Internal Management

Technical Support and Research Services

The capacity of the School to undertake leading-edge research is underpinned by highly skilled technical staff, whose skills and expertise complement those of the academic staff.

Technical Support

The output of experimental groups in the RSC is supported by technical staff attached to individual groups. Their broad technical expertise is enhanced by additional specialist knowledge and skills in areas of direct relevance to the research group. Technical staff provide continuity within particular groups, but their expertise is also made available to other groups. The technical staff contribute to the research projects of their groups and this is acknowledged by co-authorship of publications. In addition, the technical staff assist the Laboratory Manager in implementing and monitoring safety policy within the groups.

ANU Microanalytical Services Unit

V. L. Withers≈, A. Melnitchenko

During 2003, the Unit completed a total of 2030 analyses on 1298 samples submitted by 185 individuals, most of which (76%) were CHN analyses. External requests for analyses now constitute 66% of the total. Universities (Newcastle, New South Wales, Sydney, New England, Western Australia, Wollongong, Western Sydney Macarthur Campus, James Cook Townsville Campus, Deakin and Griffith, Curtin, South Australia as well as University of Technology, Sydney, Australian Defence Forces Academy, and Sydney Grammar School) constituted 37% of requests, with significant requests coming from Commercial (25%) and Governmental (4%) sources. The commercial and Government clients mainly came from the Research and Development sections of Pharmaceutical Companies (Institute of Drug Technology , CSIRO [Division of Molecular Science], Progen Industries, Biotron, Access Pharmaceuticals, Prana Biotechnology and Parnell Laboratories) and samples were also received from Geoscience Australia and the Victorian and South Australian Museums.

External earnings for 2003 were $70,690.00

Reet Bergman retired after many years service to the unit, both in the RSC and, before that, in JCSMR. Her expertise has been valued and we are gratedful that she willingly continues to advise on the operation of the instruments whenever called upon.

During the year Viki Withers and Sasha Melnitchenko attended a 1-day course on flame AAS.

Viki Withers is a member of the RSC Advisory Committee on Safety.

The web site for the Unit is *http://rsc.anu.edu.au/facilities/micro.php*. Details of instrumental techniques used and submission of samples can be found on this site.

≈ *Part-time [relates to hours worked in a unit]*

Computer Unit

The computer unit provides support for the diverse range of software and hardware used in the School. The School has 45 Unix workstations (Linux, SGI and Sun), which are the main computational units within the School and 130 Apple Macintosh computers, which are the desktop systems for most staff and students. In addition, 70 PCs running Microsoft Windows are used for controlling experimental and data collection equipment.

Printing services are provided by twenty laser printers and three Fuji-Xerox colour thermal wax printers.

The School main servers now run Linux. One is used to provide external services including such things as the School's e-mail and web services. Another one provides many internal services such as authentication and file-serving, whilst another is used for small to medium sized computational tasks.
The major hardware acquisitions this year have been of Apple Macintosh Dual G5, Dual G4, Emac, iMac, ibook, G4 Laptop as well as one Sun Workstation and approximately ten new PCs running either or both of Linux and various versions of Microsoft Windows.
We keep a "mirror" copy of the file systems on the School's main servers on a server in a different building as well as removable disk backups of these file systems.
The School's web page is administered by Chris Blake, and can be found at:
http://rsc.anu.edu.au. *(P.R. Cohen, C.D. Delfs, R. Faletic, G.A. Lindsell)*

Single Crystal X-ray Diffraction Unit

The unit performs crystal structure analyses on samples provided by various groups within the RSC. Some of the structures now being solved and refined have as many as 400 non-hydrogen atoms and so are similar in size to small proteins. X-ray diffraction data sets are collected on a Nonius Kappa-CCD area-detector diffractometer equipped with IFG capillary X-ray-focusing collimators and an Oxford Cryosystems crystal cooling device. During the year the Cryostream dry-air unit and nitrogen pump were replaced by the latest models which are much quieter and operate more efficiently. Data sets were also collected for other members of the RSC to solve and refine. Several structures needed to be refined in non-standard ways to allow for twinning, stacking faults and composite space groups and these were done in collaboration with Professor David Rae.

In total, 177 data sets were collected and 116 final reports produced for the year. External work was performed for the Australian Defence Force Academy, CSIRO Division of Entomology, and RMIT University. *(A.J. Edwards, A.C. Willis)*

Group	Data Sets Collected	Reports Completed
RSC	156	105
Others (ANU)	15	9
Others (External)	6	2
TOTAL	**177**	**116**

Internal Management

Mass Spectrometry Service

High resolution mass spectrometer for MS(n) chemical characterisation. **Australian Research Council, Linkage Infrastructure, Equipment and Facilities, January 2003 – December 2003. Visit the Mass Spectrometry website for more information at http://rsc.anu.edu.au/facilities/mass.php

University NMR Centre

Nuclear Magnetic Resonance (NMR) has applications in all fields of the experimental sciences. NMR is the single most important technique available to chemists on campus and it is an important supplementary technique for many of the natural and life sciences including biological chemistry, macromolecular and surface science, medicine and physics.

In this past year, the ARC awarded the largest single Linkage-Infrastructure grant to a consortium of Universities including the ANU for the purchase of an 800 MHz NMR spectrometer and a cryoprobe. To be installed in early 2004, it will be the most sophisticated and highest field (18.8 Tesla) NMR spectrometer in Australia. The new spectrometer will join six others operating at field strengths between 4.7 and 14.1 Tesla at the University NMR Centre and catering for over 100 staff and students in six Schools and Faculties. A wide range of probes and other equipment associated with the NMR spectrometers makes the NMR Centre at the ANU the most advanced in Australia. Visit the NMR website at http://bloch.anu.edu.au/

Research Services

Staff of the section provided expert advice on the design, manufacture, maintenance and refurbishment of equipment to the academic and research staff
of the School, the ANU and the broader community. The primary focus of this section is the support of RSC research and teaching programmes.

Carpentry and Paint Workshops

These workshops are well equipped with carpentry and joinery machinery and spray painting facilities, and provide outstanding custom furniture and fittings for the School's laboratories and offices, in addition to specialised scientific apparatus and specialised surface finishes to engineering materials of all workshop sections. Major projects for this year included refurbishment of several offices and laboratories plus a seminar room. In addition preparative work commenced for the installation of a major piece of equipment scheduled for early 2004. *(I.J. Clarke, R.J. O'Brien)*

Cryogenics Unit

This unit provides cryogens, liquid nitrogen and helium, to the School and the wider ANU community (Department of Chemistry. The Faculties, Research School of Astronomy & Astrophysics (Stromlo Observatory), RSES, and CSIRO). *(P. Devitt, R. J. O'Brien)*

Electrical Unit

This unit provides services in electrical wiring and modifications, new equipment verification and installation, maintenance of electrical research and plant equipment. The mandatory electrical safety checking of appliances throughout the School is co-ordinated by staff in this unit. *(M. Bush (to 24/5/03), R.J. O'Brien)*

Electronics Unit

This unit is equipped with design, development, and construction facilities, including specialised services for computer-aided design and PCB manufacture. In addition electronic repair services are provided for the research groups within the School and the instrumentation service units, such as the *Mass Spectrometry* unit, in preference to using external service engineers. *(R.T. Koehne, D. Lu (to 23/8/03)*

Glassblowing Unit

Staff in this unit provide expertise and resources for the design, construction and repair of glass apparatus, together with advice on any aspect of construction, materials, or safety. Throughout 2003 the unit continued to provide an impeccable service to research programs within the RSC and the wider ANU community, as well as undertaking work for external clients. (*P. Siu, C.J. Tomkins)*

Mechanical Workshops

This main workshop is equipped with precision engineering capabilities for instrument development (e.g., precision milling, turning, and welding), mechanical maintenance and repair, and the design and manufacture of prototype apparatus in metal or plastic.

In support of all laboratory research programmes, extensive maintenance, repair and fabrication services were provided by the workshop. Installation of services (gas, water, vacuum, equipment racks) associated with fume-cupboard and laboratory upgrades continued, together with support of the environmental program to convert instrument cooling systems reliant on mains water to recirculating chilled water systems. The workshop also continued to provide support to the wider ANU community, such as the Facilities and Services Division zone-3 maintenance section.

The mechanical prototype workshop provides mechanical engineering services, prototypes of advanced scientific instrumentation, high vacuum, cryostat, and helium leak detection services to the School. *(P. Devitt, R. Filardo, M.J. Hill, K.L Jackman, R.J. O'Brien, D.C. Pepper)*