

## LSF Operational Statistics

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### RAL-based experiments

In the reporting period (March 2005 to March 2006), 26 different User groups performed a total of 54 experiments in the LSF laboratories at RAL. A total of 4313 hours laser time was scheduled to the UK User community and European Users throughout the year. 4994 hours were delivered with only 46 hours downtime. This year saw an increase in the number of weeks chemistry and decrease in biochemistry 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 28 publications, 9 conference proceedings and 4 PhD theses published during the reporting year.

### Loan Pool

The Loan Pool delivered 382 weeks of laser time in the reporting period. Downtime was 14 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 45% of allocated time. The breakdown is shown in Figures 4 and 5. The Loan Pool schedule is shown in Table 2. The average User satisfaction marks are shown in Figure 6. There were a total of 20 publications, 11 conference proceedings and 2 PhD theses published during the reporting year.

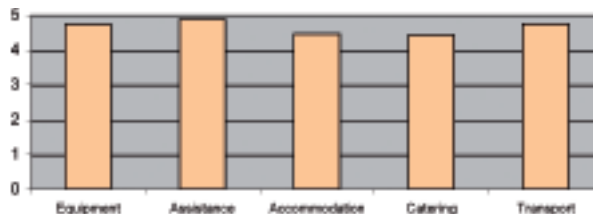


Figure 3. LSF average user satisfaction marks

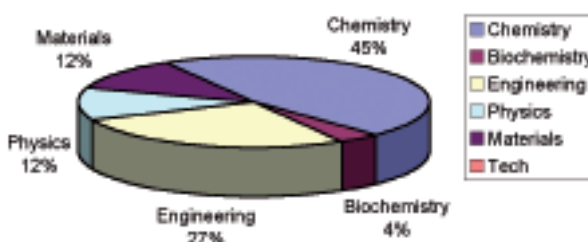


Figure 4. Loan Pool bids by subject group.

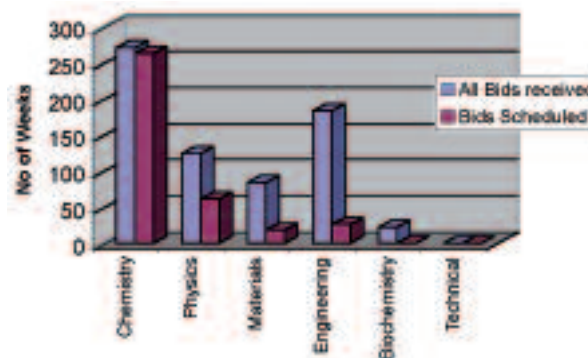


Figure 5. Bids received and scheduled by subject.

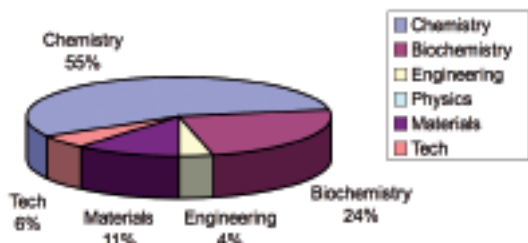


Figure 1. LSF based bids by subject group.

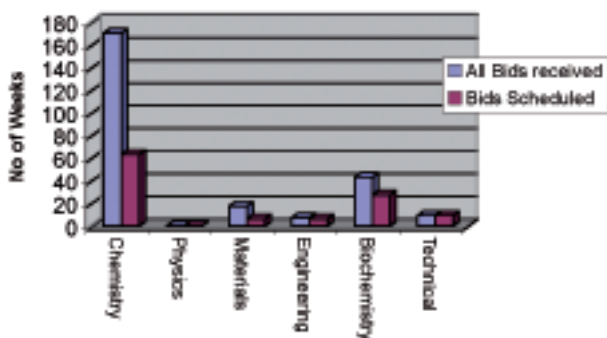


Figure 2. LSF based experiments by subject.

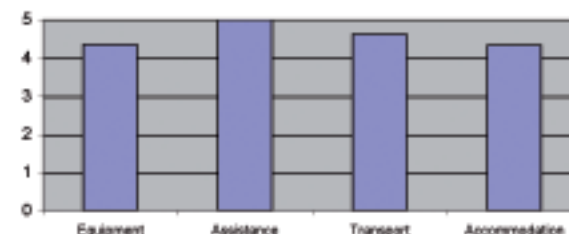


Figure 6. Loan Pool average user satisfaction marks.

Table 1. Lasers for Science Facility RAL-based Schedule 2005-2006

Date	Confocal Microscopy / Laser Tweezers Laboratory		Nanosecond Science Laboratory	Ultrafast Spectroscopy Laboratory
Mar 28			COMMERCIAL	MAINTENANCE
April 4			COMMERCIAL	IR SETUP
April 11	MAINTENANCE		J CAIRNS (Dundee) NL4B1/05 UV – induced decomposition and interrogation of novel metal – precursor films	M GEORGE (Nottingham) US9B1/05 Time-resolved infrared spectroscopy monitoring damage of DNA and DNA bases
April 18	R BISBY (Salford) CM3B1/05 Hyperluminescence from serotonin within mammalian cells	W FISCHER (Oxford) NL3M1/05 Spectroscopic characterisation of viral membrane proteins in vesicles	A BEEBY (Durham) NL20C2/04 Triplet states of molecular wires	FACILITY DEVELOPMENT SPIDER ALIGNMENT
April 25				
May 2			MAINTENANCE	J KELLY (Ireland) US27C2/04 Ultrafast processes in nucleic acids- The effect of DNA structure
May 9	J REID (Bristol) CM1C1/05 Manipulation of arrays of aerosol droplets		FACILITY DEVELOPMENT M MCCOUSTRA (Nottingham) NL1C1/05 New directions in surfaces science utilising laser-based techniques	A VLCEK (QML) US1C1/05 Ultrafast relaxation and electron-transfer dynamics
May 16	J REID (Bristol) CM1C1/05	P O'NEILL (MRC) CM8B1/05		J THOMAS (Sheffield) US2B1/05 Photophysical studies on novel DNA light switches
May 23	P O'NEILL (MRC) CM8B1/05 Characterisation of DNA damage – relation to DNA ionisation			M WARD (Sheffield) US10C1/05 conformational control in bichromophoric systems
May 30	MAINTENANCE			
June 6	C BAIN (Oxford) CM5C1/05 Deformation of oil drops with ultralow interfacial tensions in an optical trap		MAINTENANCE	F HARTL (Amsterdam) US23C2/04 TRIR spectroscopy of manganese carbonyls
June 13			J WEINSTEIN (Nottingham) NL8C1/05 Structure of radical anions of metal thiolates	J VAN THOR (Oxford) US8B1/05 Early structural events in the fluorescence cycle of GFP
June 20			J WEINSTEIN (Nottingham) NL6C1/05 The structure and energetics of three-electron bonded aryl disulfide radical anions: the feasibility transient absorption study	
June 27	J REID (Bristol) CM1C1/05 Manipulation of arrays of aerosol droplets			
July 4			COMMERCIAL	M GEORGE (Nottingham) US9B1/05 Time-resolved infrared spectroscopy monitoring damage of DNA and DNA bases
July 11	C BAIN (Oxford) CM5C1/05 Deformation of oil drops with ultralow interfacial tensions in an optical trap			M WARD (Sheffield) US10C1/05 Solvent-based conformational control of photoinduced electron and energy transfer in bichromophoric systems
July 18				
July 25				
Aug 1	FACILITY DEVELOPMENT B STEVENS (CMF, RAL) Ultrafast Laser Adlation		J WEINSTEIN (Nottingham) NL8C1/05 Structure of radical anions of metal thiolates	A VLCEK (QML) US1C1/05 Ultrafast relaxation and electron-transfer dynamics
Aug 8			E DRAPER (RVC) US11M1/05 Raman spectroscopy of bone through living tissue	TR <sup>3</sup> SETUP
Aug 15				J THOMAS (Sheffield) US2B1/05 Photophysical studies on novel DNA light switches
Aug 22			MAINTENANCE	P MATOUSEK (RAL) US3T1/05 Developing picosecond Raman photon migration as an analytical tool
Aug 29	MAINTENANCE		FACILITY DEVELOPMENT M MCCOUSTRA (Nottingham) NL1C1/05 New directions in surfaces science utilising laser-based techniques	MAINTENANCE
Sept 5	P O'NEILL (MRC) CM8B1/05 Characterisation of DNA damage – relation to DNA ionisation			P MATOUSEK (RAL) US3T1/05 Developing picosecond Raman photon migration as an analytical tool
Sept 12				
Sept 19				E DRAPER (RVC) US11M1/05 Raman spectroscopy of bone through living tissue

Table 1. Lasers for Science Facility RAL-based Schedule 2005-2006 (continued)

Date	Confocal Microscopy / Laser Tweezers Laboratory	Nanosecond Science Laboratory	Ultrafast Spectroscopy Laboratory	
Sept 26	MAINTENANCE	MAINTENANCE	IR SETUP	
Oct 3	MAINTENANCE	MAINTENANCE	R PERUTZ (York) US17C2/05 Transient infrared and emission spectroscopy of selective ion-sensors	
Oct 10			P LOW (Durham) US16C2/05 ps-TRIR studies of transition metal complexes featuring the unusual cyanoacetylide ligand	
Oct 17	M KING (RHUL) CM11E2/05 Probing the surface chemistry of optically levitated mineral particulates			
Oct 24		MAINTENANCE	S MEECH (UEA) US13B2/05 Controlling the proton transfer step in GFP	
Oct 31	P O'NEILL (MRC) CM13B2/05 Dynamics of assembly of repair proteins to genomic DNA damage	FACILITY DEVELOPMENT M McCOUSTRA (Nottingham)	P LOW (Durham) US16C2/05	
Nov 7	G WILLIAMS (Durham) CM10C2/05 Time-resolved luminescence imaging			
Nov 14	B STEVENS (CMF, RAL)      M KING CM11E2/05			A VLCEK (QML) US14C2/05 Acceleration of electron transfer in RE complexes with aminoacids
Nov 21		M McCOUSTRA (Nottingham) NL12C2/05 Photon-induced processes in model interstellar ices	TR <sup>3</sup> SETUP	
Nov 28				
Dec 5	R PERUTZ (York) CM9C2/05 Transient infrared and emission spectroscopy of selective ion-sensors			N STONE (Cranfield) US15C2/05 Evaluating the potential of Kerr-gated Raman spectroscopy to probe breast calcification biochemistry through soft tissue
Dec 12				
Dec 19	Christmas & New Year 2005			
Dec 28				
Jan 2	MAINTENANCE	PROVISIONAL A HORN (Manchester) NL13C2/05 Sum frequency generation studies on the RAL-LSF UHV system	N STONE (Cranfield) US15C2/05	
Jan 9	W HUANG (Oxford) CM14E2/05 Using Raman tweezers to analyse and sort <sup>13</sup> C-labelled bacteria		K REID (Nottingham) US12C2/05 Studies of mechanisms of intramolecular vibrational dynamics using time resolved photoelectron spectroscopy	
Jan 16				
Jan 23	FACILITY DEVELOPMENT B STEVENS (CMF, RAL)			
Jan 30	P O'NEILL (MRC) CM13B2/05			IR SETUP
Feb 6	W HUANG (Oxford) CM14E2/05			J VAN THOR (Oxford) US19B2/05 Picosecond transient infrared spectroscopy of chromoproteins
Feb 13	G WILLIAMS (Durham) CM10C2/05 Time-resolved luminescence imaging			
Feb 20				A VLCEK (QML) US14C2/05
Feb 27	R BISBY (Salford) CM12B2/05 Serotonin hyperluminescence in biological microenvironments			S MEECH (UEA) US13B2/05
Mar 6				
Mar 13			M TOWRIE (RAL) US23T2/05 Full commissioning of a novel near IR time resolved absorption spectrometer	
Mar 20	P O'NEILL (MRC) CM13B2/05			

Table 2. Lasers for Science Facility Loan Pool Schedule 2005-2006

Date	NSL1 YAG/Dye Powerlite + Sirah + SHG + DFG	NSL2 Compact YAG/Dye Surelite III- 10 + Sirah + SHG	NSL3 Compact YAG/Dye Surelite III- 10 + Sirah + SHG	NSL4 YAG/Dye Powerlite + Sirah + SHG	NSL5 YAG/Dye Spectra Pro + Sirah + SHG	UFL1 Coherent Verdi/Mira + SHG +THG	UFL2 Coherent Libra OPerA Ultrafast Amp + OPA	CWL1 Frequency Doubled Argon Ion
Mar 28		<b>SIMONS</b>		<b>GHANDI</b> (ISIS) Laser Control of Muonium Reactions LP5C1/04		<b>BOOTH</b> (Oxford) LP15E2/04		<b>WITHNALL</b> LP16M2/04
Apr 4								
Apr 11								
Apr 18								
Apr 25					<b>SONES</b> (S'hampton)		<b>SEDDON</b> (Daresbury)	
May 2							Spin polarised Spectroscopy at the fermi edge Of NI (110)	
May 9	<b>WRIGHT</b> (Nottingham)							
May 16								
May 23		<b>SIMONS</b> (Oxford)	<b>BROUARD</b> (Oxford)					
May 30								
June 6								
June 13								
June 20	Two-colour spectroscopy in molecular beams and helium droplets		Faraday rotation: A novel probe of molecular dynamics		Light induced domain engineering in ferroelectrics. A route to submicron poling		LP6P1/04	
June 27		The common core of N-linked glycans: Rigidity through branching?						<b>POLIAKOFF</b> (Nottingham)
July 4								
July 11								
July 18								
July 25				Development of an optical imaging system for pressure and temperature mapping of aerodynamic flows		Ultrafast fluorescence up – conversion for chromo – proteins and complex fluids		
Aug 1	LP7C1/05		LP6C1/05		LP13P2/04			UV Raman Process Monitoring of Reactions in Supercritical Water
Aug 8								
Aug 15								
Aug 22		LP7C2/04				LP3C1/05		
Aug 29								
Sep 5								
Sep 12				LP2E1/05			<b>STANTON</b> (Nottingham)	LP13C1/05
Sep 19								
Sep 26								
Oct 3							Detection of picosecond ultrasound by nano- structures	
Oct 10								
Oct 17								
Oct 24								
Oct 31					<b>WEINSTEIN</b> (Sheffield)			
Nov 7			<b>BROUARD</b> (Oxford)					
Nov 14							LP14C1/05	
Nov 21	<b>WRIGHT</b> (Nottingham)	<b>SIMONS</b> (Oxford)		<b>ROURKE</b> (Warwick)	Resonance Raman insight into electronic properties of metal chromo- phores: combining (spectro) electro- chemistry, isotopic substitution and cycto- metallation to controlling charge separation			
Nov 28								
Dec 5	Two-colour spectroscopy in molecular beams and helium droplets	Infra-red photo- dissociation of protonated amino-acids and peptides in the gas- phase	Faraday rotation: A novel probe of molecular dynamics					
Dec 12						<b>CAVILL</b> (DLS)		
Dec 19								
Dec 26								
Jan 2	LP21C2/05		LP17C2/05					<b>EASUN</b> (S'hampton)
Jan 9								
Jan 16								
Jan 23		LP18C2/05						
Jan 30								
Feb 6								
Feb 13								
Feb 20				LP22C2/05		LP19P2/05		
Feb 27								
Mar 6					LP25P2/05		<b>PROVISIONAL</b>  <b>HORN</b> (Manchester)  Sum frequency generation studies on the RAL-LSF UHV system	LP28M2/05
Mar 13								
Mar 20							LP26C2/05	