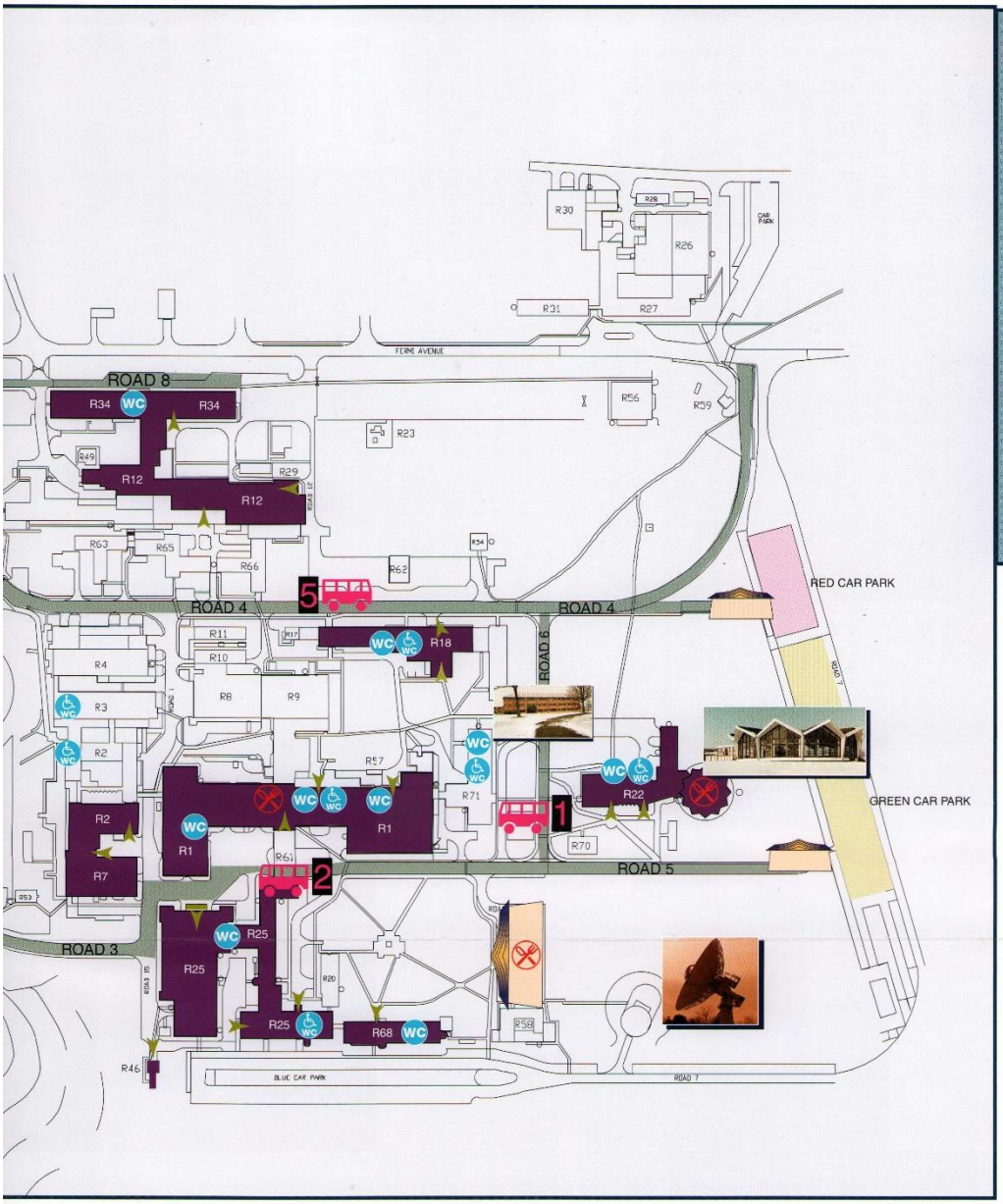
Have you ever wondered why the sky is blue? Exhibits will demonstrate the scattering of light in the sky. From here you will be lead into the world of pollution monitoring and deeper into one of the basic processes in life, photosynthesis.

L8-11 High Power Laser **R1**

See one of the world's most powerful laser systems from the viewing booth. Examine some of the parts ranging from laser targets that are smaller than the diameter of a human hair to the 3000 amp fuse! See how it is possible to amplify light using glass. The inner workings of the amplifiers will be on display. Follow the laser pulse from start to end with a computer generated virtual tour of the laser system from the air.
Also see the target chambers in target area West - after exhibit L15 (in the next column).

L12-15 Mirrors, patterns & stars **R1**

Mirrors that you can see through, others that reflect only one colour and those that reflect different colours in different directions! Find your way through our 'light maze'! Discover for yourself how special plastics and supersonic air jets can turn a beam of laser light into all sorts of patterns. Examine the 'plasma ball' using your very own light analyser - which you can keep!- and see how we can use the light from stars to unlock the secrets of the Universe.



Bus stop

Minibus

Visitor toilets

Disabled toilets

Exhibits suitable for families with children

Activities of particular interest to industry

L16-17 The Titania Laser R2

In the laser's nerve-centre a video will show how a shot is fired and a computer animation will describe the generation of ultrashort laser pulses.

L18&21 High Voltage Generators R2

Watch a working 100,000 volt generator charge up and discharge with a flash and a bang! Its million-volt big brother, which powers Titania, will also be on show.

L19-20 & L22 Tiny targets...but, if you think lasers are small, think again R2

See tiny targets being precisely positioned in a vacuum chamber, ready for experiments with the focused laser beam. Then look through the laser to see the mirror array - there are hundreds of mirrors which steer 24 beams in and out of the lasers. An animation will give a beam's-eye view of the journey's of the beams which are matched to within a millimetre of one another.

P1 Karmen R55

Scientists will be on hand to explain this experiment which is looking for oscillations from neutrinos - the hidden particles of the Universe.

P2 Delphi R1

A model of the Delphi detector at CERN in Geneva plus see the control of Delphi, live from CERN. Also make your own analysis of reconstructed events

P3 Neutrinos R1

Examples of neutrino oscillation physics; a coupled pendulum model and computer simulation expalin this intriguing area of research.

P4-8 LHC preparations R12

See a model of the new Atlas detector which is being built for use at the Large Hadron Collider at CERN together with a model of part of the magnetic system in Atlas, an aircored superconducting toroid designed by CLRC.
Simulations illustrate the techniques used and advanced electronics, data processing and transmission required to detect one crucial event in many millions of other particle collisions. See also samples of lead tungstate to be used in the CMS as well as a silicon technology demonstration and, magnified, silicon modules - as will be used in the Atlas detector.

T1-2 Machining for precision R12 & R25

The mechanical workshop and the micro-machining facility offer complementary engineering skills and facilities to support CLRC's programme and other activities.

T3-7 Electronic and microelectronic systems R12

Modern PCB layout tools include features such as electrical and thermal simulation. These, and other techniques, are used in readout, control and drive electronics for a wide range of applications.
CLRC microelectronics designs are used in various fields, from medicine to particle physics, including complex electronics to process vast amounts of data and advanced integrated instrumentation: combining mixed signal microchip design with state of the art silicon detector technology to produce advanced detector systems.

T8-10 Detector systems R12

Resistive wire detector array and custom electronics used at the ISIS neutron source, how CLRC and the Royal Marsden Hospital have developed a full body camera to help treat tumours, and the development of Germanium detectors and the use of gas microstrip detectors.

T11 SR beamline technology R12

Mirrors to reflect synchrotron light, and the development of monochromators.

T12 FEA R12

Finite element analysis - a technique to model the behaviour of components before they are even built.

T13 Microstructures R12

The machining of microstructures developed with features smaller that the width of a human hair.

T14-15 Electronic test systems R12

Techniques used to test microchips and demonstrations of the use of computers, logic analysers, and software to ensure that electronic systems perform to specification.

T16 Cryogenic coolers R12

Mechanical refridgerators that cool to within a few degrees of absolute zero and work successfully in space for many years.

T17 Microstructure fabrication and test R1

Imaging and working with electrons, ions and other beams to produce and inspect micromachines and microstructures. The mechanical 'multimicropede' demonstrates the capabilities of CLRC. Also view the advanced minifab lab of one of CLRC's partner companies.

T18 Chemistry and materials R34

The use of resins and composite materials - see and handle examples of lightweight structures. Demostrations of materials testing.

T19 Electronic Design Automation software R12

Watch a live demonstration of an electronic design being loaded into a programmable device to implement an interactive video challenge. Modern, industry-standard EDA software and design flows are made available, at an affordable price, to the academic community for the training of new design engineers and for research purposes.

CLRC

Welcome to our Open Days

These Open Days give you the chance to see what goes on at one of the UK's premier scientific laboratories. You will see how CLRC is working in partnership with universities and industry in the UK and around the world in support of research at the leading edge; as well as helping companies improve their products and processes.

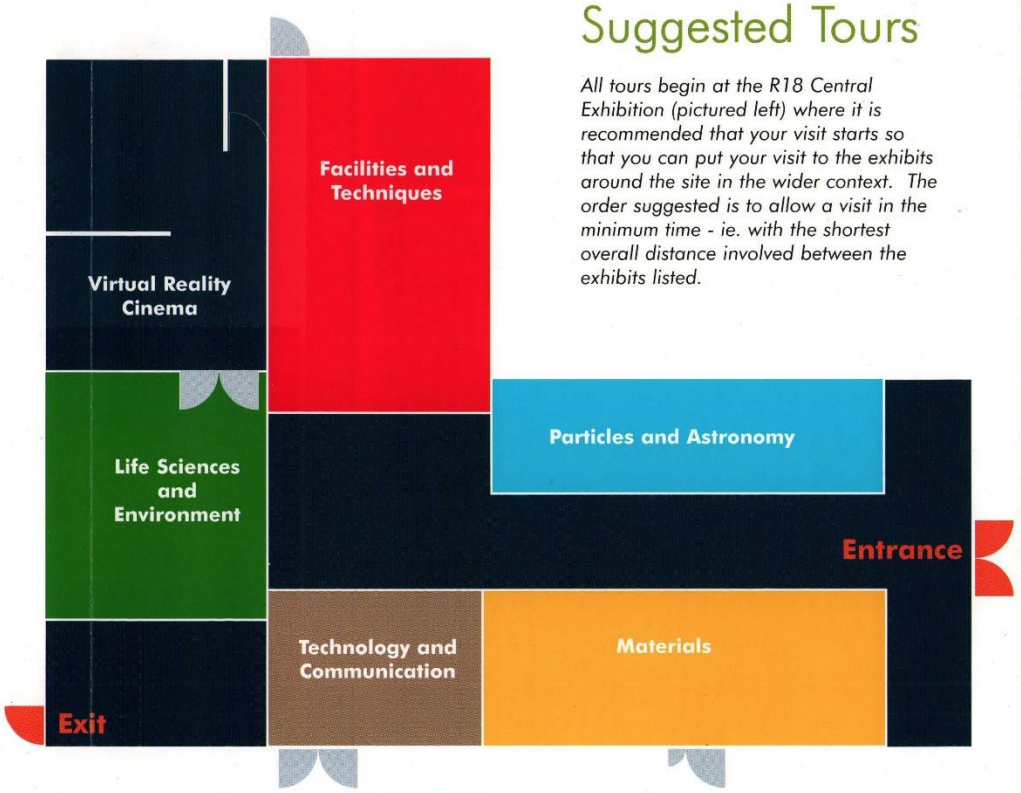
CLRC is an organisation which runs two leading research laboratories - the CLRC Daresbury Laboratory and the CLRC Rutherford Appleton Laboratory. More than forty years of scientific and engineering excellence underpins the provision of unrivalled support for university and industrial research in an ever-broadening programme of partnership activity. CLRC is part of the Department of Trade and Industry but earns its £100m annual budget through specific contractual agreements with the UK Research Councils and from industrial and other contracts with organisations all over the world.

Partnership successes include the Nobel Prize-winning work of MRC's Dr John Walker; Bookham Technology - one of the fastest-growing optical communication component companies in the world; environmental modelling and monitoring with NERC and a consortium of universities; X-ray monochromator and beamline component production under license with Oxford Instruments and VG Scientific, and high power laser development with EPSRC; surfactant solutions for Unilever; the identification of protein structures with BBSRC and university researchers; spin off companies such as Vector Fields; solar and stellar discoveries with PPARC and the UK particle physics community; microelectronics and microsystems design facilities for Europe with the EU; muon facilities with a substantial Japanese investment...and the list goes on...

Take advantage of the Open Days to see for yourself what has already been achieved with industry, with other research councils, with universities and with national and international organisations.

Enjoy your visit!

welcome



Suggested Tours

All tours begin at the R18 Central Exhibition (pictured left) where it is recommended that your visit starts so that you can put your visit to the exhibits around the site in the wider context. The order suggested is to allow a visit in the minimum time - ie. with the shortest overall distance involved between the exhibits listed.

Suggested Tours

Overview:
C9&11; T17; P2-3; C1; L8-11; T3-7; P4-8; I1-2; A11; E8-9

Life sciences & the environment:
E1-6; I7; C2; E10; A8-9; C12-14 &16; E8-9

Materials:
I1; I2; I3; I4; I5; C5; T18

Particles & Astronomy:
P2-3; P4-8; T3-7; T8-10; P1; A11; A7; A5-6

Technology & Communication:
C9&11; T3-7; T8-10; T16; C12-14&16; C1; C5; T17

Facilities:
T17; L8-11; L19-20&22; I1; I3; I7; A10; A3-4