

## LSF Operational Statistics

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### RAL-based experiments

In the reporting period (April 2004 to March 2005), 29 different User groups performed a total of 45 experiments in the LSF laboratories at RAL. A total of 3767 hours laser time was scheduled to the UK User community and European Users throughout the year. 4739 hours were delivered with only 112 hours downtime. This year saw an increase in the number of weeks biochemistry and decrease in physics scheduled. A breakdown is shown in Figures 1 and 2. The RAL-Based schedule is shown in Table 1. The average User satisfaction marks are shown in Figure 3. There were a total of 35 publications, 7 conference proceedings, 4 PhD theses and 1 report published during the reporting year.

Figure 1  
RAL based bids by subject group

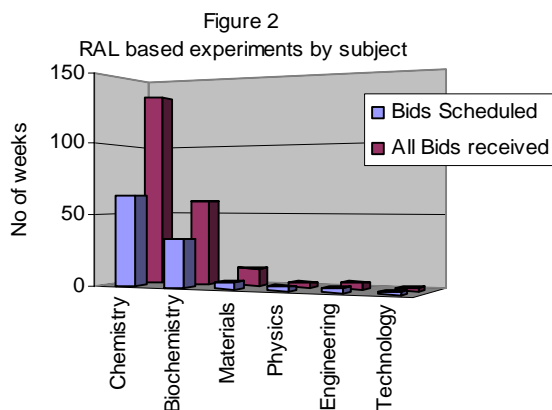
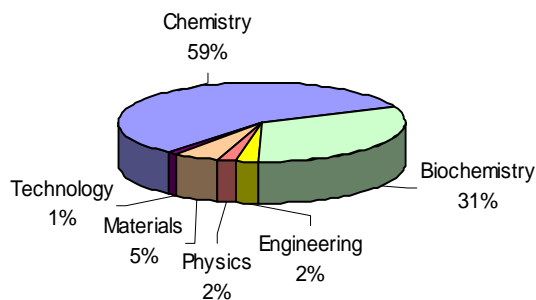
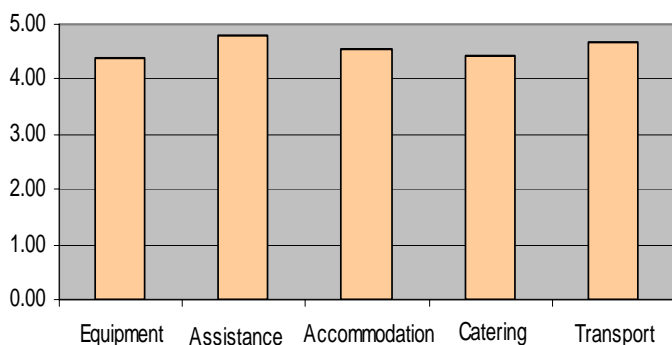


Figure 2  
RAL based average user satisfaction marks



### Loan Pool

The Loan Pool delivered 365 weeks of laser time in the reporting period. Downtime was 31 weeks and was mainly due to minor breakdowns throughout the year. In the laser loans there was 1 new group to the Loan Pool. The chemistry community was once again the biggest user with 51% of allocated time. The breakdown is shown in Figures 2 and 3. The Loan Pool schedule is shown in Table 2. The average User satisfaction marks are shown in Figure 3. There were a total of 12 publications and 6 conference proceedings and 2 PhD theses and 1 report published during the reporting year.

Figure 4  
Loan Pool bids by subject group

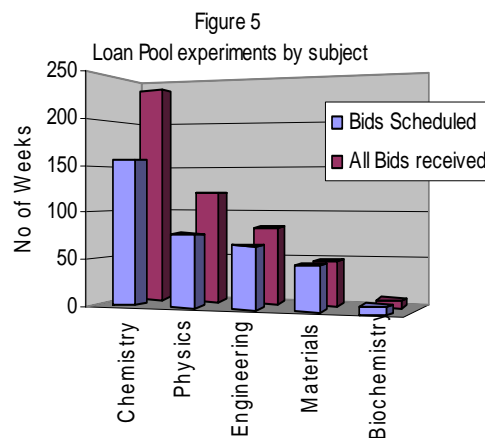
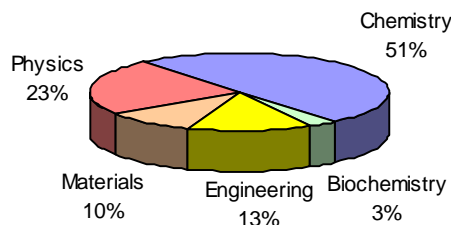


Figure 5  
Loan Pool average user satisfaction marks

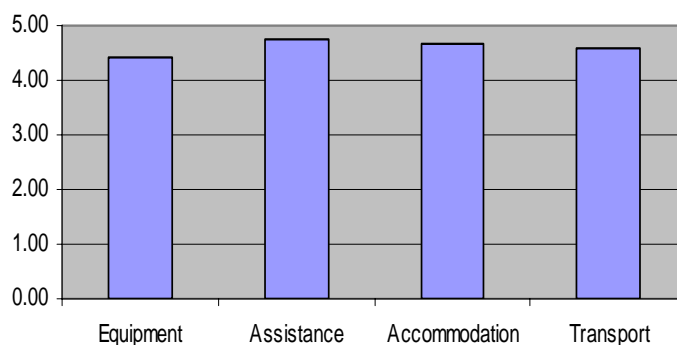


Table 1. **DELIVERED LASERS for SCIENCE FACILITY RAL-BASED SCHEDULE 2004-05**

Date	Confocal Microscope Laboratory	Nanosecond Science Laboratory	Ultrafast Spectroscopy Laboratory
Mar 29	<b>C BAIN</b> (Oxford) CM3C1/04 Twin beam optical traps for measuring interactions between oil droplets	<b>MAINTENANCE</b>	<b>MAINTENANCE</b>
April 5		<b>R EASON</b> (Southampton) NL1P1/04 Light induced domain engineering in ferroelectrics: A route to sub-micron poling	<b>K REID</b> (Nottingham) US6C1/04 Dynamical studies using an Imaging photoelectron spectrometer
April 12		<b>A BEEBY</b> (Durham) NL12C1/04 Ultrafast studies of intramolecular charge transfer in extended systems.	
April 19	<b>C BAIN</b> (Oxford) CM3C1/04 Twin beam optical traps for measuring interactions between oil droplets		
April 26			<b>TR<sup>3</sup> SET UP</b>
May 3	<b>MAINTENANCE</b>	<b>A WARD</b> (RAL) NL8B1/04 A detailed in-situ investigation of individual yeast cells using Raman tweezers	<b>J McGARVEY</b> (QUB) US5C1/04 Unusual photophysics & initial vibrational energy relaxation in Ru-Polypyridyl complexes
May 10		<b>W FISCHER</b> (Oxford) NL6P1/04 Structural analysis of viral membrane proteins using Raman spectroscopy	
May 17	<b>R BISBY</b> (Salford) CM9B1/04 Hyperluminescence of biomolecules on multiphoton excitation	<b>D BARLOW</b> (London) NL14B1/04 Raman spectroscopy of optically trapped drug & gene systems	<b>S MEECH</b> (Norwich) US12B1/04 Time resolved vibrational spectroscopy of green fluorescent protein
May 24			<b>W E SMITH</b> (Strathclyde) US15C1/04 Nanoparticle biological detection system
May 31			<b>N STONE</b> (Gloucester) US13M1/04 Enhanced tissue Raman spectroscopy with Kerr-gating technology
June 7	<b>INSTRUMENT DEVELOPMENT</b> (MRC/CCLRC)	<b>MAINTENANCE</b>	
June 14		<b>W FISCHER</b> (Oxford) NL6P1/04 Structural analysis of viral membrane proteins using Raman spectroscopy	
June 21	<b>MAINTENANCE</b>	<b>M KING</b> (Surrey) NL15C1/04 Oxidation of organic films on atmospheric aerosols	<b>A GOODSHIP</b> (RVC) US1B1/04 Transcutaneous Raman photon migration of bone tissue
June 28			
July 5	<b>J REID</b> (Birmingham) CM8C1/04 Probing aerosol dynamics by interfacing optical tweezing with cavity enhanced droplet spectroscopy	<b>P JAYCOCK</b> (Loughborough) NL9B1/04 Determining the biomechanical properties of the cornea	<b>SET UP TO IR</b>
July 12			<b>A VLCEK</b> (London) US8C1/04
July 19			<b>M GEORGE</b> (Nottingham) US7C1/04 Probing DNA damage by direct photoionisation with infrared detection
July 26			
Aug 2	<b>MAINTENANCE</b>	<b>J WEINSTEIN</b> (Nottingham) NL3C1/04 The structure & energetics of three- electron bonded aryl disulfide radical anions	<b>S MEECH</b> (Norwich) US12B1/04 Time resolved vibrational spectroscopy of green fluorescent protein
Aug 9			
Aug 16	<b>A WARD</b> (RAL) CM5P1/04 The application of white light continuum generation to laser microscopy	<b>P ROACH</b> (Southampton) NL5C1/04 Resonance Raman studies of Fe-S cluster containing enzymes	<b>A VLCEK</b> (London) US8C1/04 Early photochemical dynamics of charge transfer excited organometallic complexes
Aug 23			
Aug 30		<b>MAINTENANCE</b>	<b>MAINTENANCE</b>
Sept 6		<b>P MATOUSEK</b> (RAL) NL4C1/04 Raman atomic force nanospectroscopy	<b>'WELL FOUND LAB' UPGRADE</b>
Sept 13			<b>M WARD</b> (Sheffield) US4C1/04 Solvent-based switching of photophysical properties of polynuclear complexes
Sept 20	<b>INSTRUMENT DEVELOPMENT</b> (MRC/CCLRC)		

Date	Confocal Microscope Laboratory		Nanosecond Science Laboratory	Ultrafast Spectroscopy Laboratory
Sep 27	P O'NEILL (MRC) Facility Development			TR <sup>3</sup> Setup
Oct 4	MAINTENANCE		MAINTENANCE	S BARSBERG (Denmark) US24B2/04 Resonance Raman investigation of cell wall lignin radicals
Oct 11	S BOTCHWAY (RAL) CM11B2/04 Simultaneous determination of enzyme activity and location in cells using time-resolved anisotropy imaging		R BISBY (Salford) NL21B2/04 Time-Resolved resonance raman spectroscopy of intermediates from photolysis of 5-hydroxyindoles	
Oct 18				
Oct 25	C BAIN (Oxford) CM3C1/04 Twin beam optical traps for measuring interactions between oil droplets			P MOJZES (Czech Republic) US28B2/04 Picosecond time-resolved resonance Raman study of binding modes of novel cationic porphyrin designed for antisense oligonucleotide delivery to cancerous cells
Nov 1	LSF USER MEETING			
Nov 8	MAINTENANCE			J WEINSTEIN (Nottingham) US35C2/04 Structure of charge-separated excited state of metal thiolates
Nov 15	A WARD (RAL) CM5P1/04 The application of white light continuum generation to laser microscopy			
Nov 22	J WILLIAMS (Durham) CM13C2/04 New highly luminescent platinum(II) chromophores: Two-photon excitation for cellular imaging and sensors		J SANDERSON (Durham) CM20C2/04 Improved Raman tweezing methods for studying liposomes	IR Setup
Nov 29			UHV INSTALLATION	S MEECH (Norwich) US31B2/04 Time resolved infrared spectroscopy of the green fluorescent protein
Dec 6				
Dec 13	MAINTENANCE			J SANDERSON CM20C2/04 J REID (Bristol) CM16C2/04 Growth and coagulation of organic and aqueous aerosols studied by cavity enhanced droplet spectroscopy
Dec 20	CHRISTMAS & NEW YEAR			
Dec 27				
Jan 3			A BEEBY (Durham) NL20C2/04 Triplet states of molecular wires	MAINTENANCE
Jan 10	S BOTCHWAY (RAL) CM11B2/04 Simultaneous determination of enzyme activity and location in cells using time-resolved anisotropy imaging			J VAN THOR (Oxford) US22B2/04 Early structural events in the fluorescence cycle of green fluorescent protein
Jan 17			C NEYLON (Southampton) Resonance Raman studies of 4-thiothymidine containing DNA NL18B2/04	M WARD (Sheffield) US32C2/04 Solvent-based switching of photoinduced electron transfer in polynuclear complexes
Jan 24				A VLCEK (London) US25C2/04 Ultrafast ligand oxidation
Jan 31	K THOMPSON (London) CM23C2/04 Oxidation of hydrophobic particles in the atmosphere: effects on size and scattering properties		MAINTENANCE	M GEORGE (Nottingham) US33C2/04 Time-resolved infrared spectroscopy in supercritical fluids: C-H activation, spin changes in organometallic chemistry and dynamics of biopolymers
Feb 7				
Feb 14			M McCOUSTRA (Nottingham) NL22C2/04 Ultraviolet resonance Raman studies of adsorbates on metal surfaces	
Feb 21	S KRAUSE (London) CM10M2/04 High-resolution impedance imaging for materials characterisation and life sciences applications			M TOWRIE (RAL) Ultrafast TRIR for New Photochemical studies in the solid state US36C2/04
Feb 28				
Mar 7			MAINTENANCE	
Mar 14	P O'NEILL (MRC) Characterisation of DNA damage.	M KING (RHUL) CM15C2/04 Is photocatalysis a mechanism operating in atmospheric mineral aerosol	P ROACH (Southampton) NL17B2/04 Resonance Raman spectroscopy of Fe-S cluster containing enzymes	M TOWRIE (RAL) US37T2/04 A novel near IR time-resolved absorption spectrometer
Mar 21				

Table 2. DELIVERED LASERS for SCIENCE FACILITY LOAN POOL SCHEDULE 2004-05

Date	NSL1 POWERLITE /SIRAH+DFG	NSL2 SURELITE III-10/SIRAH	NSL3 SURELITE III- 10/SIRAH	NSL4 YAG/Dye POWERLITE /SIRAH +SHG	NSL5 YAG/Dye SIRAH + SHG		UFL1 COHERENT VERDI/MIRA + SHG +THG	UFL2 COHERENT LIBRA OPerA + OPA	CWL1 FREQUENCY DOUBLED ARGON ION
Mar 29	<b>FIELDING</b>	<b>JAYCOCK</b>	<b>ATTEN-</b>	<b>VOLK</b>	<b>SIMONS</b>	<b>PILLING</b>	<b>TAYLOR</b>		
Apr 5	(UCL)	(Loughborough)	<b>BOROUGH</b>	(Liverpool)	(Oxford)	(Leeds)	(Oxford)		
12	Dynamics of	Determining	(Hull)		LP25P2/03	LP38C203		<b>INSTALL-</b>	<b>WITHNALL</b>
19	electronic and	the		Fast			Ultraviolet	<b>ATION</b>	
26	nuclear	biomechanical	Laboratory	processes			resonance	<b>And</b>	(Greenwich)
May 3	wave	properties of	simulation	of alpha-			Raman	<b>COMMIS-</b>	
10	packets: A	the cornea	Of	helix			studies of	<b>SIONING</b>	Detection and
17	spectroscopic	LP18B2/03	acoustic	folding	<b>PILLING</b>		adsorbates	<b>OF NEW</b>	measurement
24	analysis of		shock				on	<b>LASER</b>	of visible
31	wave packet		waves		(Leeds)		metal	<b>SYSTEM</b>	emissions
Jun 7	composition				LP24C2/03		surfaces		from
14	LP27C2/03		LP22E2/03			Atmospheric			nanocrystalline
21						reactions of OH			phosphors
28						with			under
July 5	<b>FIELDING</b>			<b>ATTEN-</b>					ultraviolet
12	(UCL)			<b>BOROUGH</b>	<b>VOLK</b>				excitation
19									
26			<b>SIMONS</b>	(Hull)	(Liverpool)				
Aug 2	Femtosecond						LP29P2/03		LP23M2/03
9	and	(Oxford)						<b>STANTON</b>	
16	attosecond				LP10C1/04				
23	dynamics		Applications	Fast				(Nottingham)	
30		Infra- red	of	processes					
Sept 6		spectroscopy	laser-	of alpha-					
13		of	generated	helix				Investigation	<b>WITHNALL</b>
20		protonated	acoustic	folding				of	
27	LP9C1/04	neuro	shock					strain soliton	(Greenwich)
Oct 4		transmitters	waves in air					formation	Quantum
11						<b>SONES</b>		and	cutting
18					LP7C1/04			propagation	In
25									oxysulfide
Nov 1			LP6E1/04		(Southampton)				phosphors
8									bases
15		LP2C1/04				Light			doped with
22						induced			rare earth
29			<b>ATTEN -</b>	<b>VOLK</b>		engineering	<b>BOOTH</b>	LP8P1/04	cations
Dec 6			<b>BOROUGH</b>			domain	(Oxford)		
13	<b>WRIGHT</b>			(Liverpool)		in: A			LP11M1/04
20		<b>SIMONS</b>	(Hull)			ferroelectrics	Adaptive optics		
27	(Nottingham)			Fast		route to	for two-photon		
Jan 3		(Oxford)	Applications	processes		submicron	microscopy and		<b>WITHNALL</b>
10	Two-colour		of	of		poling	multi-layer		(Greenwich)
17	spectroscopy	The	laser-	alpha-			optical data		
24	in	common	generated	helix			storage		Studies of UV
31	molecular	core of N	gcooustic	folding	LP13P2/04			<b>SEDDON</b>	simulated
Feb 7	beams	-linked	shock					(Daresbury)	luminescence
14	and helium	glycans:	waves in				LP15E2/04	Spin	from
21	droplets	Rigidity	air	LP9C2/04				polarised	phosphors
28		through						spectroscopy	of
Mar 7	LP11C2/04	branching?	LP12E2/04					at the fermi	commercial
14								edge	importance
21		LP7C2/04						of NI (110)	
28								LP6P2/04	LP16M2/04