La Trobe Chemistry: The First 50 Years*

*In association with La Trobe 50th Anniversary celebrations

By Bob Brownlee r.brownlee@latrobe.edu.au

and

John Hill jce.hill@bigpond.com

(Both authors joined La Trobe Chemistry as Research Fellows in 1970 and both were awarded Emeritus Professorships on retirement)

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[1] r.brownlee@latrobe.edu.au [2] jce.hill@bigpond.com

FOREWORD

Our preliminary research revealed that no definitive history of the La Trobe Chemistry Department had been written previously and much of the essential documentation relating to departmental structures and teaching programmes from foundation to the end of the 1980's had been 'lost'. Hence this document has relied substantially on input from our colleagues and on our collective memories of key events, critical developments and the consequences of continuous climatic changes (both financial and infrastructural) within the University framework which have crucially affected both staff and students over five decades. We have attempted to recall the history of the Department as accurately as possible based on the information and limited historical documentation available to us. In addition, we have attempted to give a balanced summary of the achievements of all members of the academic staff and overall we have emphasized the 'positives' and discussed the 'negatives' in terms of how the Department as a whole has dealt with these so as to continuously move forward. In addition, we have highlighted the career achievements of some of the Chemistry higher degree graduates, since we believe that these quantify the quality of the Department's outstanding teaching and learning profile throughout the fifty year period reviewed. Also, we have realistically estimated the total research funding quantum received by the Department and the total publication record so as to endorse its quality research profile. Overall, it is apparent that La Trobe Chemistry has a distinguished academic record to be proud of and based on this, it has established a secure platform on which to build a sustainable future.

OVERVIEW, INFRASTRUCTURE & RESOURCES PERSPECTIVE

The fundamental ethos of the University at foundation through to the present is a dedicated commitment to quality teaching and learning informed and enriched by research. In accordance with these guiding principles, chemistry academic appointments have consistently required a PhD as a primary qualification in conjunction with demonstrated teaching ability.

The first appointments in Chemistry in early 1966 were Ron Topsom (Professor), from the University of Canterbury, NZ, Bela Ternai (Research Fellow) and Arch Gallagher (Laboratory Manager). In early 1967, Bob Magee (Professor), from Queens University, Belfast, Bob Cattrall, Les Deady, Mike Davis, David Dale, John Kingston and John Mackie (Lecturers) followed and some of these staff were accommodated in rented offices in St. Kilda Road prior to

moving to the Bundoora campus in February 1967. At that stage, the academic staff consisted of the above plus Jim Morrison (Professor), who was previously a Principal Scientist at CSIRO (Fishermans Bend), Terry Cardwell (Lecturer), Roy Considine (Research Fellow), Graeme Butt (Research Associate) and Mike Blackmore, Sam Woodburn and Emelia Krankovits (Kaiser) (Senior Demonstrators) and George Greer (Technician). At this time, only two buildings existed on the new campus: Stage 1 of the Library (later named 'The Borchardt Library' after the foundation Chief Librarian, Dietrich Borchardt) and Stage 1 of Glenn College (named after the foundation Chancellor, Sir Archibald Glenn). The university administration at this time was accommodated in temporary 'prefab' buildings on the adjacent Plenty Road. Chemistry was a 'teaching area' within the School of Physical Sciences. Ron Topsom was Foundation Dean of the latter and he was one of four professors elected to the Interim Council of the University in 1966. From the beginning, 'Chemistry' was subdivided into three divisions: Inorganic, Organic and Physical Chemistry. Foundation staff were initially accommodated in Glenn College and in the Library – Level 2.

Initially in 1967, teaching (lecture rooms), laboratory teaching facilities, research laboratories and a temporary chemistry store were established on the ground floor of the Library and in the basement respectively. The Chemistry 1 teaching laboratories were later relocated on Level 3 of the Thomas Cherry Building and chemistry staff offices were also relocated to the TCB in 1968. During this period, additional academic staff including Neville Arthur, Trevor Broxton, Maureen Mackay, Graeme Nyberg, Max O'Connor, Barrie Peel and Jim Reiss (Lecturers), Mike Kendall (Research Fellow) and John Smith (Research Associate) as well as essential secretarial and technical staff were appointed: Denise Worthington (Secretary to Ron Topsom), Heather Mackay (Secretary to Bob Magee), Dianne Brown (Samson) (Secretary to Jim Morrison, Lynn Dawson (Secretary to Arch Gallagher) and Ray Loft, Greg Egan, Muriel Kelly (Laboratory Technicians). In 1969, Chemistry moved into the new Physical Sciences 3 (PS3) building – adjacent to the Borchardt Library. Organic Chemistry was located on Level 4, Inorganic Chemistry on Level 3 and Physical Chemistry on Level 2. Mechanical, Electronic and Glass workshops were also established since these were considered to be essential foundation support facilities for establishing research programs, particularly in Physical Chemistry, which at that time depended on 'equipment', which was not commercially available. The Mechanical Workshop was initially located in a factory in West Heidelberg and then in the 'dungeon' of PS3 and was managed by John Chippindall ('Chips') with Don Balaam as deputy: the Electronics Workshop was managed by George Haertel and the Glass Workshop (later renamed Glass Engineering) was managed by Alf Ramsden. Les Stafford was appointed as 'Artist & Photographer', who produced artwork for research papers and theses and produced slides for seminar presentations. A Chemistry Store was also established which was managed by Jim Kendrick. A delivery bay, adjacent to the Chemistry Store was provided to facilitate delivery of equipment and chemicals and for safe storage of gas cylinders. A staff/post-graduate common room (R138) was also established on the Ground Floor of PS3. In addition, 'Organic' had a specialist satellite library on Level 4 PS3 and levels 2 and 3 had seminar/tutorial rooms. A special feature of the master plan for PS3 was the adjacent research laboratory for each academic staff office which facilitated supervision of honours and higher degree students. By the end of the decade, several foundation academic staff had resigned: Mike Blackmore moved to the University of Newcastle, John Kingston moved to a UNESCO Chair in Chemistry at the University of Jordan in Amman, Sam Woodburn moved to Ballarat College of Advanced

Education, (now Federation University), Ray Considine moved to the University of Southern Queensland and John Mackie moved to the University of Sydney.

Thus, within a 5-year time frame from its inception, 'Chemistry' was well established as a foundation 'centre of excellence' in the nascent La Trobe University. This was the outcome of the 'grand vision' for its establishment that it would be comparable in status and stature to its corresponding predecessors in the State of Victoria - Melbourne and Monash Universities but that it would have distinguishing features in both its teaching and research profiles. A key premise of this vision was that all academic staff at the level of Research Fellow and above would have a PhD and be 'research active', thereby establishing a cohesive 'knowledge-based' culture within its confines. Equally important was that undergraduate courses would be enriched by an experimental component and that 'Honours' would be composed not only of conventional lecture courses but also of a minor thesis project, both of which would contribute to the overall assessment. By the end of the decade, La Trobe Chemistry had a full suite of BSc, BSc (Hons.), MSc (Prelim.) and PhD programmes in place and thus, its sustainability in terms of academic credibility, was assured.

In mid-1970, La Trobe Chemistry expanded physically to occupy Levels 3 (Inorganic) and 4 (Organic) of the new Physical Sciences 4 (PS4) Building, which was connected to PS3 by a Level 2 bridge. This provided additional offices, research and teaching laboratories commensurate with the rapid expansion of staff and rapid increase in student enrolments. Crucially, this new accommodation came with additional 'infrastructure funding' provided by the University which was used to appoint additional staff and to purchase specialised research equipment.

Academic staff additions in the 1970's included John Christie, Peter Derrick, Michael Grant and Tony Wedd (Lecturers), Bob Brownlee, John Hill, Bruce James, Tony Masters, John Traeger and R. Wilson (Research Fellows) and John Davy, Jeff Rowe and Shabbir Tariq (Senior Demonstrators). 5 Research Associates were also appointed on fixed-term contracts. David Dale resigned in 1974 and moved to the Technical University of PNG in Lae. Administrative/Technical Staff additions included Vanessa Paproth (Secretary to Ron Topsom), Dianne (Quigley) Brown, Barry Hodkinson (Year 1 Chemistry Laboratory Manager), Barbara Pleasance, Daryl Huntington and Terry Ryan.

In the late 1970's, the three Divisions of Chemistry became three Departments of Chemistry, each chaired by the respective (foundation) Professor of Chemistry who each took turns as 'Chairman of Examiners' and the 1970's decade overall witnessed La Trobe Chemistry develop into one of the largest chemistry departments in Australia. Undergraduate student numbers grew rapidly throughout the decade, academic staff numbers peaked around 28 and research programs flourished due to generous university research establishment grants and the award of numerous ARC grants. Record numbers of Higher Degree graduations resulted, many of whom excelled in their chosen careers. Also, many academic staff presented at national and international conferences in their areas of expertise and who were financially supported by the University as a means of highlighting its commitment to 'research-informed' teaching. This decade of 'golden age' progress by La Trobe Chemistry endorsed its 'firm foundations' origin.

In the early 1980's, the Department of Inorganic Chemistry was renamed the Department of Inorganic and Analytical Chemistry to reflect the equal emphasis of these two branches within its confines and, as an outcome of the Reid Report into University Governance,

the three Departments of Chemistry elected Heads of Department: Inorganic and Analytical, Michael Grant: Organic, Jim Reiss and Physical, Jim Morrison. In the mid 1980's, the three Departments of Chemistry coalesced into a single department with an elected HOD – the first of which was Jim Morrison. Bob Brownlee assumed this role in 1988. At this time, Fay Traianou was appointed secretary to the HOD.

During this decade, there were further academic staff additions: Anna Stragalinou (Lecturer), and Charles Young (Lecturer, promoted to Senior Lecturer in 1990) plus 11 Research Associates and 10 Research Fellows, the latter groups appointed on fixed-term appointments. Charles Shoppee, FRS and Sandy Mathieson, FRS were appointed Honorary Professors and Ian Hamilton and Geoff Scollary were appointed as Honorary Research Associates. Tony Masters moved to the University of Sydney (1980) and Peter Derrick resigned in 1984 to take up the Chair of Physical Chemistry at UNSW and later at Warwick University, UK. Sadly, Michael Grant and Max O'Connor died in 1984 and 1985 respectively. Bob Magee, Arch Gallagher, John Smith and Jim Morrison retired in 1986, 1986, 1988 and 1989 respectively. Additional/replacement secretarial/technical staff were appointed: Vanessa Paproth, Ros Wright, Margaret Richards, Colleen Duggan, Jean Brown, Graham Bratspies, Terry Paproth, Alan Jeffry, Debbie del Frate, Ian Potter, Cecile Vlastuin, John Mathews, Eric Goodwin, Frank Brogno, John Reukers, Mike Koppenol, Ian Shaw (d. 2017), David Annear, Ian Thomas and Jessie White (AV Technician).

Essentially, the 1980's were focused on consolidation of the successful teaching and research programmes of the previous decade, whilst prolonging the 'golden age growth syndrome' by introducing new specialist instrumentation, adding and expanding workshop facilities and capabilities and providing staff with desktop computers (the iconic Apple Macintosh), enacting OSP opportunities and providing financial support for national and international conference attendance. Throughout the decade, La Trobe Chemistry had a robust weekly seminar programme with internal and external speakers. In addition, higher degree students and honours students made contributions to the Departmental seminar programme. Many academic staff received promotion during this decade which further enhanced morale and a vibrant 'chemical society' contributed a significant social dimension to the La Trobe Chemistry community. The latter continued to be active over the subsequent three decades under the acronym 'LUCK' and has held many informal functions for the La Trobe Chemistry community throughout the academic year. Notable among these is the annual 'footy match' between 'chemistry' and 'biochemistry' and the 'Graduation Ball'. LUCK and its predecessors have always been a formidable 'bonding force' within the La Trobe chemistry fraternity and continues to be vigorously supported in its many and varied informal and entertaining activities.

In the early 1990's, the University was restructured with the establishment of five Faculties – Science, Technology and Engineering (FSTE), Law and Management (FLM), Humanities and Social Sciences (FHUSS), Health Sciences (FHS) and Education (FED). This had a major effect on all functions of the University, especially in terms of resources and infrastructure. Chemistry was incorporated into the School of Environmental Resources, along with Agriculture and Geology – within FSTE. The Foundation Dean of FSTE was David Kelly, formally from the University of Melbourne. The immediate effect of this restructure on La Trobe Chemistry was loss of office space in PS4 and laboratory space in PS3. In addition, severe financial constraints imposed on all Faculties/Departments resulted in loss of both academic and technical staff and new appointments were restricted or postponed. Barrie Peel was elected

HOD from 1990 to 1994, when the role was re-assumed by Bob Brownlee. New appointments in this decade included Alan Bond (Professor), Ray Colton, Andrew Hughes (Senior Lecturers) and Ian Potter (Lecturer) and the research strength of the Department was augmented by the appointment of 4 Research Associates and 17 Research Fellows, all on fixed-term appointments. Claude Culvenor (CSIRO) was appointed Honorary Professor. Movements included Tony Wedd, who was appointed a Professor of Chemistry at the University of Melbourne (1991) and Charles Young who was appointed Senior Lecturer in Chemistry at the University of Melbourne also in 1991. John Hill was seconded to the National University of Singapore (NUS) as a Senior Teaching Fellow in the Department of Chemistry (1990 to 1994) and was subsequently relocated to the Albury-Wodonga Campus in mid-1994 as Reader/Associate Professor in the Department of Environmental Management & Ecology. He subsequently became Head of that Department from 1997 to 2000. Alan Bond moved to the 'Ray Martin Chair of Chemistry' at Monash University in 1994. Mike Koppenol retired in 1997 and Ron Topsom, Bob Cattrall, Daryl Huntington (semi-retired) and Barrie Peel retired in 1999. Sadly, Mike Davis (1993), George Haertel (1993), Jim Kendrick (1995) and Charles Shoppee (1998) died during the decade.

Overall, the 1990's was a difficult and stressful decade for La Trobe Chemistry due to a combination of many factors which resulted in reduced morale. In particular, Chemistry was left without professorial leadership when Alan Bond departed in 1994 until Bob Cattrall was appointed to a Personal Chair in 1997. Further, the restructure of the University into five Faculties, resulted in the down-sizing or the elimination of many departments. In the case of FSTE, Geology was closed and in addition to Chemistry, Electronic Engineering, Genetics and Agriculture, suffered severe down-sizing with the consequential elimination of many well-established courses, including 'Chemical Sciences', 'Environmental Science' and 'Bioinformatics'. Also during this period, La Trobe Chemistry suffered further reductions in office, teaching and research laboratory space, resulting in reallocation of resources and closure of workshops. However, there was an increase in IT facilities to augment student learning.

Fortunately, after the 'recession' of the 1990's, the 2000's ushered in a decade of 'regeneration' with expectations of new horizons being established in teaching and research. Many of the 'first generation' of academic staff had resigned, moved or retired and the 'second generation' were appointed, all with well-established research records. These included Mark Hinds, Brian Smith (Federation Fellow Level D), Adam Mechler, Evan Robertson (Level C), Belinda Abbott, Peter Barnard, Jason Dutton, Conor Hogan, Anne Richards (Level B) and David Wilson (Level A). Mandeep Kaur was appointed at Level A in 2014 as 2nd and 3rd Year Laboratory Coordinator and Michelle Spencer was appointed as a contracted Level B lecturer in 2011. Seb Marcuccio was appointed Honorary Research Associate and Helen O'Hara was appointed Chemistry 1 coordinator. Three additional Research Fellows were appointed post 2000 on fixed-term contracts.

Retirements included Les Deady (2001), Terry Cardwell (2002), John Hill (2006), Bob Brownlee (2008) while Anne Richards and Andrew Hughes resigned in 2013 and 2014, respectively. Following his retirement in 2000, Shabbir Tariq accepted an Associate Professorship in the Department of Chemistry, University of Malaysia-Sabah, Kota Kinabalu. Sadly, Trevor Broxton (2002), Ron Topsom (2007), Bob Magee (2008), Bruce James (2009), Sandy Mathieson (2012), Jim Morrison (2013), John Christie (2014), Maureen Mackay (2014), John Kingston (2016) and Peter Derrick (2017) all died post 2000.

Thus, the first decade of the 21st century was a renaissance period for La Trobe Chemistry, due to the appointment of a new group of outstanding academic staff who established leading-edge research groups in topical/forefront areas, thus ensuring the future sustainability of the Department. Bob Brownlee continued as HOD to 2008 and was succeeded by Andrew Hughes (2009 – 10) and then Ian Potter to the end of 2014. At present, 15 academic staff and some 40 PhD students currently comprise La Trobe Chemistry, which is recognised as an emerging leader in the discipline nationally. Its leading-edge research has been recognised by the Commonwealth Government in the most recent ERA results with inorganic chemistry and medicinal chemistry being rated 'above world standard' and analytical chemistry being rated 'well above world standard'. Overall, La Trobe Chemistry is currently rated 'above world standard'.

Excellence comes from not only high quality academic staff and higher degree students but also from the infrastructure which supports them. In 2013, Chemistry vacated PS3 and became an integral part of the new La Trobe Institute for Molecular Sciences (LIMS) accommodated in a purpose-built facility and occupied Level 6 with the Chemistry teaching laboratories located on Level 3. The LIMS complex is a state-of-the-art research hub, designed to facilitate collaboration between chemistry, biochemistry, genetics and molecular archaeology departments of the University as well as with external affiliated scientific organisations. Outstanding financial support of LIMS by the University has not only allowed state-of-the-art instrumentation and additional essential equipment to be purchased outright but internal funding has also been used to leverage significant additional external funding through programmes such as ARC LIEF grants. The incorporation of La Trobe Chemistry into LIMS is recognised as the catalyst of its current renaissance and resurgence.

It should be noted that PS3 was subsequently 'gutted' and restructured as 'The Learning Commons' (TLC building) and is an ultra-modern state-of-the-art Teaching and Learning Centre. Thus, the cradle and soul of La Trobe Chemistry, nurtured over some 45 years, was expunged and an era ended.

Over the period 2013 to 2015, the University was again restructured, whereby the five Faculties were 'absorbed' into two Colleges: 'Science, Health & Engineering' (CSHE) and 'Arts, Social Sciences & Commerce' (CASC). The Departments of Chemistry and Physics were merged and incorporated into the School of Molecular Sciences within CSHE. Brian Smith was appointed Professor and Head of the newly created Department of Chemistry and Physics from 2015. Subsequently in 2016, he was appointed Head of the School of Molecular Sciences and Narelle Brack from Physics became the new Head of the former department.

Many staff received honours during their career: Bob Magee (Edinburgh), Jim Morrison (Glasgow), Barrie Peel (Melbourne - 1984), Bob Cattrall (Adelaide – 1986), Terry Cardwell (Queens University Belfast – 1991), John Hill (London – 1992), Tony Wedd (Tasmania – 1997), Sandy Mathieson (Aberdeen – 1996), Charles Young (Melbourne – 2008) were awarded Higher Doctorate (DSc) degrees. Charles Young received a 'Distinguished Young Chemist Award' of the Federation of Asian Chemical Societies (FACS) in 1995. Upon retirement Bob Magee, Bob Cattrall, Ron Topsom, Jim Morrison, Bob Brownlee and John Hill were all awarded Emeritus Professorships, Terry Cardwell and Maureen Mackay were awarded Emeritus Scholar and Neville Arthur, Les Deady, Barrie Peel and Jim Reiss were awarded Honorary Fellowships and Charles Young was awarded an Honorary Associate Professorship in LIMS. In 2011, John Hill was conferred with B(Univ.) Honoris Causa, University of Surrey (UK). He was one of some 200

surviving students of Battersea College of Technology, London, which became the founding institution of the University of Surrey, Guildford, established in 1967, and all these students were awarded this honorary degree to mark the 120th anniversary of the foundation of Battersea College of Technology in 1891. It was an unexpected and unique honour.

Other awards and senior positions included: Jim Morrison – Officer of the Order of Australia (AO) (1990), Bob Cattrall – Member of the Order of Australia (AM) (2015), Arch Gallagher – La Trobe University Medal (1987), Ron Topsom – PVC (Research) (1980 to 88), (Bob Magee – inaugural Head of Menzies College (1966 to 1999), Dean of the School of Physical Sciences (1973 to 1976), Jim Morrison – Head of Chisholm College (1980 to 1989), Bob Cattrall – elected Member of the University Council (1974 to 1980) and Honorary Professorial Fellow in the Spas Kolev Analytical & Environmental Research Group/School of Chemistry/University of Melbourne (2006), John Hill – elected member of the University Council (1984 to 1986) – PVC/Head of AW Campus (2000 to 2005), – Visiting Professor, Centre for Thermal Studies, University of Huddersfield, UK (2000 to 2005), – Grad. Dip. (Environmental Management), La Trobe, 1998, PhD (Chemical Education) Melbourne (2006), B (Univ.) Honoris Causa (Surrey) (2011), Terry Cardwell – HSC Chairman of Examiners (1985 to 1986), Bob Cattrall (1995), Terry Cardwell (1998) - RACI Analytical Chemistry Division Medal, Bob Cattrall – RSC London Australasian Lectureship (1996). Bob Brownlee was awarded the RACI Bimolecular Division, Adrian Albert Award in 1998 for his contributions to Medicinal Chemistry. Charles Young was appointed Associate Professor in LIMS in 2013.

Since foundation, the University has continuously emphasised that 'quality teaching' enhances the 'learning experience' of students and over the decades many university-wide teaching and learning strategies have been implemented. However, rewards for teaching excellence were not introduced until the early 1990's when the criteria for promotion to Level D were amended to allow applications to be preferentially based on an outstanding teaching record as assessed by several parameters including student assessment of courses. Also, only in recent years have awards for teaching excellence been introduced and these are highly contested. Current chemistry academic staff have received these awards as well as State and Commonwealth Government Awards for the development and initiation of new teaching and learning strategies.

THE RESEARCH PROSPECTIVE

From its foundation, La Trobe Chemistry has progressively developed into a centre of research excellence across many well-established, contemporary and leading-edge themes, which has resulted in a cumulative higher degree graduations and a research publication record of distinction.

Research in all three traditional areas of chemistry developed rapidly from the 1970's onwards. With respect to organic chemistry and uncommon in Australian university chemistry departments at the time, there was no inherent natural product research at La Trobe. Rather, by the choice of Ron Topsom as foundation professor, initial priority was given to physical organic chemistry studies, with emphasis on the mechanisms of organic reactions and the transmission of substituent effects by spectroscopic (initially infrared) and kinetic means. On the more traditional side, projects concentrated on the synthesis and characterisation of heterocyclic compounds. As new staff commenced, the synthetic field expanded to other classes of

compounds and the development of new synthetic methodologies. Bioactive compounds became of special interest a collaborations developed with biologists at La Trobe and elsewhere. Rapid advances in NMR instrumentation saw this soon become the main spectroscopic tool for organic chemists, as well as generating research into advanced techniques for use of the technology. The mechanistic field expanded into the study of fast reactions and micellar catalysis as models for understanding the function of enzymes. It was a basic policy that organic research students should run their own diagnostic spectra rather than hand samples to a service provider. This policy is still current and adds significantly to the learning experience.

An early decision to concentrate organic research programmes in the broad areas of mechanistic, structural and physical organic chemistry differentiated La Trobe Chemistry from other academic chemistry departments in Australia. Organic research was supported continuously by numerous ARC, Anti-Cancer, NHMRC and industry grants. Major research projects were NMR interactions and drug development (Bela Ternai), NMR studies of substituent effects and theoretical calculations and, in collaboration with Jim Reiss and Don Phillips (Biochemistry), development of new anti-cancer drugs using molecular graphics (Bob Brownlee). Bob Brownlee also collaborated with Max O'Connor and Tony Wedd to develop Mo-95 NMR. Jim Reiss focused on the synthesis of 'bent' and 'battered' aromatic systems. He also developed and extensive stock of 'building block compounds'. He and Les Deady were part of the Cooperative Research Centre for Diagnostic Technologies. Jeff Rowe focused on synthetic organic chemistry and reaction mechanisms and Ron Topsom combined synthetic chemistry with theoretical calculations. Les Deady continued with synthetic heterocyclic chemistry and began a fruitful collaboration with Professor W. A. Denny at the Auckland Cancer Research Centre with generous financial support from Biota Holdings. Mike Davis continued with the development of synthetic methodologies for organic compounds. Trevor Broxton focused on chemical kinetics and the effect of micelles on catalytic processes.

La Trobe Chemistry research was profoundly enhanced by the progressive development of an NMR 'centre of excellence', established and directed by Bob Brownlee. In the 1960's, NMR spectrometers were mostly H-1 systems and were used for the routine identification of organic compounds (Varian A-60 and PE R10) and in teaching laboratories. The La Trobe NMR Centre continued to have a dedicated PE90 MHz spectrometer for routine diagnostics well into the 1990's. La Trobe Chemistry purchased one of the first Fourier Transform NMR spectrometers (JEOL 100 MHz) in late 1973, capable of multi-nuclear observations that expanded the use of NMR for the characterisation of inorganic compounds – notably coordination compounds. In particular, Mo-95 and F-19 studies were undertaken at this time. In the early 1980's, a 200 MHz superconducting system was purchased which greatly extended the multi-nuclear facet of the technique. The centre was one of the first in Australia to use polarization transfer methods for the structural determination of marine specimens.

These spectrometers were later replaced with Bruker 400 and 300 MHz systems and recently with Bruker 500 and 400 MHz systems. This very high cost equipment was purchased with pooled funding from La Trobe Chemistry, La Trobe University and ARC Linkage funding in combination with donor funding from Monash and Melbourne Universities. The La Trobe NMR centre was widely used by for internal and external investigations, which included studies of protein structures, drug/protein interactions, inorganic compounds and environmental systems in conjunction with the development of new NMR methodologies. The La Trobe NMR centre

was recognised for its expertise in multi-nuclear NMR, including probe construction and in the use of low-abundance and wide-line nuclei for structural studies. Also, the centre has been an important contributor to the annual Australian NMR conferences. Bob Brownlee was the founding member of the Melbourne NMR group, which commenced national NMR meetings in 1973 and he was a founder and director of 'ANZMAG', which has organised annual meetings since 1995.

With respect to physical chemistry, when Jim Morrison was appointed as foundation Professor of Physical Chemistry at La Trobe, he had initiated and conducted nearly 20 years of research in mass spectrometry at CSIRO (Fishermans Bend, Port Melbourne). Hence, not surprisingly, at La Trobe he supported obtaining the necessary equipment and staff to continue this research, which involved the establishment of mechanical, electronic and glass workshops. He also enticed John Smith from CSIRO to join La Trobe Chemistry as a Research Associate. Jim's first PhD student was John Traeger, who later joined the academic staff and worked with the first instrument constructed 'in-house' - a 'Photoionization Mass Spectrometer'. John Smith was involved in the development of the more ambitious construction a GCMS (Gas Chromatography/Mass Spectrometer). The third instrument to which Jim made pioneering contributions to was a 'Double QMS' (Quadrupole Mass Spectrometer). It was most appropriate to note that commercially built GCMS and QMS instruments are now fundamental equipment in all academic research chemistry and biochemistry departments as well as in other research and analytical institutions. In the late 1970's, John Smith in conjunction with his technical assistant Graham Bratspies, developed a new thermal analysis technique which became known as 'Programmed Probe Analysis' (PPA). This technique allowed rapid determination of the thermal decomposition of solid materials and involved programmed heating of a sample set into the probe of a mass spectrometer and hence 'in-situ' analysis of the decomposition products. In collaboration with John Hill, Smith and Bratspies applied this technique to thermally analyse a range of Sn(II) and Sn(IV) dithiocarbamate (coordination) complexes.

With the appointment of additional academic staff, Jim encouraged the development of chemical instrumentation in other fields. Consequently, with the arrival in 1969 of Barrie Peel and Graeme Nyberg, research commenced using the new technique of Photoelectron Spectroscopy, with the 'in-house' construction of a UV-Photoelectron Spectrometer and an Angle-Resolved Photoelectron Spectrometer. Later, Nyberg developed an Ultra-High Vacuum Surface Science instrument for the study of surface adsorbed molecules and Peel extended the Duel Chamber UV Photoelectron Spectrometer (completed in 1976) by the addition of a pulsed free jet inlet system which allowed the study of reactive and transient molecules, including molecular dimers and clusters. The Electron Physics group in the Physics Department also initiated research in Photoelectron Spectroscopy with an emphasis on solid state systems. Consequently Nyberg and Peel undertook some joint projects with the physicists John Jenkin, John Liesegang, Robert Leckey and John Riley. This collaboration led in 1977 to the establishment of the Research Centre for Electron Spectroscopy which gained considerable interest and support from colleagues overseas. In August 1978, the Centre hosted the inaugural Australian conference on Electron Spectroscopy which attracted numerous international participants.

Other foundation physical chemistry staff each established pioneering research programmes. Neville Arthur developed instrumentation for research in gas phase kinetics and Maureen Mackay, https://50years.latrobe/dr.maureen-florence-mackay, developed X-Ray

crystallographic equipment for the study of small molecule crystal structures. John Christie established a theoretical chemistry programme with emphasis on reaction rate theory. Peter Derrick designed and supervised the 'in-house' construction of a 'Field Desorption Mass Spectrometer' which involved the high voltages and large magnetic fields required for the study of high molar mass biological molecules. (This 'mega-machine' was dis-assembled and moved to the UNSW when Peter Derrick accepted a Chair in Physical Chemistry there in 1984). All these 'in-house' constructed instruments took advantage of 'on-line computer control' using a 'PDP – 8' system and subsequently (mid 1980's onwards) dedicated computers starting with the Apple II. The continued support of the ARC was crucial to the development and sustainability of La Trobe physical chemistry research throughout its history.

The appointment of foundation staff in the late 1960's and early 1970's with specialist research interests in both inorganic and analytical chemistry allowed a broad range of research strengths to be developed, which was expanded by additional staff appointments in the 1980's. Bob Magee had interests in both of these areas, the former involved synthesis and characterisation of metal complexes of sulphur-based ligands, specifically dithiocarbamate and xanthate complexes and the latter involved application of electroanalytical techniques. Bob Cattrall's research focused on solvent extraction of metal ions using high molar mass amine salts. He pioneered the development of the coated wire ion selective electrode and its application to the simultaneous determination of multiple anions and cations. Surface studies of ion selective electrode membranes were also undertaken. Later research focused on flow methods of analysis, including Flow Injection Analysis (FIA), discontinuous flow analysis, time-division multiplexing flow analysis and pulsed flow analysis. He developed polymer membranes for use in optodes and metal ion extraction. Significant contributions to the Cattrall/Cardwell research group were made by ARC Research Associates Greg O'Connell and Spas Kolev. The latter later became a Professor in the School of Chemistry at the University of Melbourne. Max O'Connor's research interests were in coordination chemistry, with particular emphasis on the synthetic and structural studies of molybdenum and tungsten complexes, along with their NMR, spectral and magnetic moment characterisation. He pioneered the development of multi-nuclear NMR, specifically, Mo-95, Si-29, Hg-199, S-33 and O-17, for the characterisation of thio-molybdates, thio-tungstates and di-mercurated arenes. He also focused on the synthesis and characterisation of optically active tris(dithiocarbamato) complexes of Rh, Ru and Co. Mike Grant's research involved kinetic studies of exchange reactions associated with coordination chemistry, specifically the kinetics and mechanisms of metal exchange reactions between divalent metal ions and their dithiocarbamate complexes. He applied N-14 NMR to study the rates of pyridine exchange in a series of pyridine adducts and he also used ESR to study the kinetics of reactions such as the dissociation of thiuram disulphides in solution. Tony Master's research investigated the structure of Mo complexes, including polyoxomolybdates and a novel oxo-Mo(V) thiolate complex of relevance to Mo enzymes, by emerging multi-nuclear NMR, EPR and electrochemical techniques. He collaborated extensively with Max O'Connor and Tony Wedd and was involved with the development of Mo-95 NMR in conjunction with Bob Brownlee. Tony Wedd's research interests were based on the synthesis and reactivity of binuclear reaction centres and the chemistry of molybdenum and tungsten in biological systems. Terry Cardwell's research included GLC and liquid HPLC chromatographic separation of volatile metal chelates, including the use of capillary columns in GLC and different detection modes. He developed on-line procedures for the analysis of ions and gaseous species by FIA and other flow-based instrumental techniques together with the application of gas diffusion and pervaporation

modules in FIA. John Hill's main research area of interest was thermochemistry. He applied calorimetric (solution and titration) and thermal analysis (TGA, DTA, DSC) to a wide range of systems of chemical, biological and environmental significance. Bruce James's research focused on the synthesis and characterisation of coordination compounds of the p-block elements, particularly those of Sn and Pb and in later years he collaborated with Honorary Research Associate George Domazetis in the development of clean coal technology. Shabbir Tariq had major interest in molten salt chemistry and the characterisation of these systems by spectroscopic and thermal analysis methods. Charles Young's research interests included studying the roles of metal ions in biological systems, in the environment and in industrial and chemical systems. Specifically, he studied modelling aspects of molybdo- and tungsto-enzyme function and the development of a complete synthetic model for the unique metal-sulphur sites in Mo/W-enzymes. He applied NMR, EPR, MCD, XAF/EXAFS and RR spectroscopies to the study of transition metal ions in biological and artificial systems.

The 1990's witnessed two new academic staff appointments. Professor Alan Bond brought his well-established research interests in the theory, instrumentation and application of electrochemical methods in the broad areas of inorganic and analytical chemistry to La Trobe Chemistry, thus embracing the knowledge and use of a broad spectrum of research disciplines such as kinetics (both homogeneous and heterogeneous), solution equilibria, thermodynamics, redox chemistry and synthetic chemistry in addition to a detailed understanding of modern, computer-based instrumentation and electrochemical theory. He had many collaborations with researchers in Australian and overseas universities and in the chemical industry. He also established the Centre for Scientific Instrumentation (CSI) with Bob Cattrall as Director. This research centre developed a number of collaborations with companies such as Pasminco Metals-EZ, Ionode, Kodak, BHP, Research Precision Devices, CRA-ADT and GBC. The latter provided ICP, AAI instrumentation to the Centre and the Department. Andrew Hughes's research interests were in the general field of organic synthesis, in particular, asymmetric synthesis and amino acid chemistry.

The turn of the century marked the commencement of regeneration of La Trobe Chemistry with the appointment of a group of new academic staff which led to many new and diverse research endeavours being pursued. These reflected 'frontier chemistry' and emphasised the synergy of chemistry and the physical, biological and life sciences. Belinda Abbott's interests are in medicinal chemistry involving the design, synthesis and evaluation of small heterocyclic molecules for applications ranging from malaria, motor-neurone disease, multi-drug bacterial resistance and cardiomyopathy. Carmel Abraham's interests are in supramolecular chemistry and specifically in crystalline coordination polymers. Peter Barnard's interests are in the synthesis and development of organic ligands and coordination complexes for medicinal and biological imaging applications. Jason Dutton's interests relate to the design of new molecules involving p- and d-block elements and computer design of molecules coupled with prediction of their properties. Mark Hind's interests focus on application of advanced NMR to investigate the structure and interactions of biomolecules. Conor Hogan's interests focus on molecular sensing involving the development of new chemical processes and new techniques, which result in 'ultra-low' detection limits, enhanced selectivity and miniaturised instruments which can be used 'within' and 'without' the conventional laboratory. Adam Mechler's interests relate to using small molecule self-assembly to create nano-structures: phospholipid membranes and peptide fibres such as artificial silk. Ian Potter's interests relate to the development of polymer membrane technology to prepare 'Polymer Inclusion Membranes'

(PIMs) and polymer-based microspheres as small scale chemical reactors and sensors for biological, environmental and industrial applications. Anne Richards' research field was inorganic and organometallic synthesis, crystal engineering and crystal structure determination. Evan Robertson's research focuses on understanding the conformational shape and function of biomolecules and the determination of the structure of atmospheric and inter-stellar 'nano' particles using the Australian Synchrotron's IR beam line. Brian Smith's research interests relate to the application of quantum mechanical methods to understand enzyme mechanism, molecular mechanical methods to explore the dynamics of proteins and X-ray crystallography to determine the structures of complexes of proteins, polypeptides and small molecules. Michelle Spencer's research interests focus on materials and nanostructures for applications in electronic devices, gas sensors and batteries. In particular, using density functional theory and ab-initio molecular dynamics simulations to determine the structure, dynamic properties and surface reactions of these materials. David Wilson's research is focused in computational chemistry, predicting 'new chemistry', modelling reaction mechanisms, studying metal-containing systems that phosphoresce and luminesce and modelling gas phase molecular properties of biologically important molecules, such as amino acids.

La Trobe Chemistry has a proud record of higher degree graduates spanning 50 years of research involvement, and a complete list of these is included in the Addenda. Over the 1970's decade, 46 higher degrees were awarded. Notable PhD graduates included: Geoff Scollary (First Chemistry PhD, 1972), became Foundation Professor of Oenology, Charles Sturt University, Wagga Wagga: Bob Shanks, 1972, became Associate Professor, Applied Sciences, RMIT University: Steve Slater, 1972, became Director, Stephen Slater Environmental Consulting, Sydney: Geoff Dromey, 1973 became Professor of Computer Science, Griffith University: Naseem Peerzada, 1973, (d. 2011), became Associate Professor, School of Environmental & Life Sciences, Charles Darwin University: Geoff Hughes, 1974, became Associate Professor, Applied Sciences, RMIT University: David Davey, 1975, became Associate Professor of Chemistry, University of SA: Laurie Gahan, 1975, became Professor of Chemistry, University of Queensland: Gary Willett, 1978, became Associate Professor of Chemistry, University of NSW: Kingsley Cavell, 1978, became Professor of Chemistry, University of Wales-Cardiff, UK: Ian Boyd, 1978, joined 'IP Australia' (Patents Office) and then became director of a company specializing in pharmaco-vigilance: Barry Meehan, 1979, became Associate Professor, Applied Sciences, RMIT University: George Domazetis, 1979, became Director of Clean Coal Technology (Melbourne) P/L and Honorary Associate, LTU Chemistry up to end of 2009.

Over the 1980's decade, 73 higher degrees were awarded. Notable PhD graduates included: Frank Carnovale, 1980, returned to LTU in 1984 as a post-doctoral fellow and later became Senior Scientist, EPA (Tasmania): David Craik, 1980, became Laureate Professor, Institute of Molecular Biosciences, University of Queensland and was elected the Australian Academy of Science in 2013, Phillip Marriott, 1980, became Professor of Chemistry, and Deputy Director of the Centre for Green Chemistry, Monash University: Michelle Livett, 1983, became Associate Professor of Physics, University of Melbourne: Graeme Hanson, 1984 (d. 2015), became Professor of Chemistry and a world authority on Electron Magnetic Resonance at the University of Queensland: Mary Millikan, 1984, became Associate Professor of Chemistry, Victoria University: Rohani Paimin, 1984, became Associate Professor of Chemistry, Victoria University: Chris Chandler, 1985, became CEO of 'AusPep', Tullamarine: Weng-Yang Wu, 1986, was a key chemist in the development of Biota's anti-flu drug 'Relenza' and later

became Director of R&D at 'Ausbiotec', Melbourne: Clyde Rodrigues, 1988, became Business Development Officer, Epsom Australia: Graham Wilson, 1988, became specialist advisor to Kodak, BP Bitumen and Puma Energy and Peter Hauser, 1989, became Professor of Analytical Chemistry, University of Basel, Switzerland.

Over the 1990's decade, 48 higher degrees were awarded. Notable PhD graduates included: Florian Del Mundo, 1990, became Associate Professor of Chemistry, University of the Philippines: Jacqui Gulbis, 1990, became research group leader at the Walter & Eliza Hall Institute of Medical Research, Melbourne: Roland DeMarco, 1991, became Deputy Vice Chancellor, University of the Sunshine Coast and formally Head of Applied Chemistry, Curtin University of Technology, WA: Ian McKelvie, 1992, became Associate Professor of Chemistry, Monash University and subsequently Honorary Principal Fellow, Chemistry, University of Melbourne: Peter Iles, 1992, became Professor, Salt Lake Community College, Utah, USA: Serge Scrofani, 1993, became Vice President Corporate Development, CSL, Michael Godfrey, 1994, became a Research fellow in Chemistry at La Trobe University: Nurul Quazi, 1994, became Production and Product Development Manager at Boron Molecular: Ian Potter,1995, became Senior Lecturer, La Trobe Chemistry: Peter Traill, 1995, became Laboratory Manager, Department of Pharmacy, University of Tasmania: Ellak von Nagy-Felsobuki, 1995, became Professor of Chemistry, University of Newcastle and was awarded the first DSc from La Trobe University: Grace Gregorio, 1996, became Associate Professor of Chemistry, University of the Philippines: Graeme Cross, 1996, became Founder of 'Cerium Designs' (Melbourne): Melinda Christophersen, 1997, became Manager of Analytical Services, Carlton United Breweries, Melbourne: Anthony Kaye (1997) became General Manager at Boron Molecular: Lilibeth Coo, 1999, became Associate Professor of Chemistry, University of the Philippines: George Argiropoulos, 1999, became Quality Assurance Manager, 'Sypharma' (Melbourne).

From 2000 to 2017, 53 Higher Degrees were awarded. Notable PhD graduates included: Thomas Rodemann, 2001, became Deputy Director, Central Science Laboratories, University of Tasmania: Michelle Spencer (2001) is now Associate Professor, Head of Chemistry and Acting Associate Dean of Chemistry and Environmental Science at RMIT University: Anastasios (Tash) Polyzos, 2004, is now a Senior Lecturer, School of Chemistry, University of Melbourne: Sakchai Satienperakul, 2004, became Head of Chemistry and subsequently Dean, Faculty of Science, Maejo University, Chiang Mai, Thailand: Michelle O'Rourke, 2010 joined URS Environmental Consultants, Perth: Gregory Barbanti, 2011, became a Research Fellow in Chemistry at University of South Australia: David Piper, 2011, became a Senior Scientist at Orica: Egan Doevan, 2012, became a Research Fellow in Chemistry at Deakin University: Van Quan Vo, 2013, became a Lecturer in Chemistry at Hue University, Vietnam: Monthida Raoarun, 2014, became Lecturer in Chemistry at Kasetart University, Thailand: Devin Benheim, 2015, became Operations & Project Manager at Viropharm P/L, Melbourne: Swapna Johnson, 2016, became a Research Fellow in Medicinal Chemistry at Monash University and Sarah Laird, 2016, became a Research Fellow in Chemistry at the University of Strasbourg.

Over the past decade, La Trobe Chemistry has attracted significant external research funding, with current academic staff being Chief Investigators on 5 ARC Discovery Projects, 5 NHMRC Project grants, 3 ARC Future Fellowships and 3 ARC DECRA fellowships. In addition, substantial funding has been received from medical research organisations such as the Australian Nuclear Science and Technology Organisation (ANSTO) and the Cure for Motor Neurone Disease Foundation.

The research excellence of La Trobe Chemistry over the past 5 decades is not only evident from the impressive number of Higher Degrees awarded but also by the total research funding quantum received, estimated to be in excess of $26m. This figure is inclusive of infrastructure funding received from the University and competitive external research funding awarded to academic staff. Further endorsement of research excellence is evident from the realistic estimation of the minimum total number of publications emerging from La Trobe Chemistry over a fifty year period, based on peer-reviewed journals in which staff members are author or co-author and including books, book chapters and review articles published and patents granted during their tenure in La Trobe Chemistry. These contributions total 3300. These three quantitative indicators reflect and justify the status and standing of La Trobe Chemistry as a leading research institution in Australasia, which continues to have a significant input to and influence on global chemistry scholarship.

Other research-based achievements of La Trobe Chemistry should be noted. For example, Bruce James had a long and arduous role on the University Higher Degrees Committee, beginning in 1986 as the 'Sciences Representative', then 'Faculty Representative, then Deputy Chair to 2005 and Chair from 2007. During his tenure, he conducted many workshops on the responsibilities of supervisors of higher degree students and the modus operandi of the Higher Degrees Committee particularly with respect to its handling of examiners reports.

In memory of Max O'Connor who died in 1985, a Memorial Lecture was established in 1991 in his honour through a donation from his family and it remains as a signature annual event. Glen Deacon (Monash) gave the inaugural Max O'Connor Lecture and a list of subsequent speakers is given in the Addenda. Similarly, the 'James D. Morrison Symposium' was held in 1990 to honour Jim Morrison's achievements, innovations and advancements in mass spectrometry.

Over its fifty years of existence, La Trobe Chemistry faculty initiated many national and international collaborations. For example, Bob Cattrall established collaboration with Professor Henry Freiser, University of Arizona on ion selective electrodes and Bela Ternai developed collaborations with the Department of Chemistry, Chulalongkorn University, Bangkok, Thailand. John Hill established collaborations with Professor Edward Charsley, Centre for Thermal Studies in the University of Huddersfield, UK on applications of thermal analysis techniques, particularly the new 'sample controlled thermal analysis techniques. He was also associated with the 'Yunnan/LTU Joint Research Collaboration Agreement' and attended the 3rd Joint Conference in Kunming in 1998 on the theme 'Natural Resource Management – Biological Connections' at which he presented a paper 'Environmental Trace Metal Analysis'. He was appointed a 'Senior External Examiner' for PhD (chemistry) theses presented to Andhra University, Visakhapatnam, India since 1980. From 2004 to 2006 he collaborated with Prof. Dr. Saleem Mustafa, Director, Borneo Marine Research Institute, University Malaysia Sabah (UMS) on the chemistry of the marine environment and on the importance of water quality in aquaculture. This led to several publications on Sustainable Natural Resource Management and to a book 'Green World Order', Lambert, ISBN 978-3-8443-2193-7. In 2008, he also collaborated with David Barlow, Chemistry, Otago University, NZ on devising 'An alternative curriculum framework for the Chemistry 1 course' and from 2010 onwards with David Kumar, College of Education, Florida Atlantic University, USA on education in 'Fuels, Energy and Environmental Sustainability'. The move of La Trobe Chemistry to the new LIMS building in

2013 facilitated further collaborations with biochemistry and genetics groups, thereby strengthening molecular architecture research and understanding biomolecular interactions among many others.

Many international visitors on 'sabbatical leave' were attracted to La Trobe Chemistry over the period of review, including M. N. Sastri, Andhra University, Visakhapatnam, India (Inorganic): Jim Bobbitt, University of Connecticut, USA (Organic): Arthur Finch, Royal Holloway College, University of London (Thermochemistry): C. N. R. Rao, Indian Institute of Science, Bangalore, India (Physical): Jim Coxon, University of Canterbury, NZ (Organic): Rob Smith, Otago University, NZ (Organic): Ross Grimmett, Otago University, NZ (Organic): Bob Taft, University of California, Irvine, USA (Organic): Bart Webster, Delft University, Netherlands (Organic): Sven Hammer Und, The Technical University, Copenhagen (Organic/Physical): John Zoltewicz, University of Florida, USA (Organic): Alan Katritzky, University of Florida, USA (Organic): Helmut Hoenig, Technical University, Gratz, Austria (Organic): Bob Metzger, San Diego State University, USA (Organic/Physical): John Tedder, University of Dundee, Scotland (Organic): John Fenn, (Nobel Prize, Chemistry, 2012), Virginia Commonwealth University, USA (Physical): Fred McLafferty, Cornell University, USA (Physical/Organic): Sid Miller, Illinois Institute of Technology, USA (Organic): Leroy l, University of Oregon Eugene, USA (Organic): Andrew Holmes, Cambridge University, UK (Organic): John Enrmark, University of Arizona (Inorganic): Yoshinari Baba, Myazaki University, Japan (Analytical): Yukio Sakai, Myazaki University, Japan (Analytical), Ron Thomas, University of Wales-Cardiff, UK (Analytical), Milka Neshkova, Bulgarian Academy of Sciences, Bulgaria (Analytical), Harry Bloom, University of Tasmania (Analytical) and David Kerridge, University of Southampton, UK (Analytical). All these distinguished visitors added significantly to the research culture of the Department, especially in terms of presenting seminars and providing encouragement to and mentorship of postgraduate students.

In 2010, Belinda Abbott and Adam Mechler organised a one day 'Themed Retreat' on 'Molecular Design and Synthesis' and 'Molecular Processing and Analysis'. The objective of the retreat was to embrace and to integrate many of the research pursuits within LIMS and to convert these themes into 'functional entities'. The main topics addressed included computer simulations, molecular sensing, environmental chemistry and instrumentation. Also, Seb Marcuccio addressed the advantages and pitfalls of commercialisation through practical examples encountered in setting up and managing spin-off companies.

The 2017 Royal Australian Chemical Institute (RACI) Centenary Congress in Melbourne (23 – 28 July) brought together some 3300 Australian and international delegates from across the range of the chemical sciences and technologies. The Congress encompassed the RACI Centenary Conference together with several partner conferences, including the 17th Asian Chemical Congress (17ACC), Carbon 2017 (The World Carbon Conference), Chemeca (Australian and NZ Federation of Chemical Engineers Conference), AIMECS17 (The Asian Federation of Medicinal Chemists' Conference), ACCC6 (Asian Conference on Coordination Chemistry), GSC8 (8th International Conference on Green and Sustainable Chemistry), 'Elsevier's Tetrahedron – an Asian seminar' and the 'Asian Hub for e-D Discovery' (AHeDD) conference. La Trobe Chemistry academics (Belinda Abbott, Carmel Abrahams, Peter Bernard, A. Barrow, Jason Dutton, Chris Ennis, Conor Hogan, Y. Hong, Evan Robertson, D. Winkler and David Wilson) gave a total of 14 oral presentations over the duration of the congress. Four current PhD students (R. Auchetti, A. Haghighatbin, R. Karmis and B. Stringer) also gave oral

presentations alongside more than 25 poster presentations by La Trobe Chemistry postgraduate students. Jason Dutton was also co-presenter of two chemistry magic shows for secondary school students.

THE TEACHING AND LEARNING PERSPECTIVE

From its foundation, La Trobe Chemistry has instituted and maintained an emphasis on quality teaching and throughout the subsequent five decades, it has modified, diversified, strengthened and up-dated its teaching and learning strategies. Also, in the early years, it was apparent that most of the enrolled undergraduate students came largely from the northern suburbs of Melbourne and commonly were the first members of a family to attend university. La Trobe Chemistry planned its course structures to be comparable in standard and status to those of Melbourne and Monash Universities with some additional consideration given to the special needs of the participating students.

The University admitted its first cohort of students (496) on March 8, 1967. A hundred of these were undertaking science degree programmes and hence 'Chemistry 1' (56 from the School of Physical Sciences and 44 from the School of Biological Sciences), which constituted a large class in a fledging University. Initially 'Chemistry 1' teaching was undertaken in the Library but was subsequently moved to the newly constructed East Lecture Theatre (ELT) complex in the early 1970's. Les Deady presented the 'inaugural' organic Chemistry 1 lectures and Bob Cattrall and Bob Magee delivered the inaugural inorganic lectures. Jim Morrison delivered the inaugural physical chemistry lectures. Mike Davis coordinated the 'Chemistry 1' laboratory sessions. It should be noted that at this time, technology support for teaching was very limited so teaching was only possible via 'talk the chalk' with the support of slide projectors.

'Chemistry 1' was subsequently divided into 'Chemistry 1A' and 'Chemistry 1B'. The latter was a compulsory unit for students enrolled in the biological and agriculture sciences. Additionally chemistry made a contribution to a degree in Chemical Physics instituted in conjunction with the two divisions of Physics. Of particular significance in undergraduate teaching was the compulsory laboratory sessions for Years 1 – 3 in each of the 3 main areas of chemistry and from the earliest sessions, laboratory coats and safety glasses were compulsory requirements. OH&S legislation at this time was in its infancy and limited in scope.

For the 1967 cohort, 73 passed 'Chemistry 1' and 27 failed. In 1968, 149 students completed 'Chemistry 1' with an overall pass rate of 76%. Also, 33 students were enrolled in 'Chemistry 2A' and 9 in 'Chemistry 2B' which led to an overall pass rate of 87%. In the same year, ten Honours and seven MSc (Preliminary) students were enrolled. Some of these were John Traeger, Steve Slater, Ken Peverill, Bob Shanks, John Fisher, I. Cody and K. Chenoweth. Also, Bob Magee as 'Chairman of Examiners' introduced an External Examiner/Moderator system for oversight of 'standards' and 'assessments' of undergraduate and Honours chemistry courses. Professor Ron Brown (Monash) was appointed to this role and attended annual examiners meetings which were held in the Library. He was later succeeded in this role by Professor Bruce West (Monash). This moderation role was discontinued in the mid 1970's.

It should be noted that common facilities and student amenities on the campus at this time were limited and transit between buildings was difficult, especially in inclement weather since inter-connecting walkways had not yet been constructed so gum boots and umbrellas

were provided in vestibules! Also, car parks at this time were levelled dirt paddocks and no public transport serviced the campus. Essential commercial facilities such as banks, post office, pharmacy, hairdresser and coffee shop did not become available until the Agora was constructed in 1969, although a Bank of NSW facility was available in Glenn College from 1967. Early Graduation Ceremonies were held in the Glenn College dining hall until the Union Hall became available for this purpose in the mid 1970's.

In the early 1970's, La Trobe Chemistry already had a comprehensive teaching programme for all 3 years of the BSc degree and, in addition, had a well-established Honours programme. The 'Chemistry 1' programme was constructed in the traditional style and format with two streams, 'Chemistry 1A' and 'Chemistry 1B'. The former was for those students who had passed the Higher School Certificate (HSC) Chemistry and the latter was for those who had no previous experience in chemistry or who had failed HSC Chemistry. 'Chemistry 1B' was aligned with 'basic chemical knowledge' as required by the biological and agriculture sciences. In addition, all 'Chemistry 1' students had 3 hours each of inorganic, organic and physical chemistry laboratory sessions conducted weekly throughout Semester 1. A balanced mixture of synthesis, qualitative and quantitative analytical experiments were included. Overall assessment was based on traditional written examinations plus laboratory assessment on a weekly basis. It is noteworthy, that in the absence of 'collating machines', laboratory manuals at this time were collated by a small army of 'volunteers' (staff and postgraduate students). Also in the 1970's, an external studies program was initiated for Year 1 students on a trial basis and some of these participants continued to 'Chemistry 2'. The most notable of these was mature age student Iris Manton, who went on the graduate with a BSc (Hons.) Geology. She was the oldest student at that period to do so and she epitomized the ambitions and commitment of mature age students newly enrolled into the University in the 1970's decade.

In the 1980's, the foundation Organic staff (Davis, Deady and Topsom) authored two editions of 'Introductory Organic Chemistry' – universally known as 'DDT' - that was used as a companion Chemistry 1 text for many years and Bob Cattrall, John Hill, Maureen Mackay, and Barrie Peel published 'in-house' 'Chemistry for the Biological Sciences' (1987) based on their Chemistry 1B lectures and this was made available to Year 1 chemistry students at a very reasonable price through the University Bookshop. In 1987, a 'Chemistry Resource Centre', aimed at facilitating student inclusion and learning in a welcoming, less formal environment, was established by Charles Young and staffed on a roster basis. A 'Bridging Course' was also introduced to assist students with limited backgrounds in chemistry to prepare for Chemistry 1 courses. In 2011, John Hill was appointed Editor of the 'Solutions Manual' accompanying the Year 1 tertiary reference text 'Chemistry' (2nd Edition): Blackman, Bottle, Schmid, Mocerino and Wille, Wiley, Brisbane – published in 2012.

In the 1990's, the 'Chemistry 1' structure changed into 3 streams: 'Chemistry General', 'Chemistry Basic' and 'Chemistry Applied'. 'Chemistry Basic' was a one semester course for those enrolled in sciences other than chemistry. The 'Chemistry 1' course was made available 'on-line' from 1992 and during this period, La Trobe Chemistry assisted and moderated 'Chemistry 1' courses delivered at the Bendigo, Wodonga and Mildura campuses of the University.

'Chemistry 2' was also constructed in two streams which built on the basic concepts of chemistry introduced in 'Chemistry 1' and applied these to expand the chemistry knowledge base of students. For example, in organic chemistry, synthesis methodologies and organic

reaction kinetics and mechanisms were emphasized in conjunction with the principles of the emerging diagnostic NMR technique. In inorganic chemistry, coordination chemistry and p-block element chemistry were introduced together with the principles of the characterisation techniques of infrared, conductance and magnetometry. For physical chemistry, surface chemistry, crystallography and emerging instrumental diagnostic techniques such as mass spectrometry, molecular spectroscopy and gas phase chemistry were introduced. Weekly 3-hour practical sessions in each semester were compulsory which for inorganic and organic were structured around synthesis in conjunction with characterisation by techniques such as UV-Vis and infrared spectroscopy and especially NMR. Strong emphasis was placed on students having 'hands-on' experience with common laboratory instrumentation such as UV-Visible spectrophotometers.

'Chemistry 3' continued with the two stream format with the B stream having an applied/industrial chemistry emphasis, while the A stream tended to focus on 'emerging chemistry' concepts and introduce the principles and significance of research. 'Chemistry 3' also included weekly 3-hour laboratory sessions in each branch of chemistry, which involved multi-faceted advanced experiments in conjunction with access to 'hands-on' experience with advanced instrumentation such as NMR, IR, UV-VIS, HPLC, Thermal Analysis, MS and ESR. The 'Chemistry 3' laboratory programme essentially consisted of a series of 'mini-projects which were undertaken by student pairs. The 'Chemistry 3B' course also included visiting lecturers – largely from the chemical industry, who gave an insight into their specialist areas and also an overview of career opportunities available, so as to give students an insight into 'chemistry in the real world'.

A 'Chemistry 3A' course worthy of special mention is 'Molecular Design' which was a completely computerised based course. A 'Chemistry 3B' course of topical interest was 'Fuels and Energy', which focused on the range of fossil fuels currently used in the power and transportation industries. This course not only involved visiting lecturers but a visit to the La Trobe Valley Coal-Fired Power stations in the La Trobe Valley. This course was expanded from 2000 onwards to include 'sustainability' and address the paradox that the continued combustion of fossil fuels to produce energy is unsustainable if the natural environment is to survive the consequences of climate change.

From inception, the Honours course consisted of specialist lectures on topical and leading edge chemistry plus a minor thesis, the former being assessed by conventional examinations and the latter by the supervisor and by oral defence. Overall, assessment was based on a coursework/thesis 80/20 formula. From the 1990's onwards, Honours students each had to present a short seminar on their research project which was compulsory but was not assessed. This was designed to give them experience in making presentations at national and international conferences in their future careers.

The 2000's onwards marked a major change in the structure and culture of La Trobe Chemistry with most of the 'first generation' of academic staff having retired or moved and a 'next generation' being appointed. This led to a blending of the traditional main areas of chemistry and an emphasis on 'new chemistry' and in particular, three major themes: 'Molecular Modelling', 'Molecular Sensing' and 'Medicinal Chemistry'. This 'restructure' led to a range of new/topical chemistry courses being introduced from Year 2 onwards.

From 2004 to 2009, ‘Chemistry 1’ experienced a doubling of student numbers but a corresponding decline in student performance. This prompted a comprehensive review of all aspects of the curriculum, teaching methodologies and student engagement strategies. Amongst the changes subsequently instituted was to embed extensive on-line learning as part of the assessment procedures and this initiative was one of the first chemistry programmes in Australian Universities to do so and the transformation culminated in stunning improvements in student learning and achievement as reflected in enhanced pass rates and grades. This initiative was recognised by a University Teaching Award in 2010 and subsequently in 2013 by an Office of Learning and Teaching National Citation to the first year chemistry team, which included Carmel Abrahams, Adam Mechler, Ian Potter, Evan Robertson and David Wilson. The citation read ‘(For) guiding students to deeper learning through inspirational teaching and the design of an integrated learning program focussed on conceptual understanding of chemistry’.

In the 2000 era, the ‘Chemistry 2’ course has been structured on traditional lectures, practical laboratory sessions and tutorials. Lecture titles have varied from year to year but have included: ‘Analytical Chemistry’, ‘Biological Chemistry – Metals and Proteins’, ‘Carbonyl and Aromatic Chemistry’, ‘Medicinal Chemistry’, ‘Medicinal and Organic Chemistry’, ‘Nano-chemistry’, ‘Solid State and Materials Chemistry’, ‘Spectroscopy, Mass Spectrometry and Separation Science’ and ‘The Chemistry of Important Elements in the Periodic Table’. In any given year, students have to choose 6 lecture topics from the list available and assessment is based on conventional examinations (80%) and laboratory performance (20%).

Similarly, the ‘Chemistry 3’ course is based on traditional lectures, practical sessions and tutorials. Lecture titles include ‘Bioinorganic Chemistry’, ‘Electrochemistry and Chemical Sensors’, ‘Fuels, Energy & Environmental Sustainability’ (FEES), ‘Heterocyclic Chemistry’, ‘Instrumental Analysis’, ‘Materials Modelling’, ‘Medicinal Chemistry’, ‘Molecular Design’, ‘Optical Spectroscopy and Sensors’, ‘Separation Science’ and ‘Surface Chemistry’. In any given year, students have to choose 6 lecture topics from the list available and assessment is based on the same formula as for ‘Chemistry 2’. In 2013, the final semester Year 3 laboratory programme was reorganised and developed into a ‘multi-dimensional experience’. Teams of students now undertake a ‘Capstone Project’ alongside an academic staff mentor, within the themes of medicinal, organometallic or analytical chemistry. The academic team involved in this restructure – Belinda Abbott, Peter Barnard, Jason Dutton, Evan Robertson and Mandeep Kerr were awarded a La Trobe University Citation for ‘Outstanding Contributions to Student Learning’ in 2016 and have been nominated for a similar citation in 2017 within the ‘Australian Awards for University Teaching’ national programme.

The present Honours programme is based on conventional lecture courses and a minor thesis based on the research interests of the present complement of academic staff namely: ‘Medicinal Chemistry’, ‘Supramolecular Chemistry’, ‘Molecular Design’, ‘Molecular Sensing’ and ‘Computational Chemistry’.

Between 1990 and 2008 an innovative collaboration programme was established between La Trobe Chemistry and the Victorian Forensic Science Centre (VFSC) at Macleod involving mainly Jeff Rowe and Jim Pearson from VFSC. This collaboration involved a total of 20 jointly supervised honours students and the establishment of a Graduate Diploma (part time) in Forensic Science, spread over 2 years. The chemistry section of this diploma was delivered by Drs. Pearson, Rowe and Traeger with biological and legal inputs from other departments of

the University. Five cohorts of students completed this diploma over the ten year period of its existence.

Honours projects jointly supervised by VFSC mainly involved the synthesis and characterisation of the methylamphetamine and ecstasy (MDMA) classes of illicit drugs. One such project involved the synthesis of 12 structural isomers of methylamphetamine, which were thought to have similar analytical profiles and showed that the analytical methods used by the VFSC could identify and differentiate between all of these isomers. Other projects involved developing methods for converting pseudoephedrine into methylamphetamine and for the synthesis of MDMA and other related drugs. Also, several projects investigated the analysis of explosive and propellant residues by ion chromatography and capillary electrophoresis. Bonuses of this collaboration were that these joint honours projects were very popular and that many participating students were subsequently employed by the VFSC.

A range of Awards and Prizes has been available for outstanding performance by undergraduate chemistry students in three categories: University-wide, Faculty (now College)-based and Department-based. The David Myers Medal is awarded annually to the highest performance by an undergraduate student (usually an Honours student) in each Faculty (now College). Michelle Spencer won this award in 1996. Faculty-based awards include the Dean's Medal and inclusion in the Dean's Honours List. Chemistry Department (sponsored) prizes include 'The Jim Morrison Prize' (Year 1), 'The Michael Grant Prize' (Year 2) and 'The Max O'Connor Prize' (Year 3).

Over the last two decades, teaching and learning skills have received paramount significance within the University ethos and senior academic staff have been appointed as directors of Teaching and Learning, previously in each of the 5 Faculties and presently in each of the two Colleges. Numerous University-wide teaching and learning strategies have been implemented and recently (2015) 'The Teaching and Learning Commons' building was opened as a 'start-of-the-art' teaching and learning facility. It is ironic that over the previous 47 years this building was the home of La Trobe Chemistry.

'Quality Assurance' has also featured prominently in establishing benchmarks and for setting standards for teaching and learning throughout the University and student assessment of teaching has become a routine primary metric of quality in this domain. La Trobe Chemistry has enthusiastically embraced and implemented these initiatives and the Department as a whole has consistently been acclaimed and rewarded both in the promotion process and more recently by competitive University and State Government citations and awards for its commitment and progressive achievements in the teaching and learning domain. La Trobe Chemistry has a proud and sustained record of performance excellence in its cumulative teaching and learning portfolio.

OUTREACH INITIATIVES

University Open Days were introduced in the 1980's and held on a Sunday in August, timed thus to coincide with the period when Year 12 students were considering their futures in terms of possibly postponing their chosen career in favour of further study in a tertiary institution. La Trobe Chemistry consistently presented its course offerings in an instructive manner at these Open Days by setting up interactive displays and consultations with academic

staff in conjunction with guided tours of the Department, which highlighted its facilities and particularly its 'state-of-the-art' instrumentation. The well-attended 'Chemistry Magic Shows' presented variously by Mike Grant, Tony Wedd and Charles Young and later by John Christie were a highlight of these Chemistry Open Days. Unfortunately these magic shows were discontinued in the late 1980's due to OH&S constraints and safety concerns for the audiences! In the 1990's, the chemistry interactive displays and staff consultations were integrated with the Faculty course presentation initiatives and located on the Level 2 walkway with 'demonstrations', 'live experiments' and 'interactive computer displays' located in PS3 laboratories. In recent years, the popular 'Chemistry Magic Show' has been reintroduced along with some additional 'live experiments' in a marquee adjacent to the LIMS building.

La Trobe Chemistry has consistently created and sustained interactions with the chemical industry and Government (scientific) institutions. In the early 1980's, the Environment Protection Authority/Victoria rented two laboratories and several offices in PS4/Level 3. The group was headed by Harry Blutstein and there was extensive collaboration with the Inorganic and Analytical Chemistry Department and opportunities were available for joint supervision of Honours projects in environmental chemistry. The EPA subsequently moved to a purpose-designed facility in the La Trobe University Research Park in the 1980's but collaboration with La Trobe Chemistry has continued to the present. Also in the 1980's, John Hill established interactions with the Brown Coal Council of Victoria (BCCV), which had its analytical laboratories based in the Gippsland CAE (now the Gippsland Campus of Federation University) directed by Sam Heng. This provided a unique opportunity for PhD student Shengping Ma to undertake thermal analysis studies of brown coal as part of her research project which led to joint publications with the BCCV. Similarly, collaborations have been established with the National Forensic Science Laboratory (also located in the LTU Research Park) and the Department of Environment and Primary Industry and the Defence Sciences (Port Melbourne). The on-going collaborations with the National Forensic Science Laboratory have led to joint supervision of Honours projects and introduction of forensic science courses in the Honours programme.

In the 1990's, La Trobe Chemistry enhanced its interactions with the chemical industry by encouraging small companies to locate staff in the Department and use the instrumentation therein. Such companies included Narhex (AIDS drug development), Boron Molecular, Iliad Chemicals and AKALL. Staff of these companies made significant contributions to the Department in terms of interaction with organic faculty and research students. Of these, the contributions made by Damian Grobelny and Seb Marcuccio are most noteworthy. In addition, these collaborations have provided students with an insight into the diverse range of career opportunities in the chemical, biochemical and medicinal sciences.

During the period 1990 – 93, Bruce James joined Charles Young (Coordinator and Head Instructor) and Peter Nichols (Monash University) in planning and delivering an 'AusAid' workshop in inorganic and analytical chemistry at the University of the Philippines, Banös. The aim of the project was to enhance the teaching and learning metholodogies of inorganic chemistry in the Philippines via a teachers' workshop involving lectures and 'hands-on' laboratory experiments. Also from 1999 to 2000, Bruce James was appointed an independent international assessor of applicants for the position of Associate Professor in Inorganic and Analytical Chemistry at Quaidi-Asam University, Islamabad, Pakistan. In the late 1990's, Bruce James was appointed Leader of the Materials Science sub-program of the 'Thai-Australia

Science and Engineering Project' (TASEAP) which was an 'AusAid' and World Bank funded project over the period 1999 to 2001. His responsibilities included: conducting a 'needs-based' analysis which provided short-term advisors and consultants to eight Thai public universities with respect to Materials Science programs, delivering work-books, providing course and research advice to academic staff, including Deans and Professors and also identifying faculty staff for further academic training in Materials Science in Australian universities.

Many of the La Trobe Chemistry faculty have been and continue to be members of the Royal Australian Institute (RACI) with most of the first generation holding 'Fellowship' status. Their contributions to RACI committees and events such as congresses and conferences have been noteworthy for the levels of commitment and dedication and their ability to promote 'chemistry' in the wider community and particularly in the high school sector.

La Trobe Chemistry has operated a very successful Year 10 High School Enrichment Programme from the 1980's to the present. It was subsequently expanded into a Year11/12 laboratory-based programme with many hundreds of students undertaking 'hands-on' experiments using equipment and facilities generally not available in high schools. Also, the programme gave high school students an insight into a university environment and its learning culture and showed how modern chemical instrumentation is used to identify and characterise chemical compounds. The programme was coordinated by several staff over the decades including Terry Cardwell, Graeme Butt and Helen O'Hara.

In 2004, Bob Brownlee and later David Wilson developed a programme to teach 3-D molecular structures on computers typically available in high schools. In particular, they presented these instruction sessions at Northcote High School on their designated ICT day each year and also at Science Teachers Association of Victoria (STAV) conferences held annually at LTU. The programme was considerably enhanced through the 'ASISTM' grant scheme and involved investigating and analysing by NMR a range of organic, inorganic and small protein structures and drug-receptor interactions. The interaction with Northcote High School was further enhanced by teaching Year 12 students how to operate the NMR spectrometer in the La Trobe NMR centre, who then became proficient in running and interpreting NMR spectra.

John Hill was a member of the Hong Kong Council for Accreditation of Academic and Vocational Qualifications (HKCAAVQ) for more than 20 years. In 1993, he was invited to Hong Kong to assess/accredit analytical chemistry courses delivered in Hong Kong Baptist College. Also, in 2003, he was appointed by the Council of the National University of Malaysia (University Kebangsaan Malaysia (UKM), to undertake a review of the Department of Chemistry – primarily focused on the quality of its undergraduate courses in comparison with similar courses in leading international universities.

In the mid-2000's, retired chemistry academic staff generously donated chemistry text books and chemistry journal runs from their personal libraries to the Science Library of Maejo University, Chiang Mai, Thailand. Bob Brownlee and John Hill were subsequently invited to a reception function in 2007 at which a section of the Maejo Science Library was named 'The La Trobe Collection'. Subsequently in 2009, the Maejo Chemistry group, which included Sakchai Satienperikol (PhD La Trobe, 2004), visited La Trobe Chemistry to initiate collaborative research projects and investigate the possibility of establishing undergraduate and postgraduate exchange programmes.

LA TROBE CHEMISTRY 50th ANNIVERSARY CELEBRATIONS

A one-day scientific symposium and a celebration dinner were held on 21 July 2017 to mark and celebrate 50 years of La Trobe Chemistry. The organising team for these memorable events comprised, Belinda Abbott, Carmel Abrahams, Peter Barnard and Jason Dutton. The Symposium was chaired by Peter Barnard and was officially opened by the Vice Chancellor, Professor John Dewer and his address was followed by the 2017 Max O'Connor memorial lecture delivered by Spas Kolev. Further contributions were delivered by previous academic staff and PhD graduates of La Trobe Chemistry and included: Phillip Marriott, Melinda Christophersen, Tony Wedd, David Craik, Jacqui Gulbis, Alan Bond, Anastasios Polyzos and Charles Young. The Symposium concluded with an informal celebratory drinks function in conjunction with a student poster session and tours of the LIMS building. Some 85 past and present staff and postgraduate students attended the dinner function in the Odeon Function Room of the Union Building. The guest speakers were Bob Brownlee, David Wilson and John Hill, who were introduced by the Head of the School of Molecular Sciences, Professor Brian Smith. Both the Symposium and the Dinner were most befitting and lasting mementoes of '50 years of La Trobe Chemistry'.

LA TROBE CHEMISTRY IN THE 'FUTURE-READY AGE'

Perhaps the most remarkable achievement of La Trobe Chemistry is that it has survived as a cohesive, independent academic unit for nearly half a century, when most academic chemistry departments in Australia outside the 'GO8' have either amalgamated with other science departments or closed down. La Trobe Chemistry has continuously demonstrated its sustainability since its foundation despite many university restructures and continuous financial and infrastructure constraints. Its achievements over the last fifty years, as measured by its quality staff, research publication output, number and financial value of competitive external and internal research grants awarded and the number of higher degree graduates produced, testify to the overall resilience of the department to external and internal forces of change and a determination to survive and develop via passionate commitment to academic excellence. Its history thus far foreshadows it is well placed in terms of moving towards a sustainable and rewarding future and that it is able to retain its leadership status among academic departments of the University in conjunction with continuing recognition of its academic excellence both nationally and internationally.

ACKNOWLEDGEMENTS

This 'chemistry history project' has evolved over a period of some twelve months to reach culmination. It has relied very significantly on the input of many of our colleagues, especially Bob Cattrall, Les Deady and Barrie Peel, who provided valuable input with respect to appointments, course structures, research developments and significant events of the 1960's and 1970's, Ian Potter, Jeff Rowe and Charles Young with respect to the 1980's and 1990's and Belinda Abbott, Peter Barnard and David Wilson with respect to the history of the past two decades. We are most grateful to all of them for their input, feedback and support of this project. In addition, we especially thank Belinda Abbott, Terry Cardwell and Charles Young for supplying many additional photos for the Photo Gallery and for their help in identifying personnel in the

earlier photos. In particular, we also sincerely thank Belinda Abbott and Peter Barnard for the file of photos related to the La Trobe Chemistry 50th anniversary symposium and celebration/reunion dinner. We now believe that although we expect this project to continue to evolve, we have reached our objective in demonstrating how La Trobe Chemistry has achieved a record of excellence in teaching and learning, research and outreach/interactive activities, which has consolidated and strengthened its firm foundation established over the 1960's and 1970's and has generated and enriched a culture of confidence and anticipation of future growth and sustainability. Finally, we believe that this document belongs to all La Trobe Chemistry personnel past and present and that it is our legacy to them acknowledging that by their building of an outstanding academic record over half a century, a successful, exciting and productive future is assured for 'chemistry' at La Trobe University.

September 2017

ADDENDA

LaTrobe Chemistry Academic Staff

by Year and Level of Appointment

Topsom R.D.	1966 E	Blackmore M.	1967 A
Cardwell T. J.	1967 B	Cattrall R. W.	1967 B
Dale D. H.	1967 B	Davis M.	1967 B
Deady L. W.	1967 B	Kingston J. V.	1967 B
Mackie J. C.	1967 B	Magee R. J.	1967 E
Morrison J. D.	1967 E	Woodburn S. I.	1967 A
Broxton T. J.	1968 A	Kendall M.	1968 RF
O'Connor M. J.	1968 RF	Peel J. B.	1968 B
Smith J. F.	1968 RF	Ternai B.	1968 RF
Reiss J.A.	1969 B	Arthur N.L.	1969 B
Mackay M.F.	1969 A	Nyberg G.L.	1969 B
Kaiser E.	1969 A	Slater S.J.E.	1969 A
Considine R.	1970 A	Brownlee R.T.C.	1970 RF
Hill J.O.	1970 RF	Davy J.D.	1970 A
Tariq S.A.	1970 A	Wedd A.G.	1971 B
Grant M.W.	1972 RF	McCall M.	1972 A
Rowe J.E.	1974 A	Wilson R.B.	1974 RF
Christie J.R.	1975 B	James B.D.	1975 RF
Traeger J.C.	1975 RF	Derrick P.J.	1975 B
Stepan S.	1975 RA	Pirzada N.	1976 RA
Masters A.F.	1979 RF	Iskander M.N.	1979 RA
Lim K.H.R.	1979 RA	Morris J.L.	1979 RA
Shoppee C.W.	1981 Hon E	Beveridge R.J.	1981 RA
Pullen G.R.	1981 RF	McLoughlin R.G.	1981 RF
Bailey T.D.	1983 RF	Chandler C.J.	1984 RF
Carnovale F.	1984 RA	Goss S.P.	1985 RF
Kibel M.F.	1985 RF	Farchione F.	1985 RA
Iles P.T.	1985 RA	Millikan M.B.	1985 RA
Young C.G.	1986 B	Mathieson A.	1986 Hon E
Anderson S.E.	1987 RF	Skorobogaty A.	1987 RF

Validorf J.	1987 RF	Wang D.	1987 RF
Bellinger G.C.	1987 RF	Rothwell R.G.	1988 RF
Gengenbach T.	1988 RA	Greenwood R.J.	1988 RA
Traill P.	1988 RA	Stragalinou A.	1989 A
Chiu F.C.K.	1989 RA	Walker G.S.	1989 RA
Bond A.M.	1990 E	Culvenor C.C.J.	1990 Hon E
Cooper J.A.	1990 RF	Pfund T.	1990 RF
Schmit T.	1990 RF	Ayhan M.	1990 RA
Cross G.	1990 RA	Eagle A.A.	1990 RA

Szczepanski S.	1990 RA	Colton R.	1992 C
Cook M.C.	1992 RF	Hazi J.	1992 RF
Mocak J.	1992 RF	O'Connell R.G.	1992 RF
Shen W.	1992 RF	Brown R.	1994 RF
Sadek M.	1994 RF	Shaw S.	1994 RF
Zhang X.	1994 RF	Hughes A.B.	1995 B
Kalinitchenko I.	1996 RF	Kolev S.	1996 RF
Desneves J.	1997 RF	Kaye A. J.	1998 RF
Godfrey M.C.S.	1998 RF	Chen J.	2000 RF
Quazi N.	2001 RF	Potter I.D.	2003 B
Hogan C.F.	2003 B	Wilson D. J.	2005 A
Abbott B.M.	2006 B	Richards A.F.	2009 B
Mechler A.I.	2009 C	Robertson E.G.	2009 C
Barnard P.J.	2009 B	Dutton J.L.	2009 B
Abrahams C.	2010 A	Crosby I.	2011 B
Huth S.	2011 A	Spencer M.	2011 B
Smith B.J.	2012 D	Young C.G.	2013 Hon D
Kaur M.	2014 A	Hinds M.	2015 D
Bayat S.	2015 RF	Ennis C.	2016 B

LaTrobe Chemistry Support and Technical Staff

ADMINISTRATIVE ASSISTANTS

Denise Worthington, Vanessa Paproth, Ros Wright, Heather Mackay, Dianne Samson, Dianne (Quigley) Brown, Lynn Dawson, Colleen Duggan, Margaret Richards, Fay Traianou, Sue Mullins

LABORATORY MANAGERS

Arch Gallagher (d. 2010), Jean Brown, Debbie del Frate, Sharon Harris, Michael Imsic

CHEMISTRY STORE MANAGERS

Jim Kendrick (d. 1995), John Mathews, Brad East

LABORATORY TECHNICIANS

Ray Loft, George Greer, Graeme Butt, Barbara Pleasance, Ian Potter, Debbie del Frate, Alan Jeffry, Graham Bratspies, Barry Hodkinson, Greg Egan, Cecile Vlastuin, Terry Paproth, Helen O'Hara, Margarita Bakalova, Linh Quan

MECHANICAL WORKSHOP

John Chipindall, Don Balaam, Eric Goodwin, Daryl Huntington,

David Fillerty, Terry Ryan, Frank Brogno, John Reukers

GLASS ENGINEERING

Alf Ramsden, Michael Koppenol, Frank Pedersen

ELECTRONICS/IT

George Haertel (d.1993), Ian Shaw (d. 2017), David Annear, Ian Thomas

AUDIO-VISUAL

Les Stafford, Jessie White

La Trobe Chemistry completed PhD's by year of graduation

1971

Geoff Scollary

1972

David Cameron, Peter Gray, Robert Shanks, Stephen Slater, John Traeger

1973

Robert Dromey, Mahmood Khwaja, Naseem Peerzada

1974

Andrew Burns, Paul Harrison, Jeffrey Hughes, Philip McDonough,

Robert Martin, Lothar Satzke, Greg Sceney

1975

David Davey, Lawrence Gahan, Enno Homfeld, Emelia Krankovits, Ram Lakhan,

Frank Leng, Jeffre McDonell, Soon Beng Teo.

1976

Dusk de Fontaine, Peter Jessup, Leslie Johnson, Chin-Poh Pui

1977

John Bromilow, Robert Hyde, David McIvor, Gary Willett**,**

Ian Boyd, Mushtaq Ahmad, Gavin Ewin, Magdy Iskanda, Donald McGilvery,

1978

Kingsley Cavell, Yook-Tau Pang, Michael Pettett, Victor Talbot

1979

Bookhari Annuar, George Domazetis, Muhammad Fayyaz, Martyn Kibel,

David Leach, Barry Meehan, Jill Morris, Pamela Oliver

1980

Frank Carnovale, David Craik, Neil Duddy, Tiang Gan, Anthony Graddon,

Phillip Marriott, Russell McLoughlin, David Rogers, Iraj Salarzadeh

1981

Julie Bradbury, Paul Cacioli, Ainul Daud, David Hey, Mirna Ilic,

Anne Josem, Peter Nichols, Tai-Chin Woon

1982

Lean Geat Lee, Waldemar Mazurek, Michael McLeish, Geoffrey Mitchell,

Paula Newitt, Dianne Smith

1983

Olga Korytsky, Michelle Livett, Gregory Neumann, Robert Payne,

Maruse Sadek, Graeme Smith

1984

Ramalan Bin-Ahmad, Wayne Finlayson, Simon Goss, Jon Hall, Graeme Hanson,

Trevor Lorman, Mary Millikan, Rohani Paiman

1985

Stephen Anderson, Nelly Buckman, Christopher Chandler, Stephen Gheller,

Stephen Roe, Phil Shehan, Hume White

1986

Christine Sindt, Raymond Spokas, Kenneth Tonkin, Wen-Yang Wu

1987

Mohamed Bin-Othman, Iain Cook, Peter De Munk, Andrew Kellock,

Aldo Lentini, Peter Lovelace, Richard Rothwell, Keith Stanney

1988

Silvano Colmanet, Luisa Cook, Peter Hauser, Robert Hook, Michael Kony,

Somchai Pengprecha, Clyde Rodrigues, Stojan Stojkovski,

Peter Traill, Peter Tse, Dianne Werden, Graham Wilson

1989

Dominico Caridi, Shubra Chandra, John Issa, llias Kyratzis, Ashton Partridge

1990

Roland Chung, Florian Del Mundo, Jacqui Gulbis, Robert Symons

Sallyanne Wright, Zheng-Feng Zhao

1991

Guo-Nan Chen, Roland De Marco, Gloria Karagianis, Chiang Li, Wei Shen

1992

Peter Iles, Ian McKelvie, Abdul Wahoud Al-Khalek, Kathryn Woodburn,

Xiao Zhiguang

1993

Qing-Ping Chen, Robert Mrzljak, Sergio Scrofani

1994

Michael Godfrey, Sheng-Ping Ma, Nurul Quazi

1995

Frank Bambino, Zhong-Tao Jiang, Ian Potter, Jose Santos, Ellak Von Nagy-Felsobuki

1996

Jose Desneves, Grace Gregorio, Barbara Kompe, David Way, Richard Webster

1997

George Argiropoulos, Melinda Christophersen, Graeme Cross,

Zlata Ivanov, Anthony Kaye, Kaylene Raynes, Jacqueline Walter

1998

Jun-Jie Chen, Antonella D'Agostino, Xue-Dong Wang, Kellie Windahl

1999

Lilibeth Coo, Anthony Dole, Bradley Mulroney, Damien Newcombe

Hong-Da Shen, Hermin Sulistyarti

2000

Xian-Yong Bu, George Khairallah

2001

Luke Miles, Thomas Rodemann, Michelle Spencer

2002

Sami Sheikheldin

2003

Martha Kalkanidis, Thusitha Rupasinghe,

Silvana Santomartino, Li-Juan Wang

2004

Luigi Aurelio, Jason Dang, Andre Klein, Anastasios Polyzos,

Sakchai Satienperakul, Brad Sleebs

2005

Shane Devine, Michael Rogers

2006

Zoe Harvey, Marianne Sleebs

2008

Oliver Montagnat, Chai-Ann Ng, Christopher Verdon

2010

Reshmi Kiran, Daniel Oehme,

2011

Elizabeth Ankers, Gregory Barbanti, Pietro Barilla,

Rani Maharani, David Piper, Ellen Reid

2012

Elisse Brown, James-Robert Cram, Egan Doevan

2013

Martin Brzozowski, Van Quan Ho

2014

Nathan O'Brien, Jacqui Delaney

2015

Devin Benheim

2016

David Bower, Melissa Buskes, Kathy Chan, Shannon Couchman,

Sarah Laird, Isabella Lobo, Thomas Pell, Rania Seoudi, Swappa Varghese

2017

Antonio Aprile, Dayne Georgiou, Kalon Iverson, Brad Stronger, Kel Vin Tan

MAX O'CONNOR MEMORIAL LECTURE presenters by year

1991 Glen Deacon 1992 Bruce West 1993 Ron Dickson

1994 Tony Wedd 1995 Bob Cattrall 1996 Bob Brownlee

1997 Tony Masters 1998 Barrie Peel 1999 Terry Cardwell

2000 Charles Young 2001 Not awarded 2002 Keith Murray

2003 Lawrence Gahan 2004 Neil Barnett 2005 Phillip Marriott

2006 David Craik 2007 Elak von Nagy-Felsobuki 2008 Roland De Marco

2009 Ian McKelvie 2010 Alan Bond 2011 Paul Francis

2012 Not awarded 2013 Trevor Hambley 2014 Brendan Abrahams

2015 Michelle Spencer 2016 Jacqui Gulbis 2017 Spas Kolev

ACKNOWLEDGEMENT

We gratefully acknowledge Isabella Milevski and Giselle Roberts

for uploading this final edition of the Chemistry History Project

onto the 'La Trobe 50th Anniversary' and 'LIMS' websites

and also for promoting it internally and externally.

September 2017

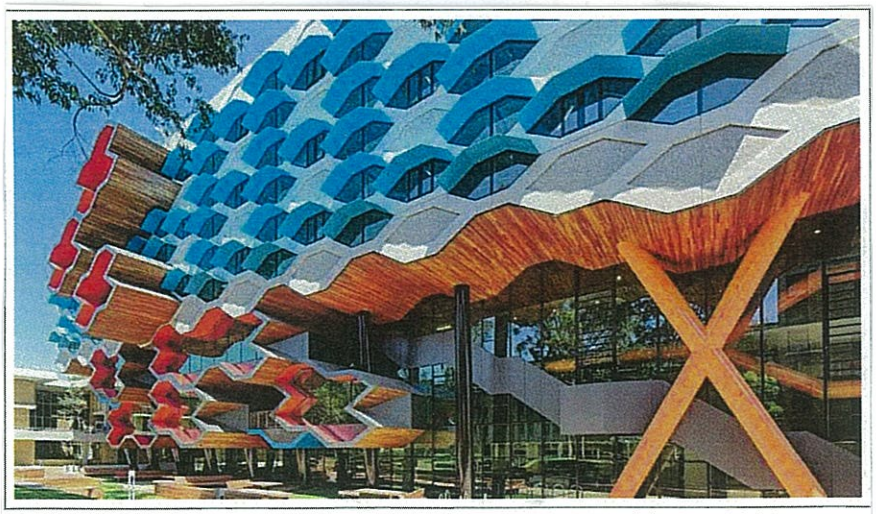
50 Years of Chemistry at La Trobe University

Early construction at the Bundoora Campus: 1967

Construction of Chemistry Building (PS3): 1968 -9: Library Stage 1 in background

PS3 construction viewed from Kingsbury Drive: 1968 - 9

Chemistry Building viewed from upper Agora: c 1980's



La Trobe Institute for Molecular Science LIMS1 Building c 2013

ACADEMIC AND SUPPORT STAFF AND POSTGRADUATES 1968

Back Row L→ R: Les Stafford, Robert Martin, Terry Cardwell, Mike Blackmore, Arch Gallagher, Unknown, Kevin Donchi, Don Balaam, Unknown, Ray Loft, Jim Kendrick, John Traeger, John Fisher, Lothar Satski, George Greer, Bob Catrall

Front Row L→ R: Sam Woodburn, John Kingston, Lynn Dawson, Heather Mackay, Bob Magee, Denise Worthington, Muriel Kelly, John Chippindale, Alf Ramsden

ACADEMIC STAFF, HONOURS AND POSTGRADUATES 1968

Back Row L → R: G. Morgan, G. Scollary, P. Gray, A. White, D. Muller, I. Cody, Robert Martin, Terry Cardwell, Ken Peverill, Lothar Satzki, John Traeger, Robert Shanks, John Fisher, Steve Slater

Front Row L → R: Mike Blackmore, Sam Woodburn, John Kingston, Bob Magee, Bob Cattrall, Keith Avery, Emelia Krankovits

DEPARTMENT OF CHEMISTRY STAFF AND POSTGRADUATES c 1990

Chemistry staff and postgraduates 2009: Andrew Hughes (Front Row centre) HOD

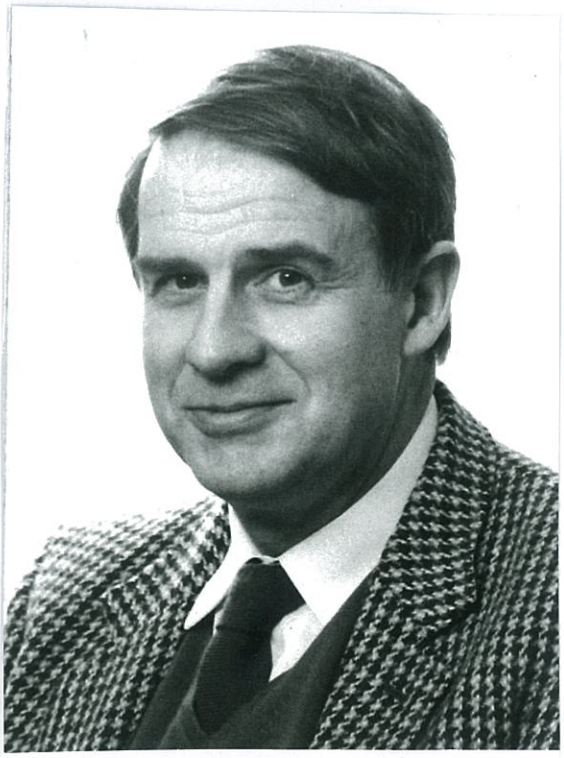
La Trobe University Department of Chemistry (Bundoora) and School of Pharmacy (Bendigo) Staff and Students - November 2010

Front L-R: Dr David Morton, Dr Bob Brownlee, Dr Conor Hogan, Dr David Wilson, Dr Peter Barnard, Dr Ian Potter, Dr Adam Mechler, Dr Seb Marcuccio, Dr Evan Robertson

Middle L-R: Rens Mensink , Tyson Belz , Arthur Zavras, Dr Jasim Al-Rawi, Nghi Nguyen, Lakmini Ambaruppa, Van Nguyen, Rani Maharani, Kim Duong, Ellen Reid, Sarah Laird, Elisse Browne, Jacqui Delaney, Dr Anne Richards

Back L-R: Rick Morrison, Nathan O'Brien, Christopher Thurm, James-Robert Cram, David Bower, Melissa Buskes, Isabella Lobo, Lori Ferrins, Jacob Heppell, Saleh Ihmaid , Egan Doevan, Daniel Oehme , Martin Brzozowski, David Leaver, Devin Benheim

Bob Magee



Ron Topsom

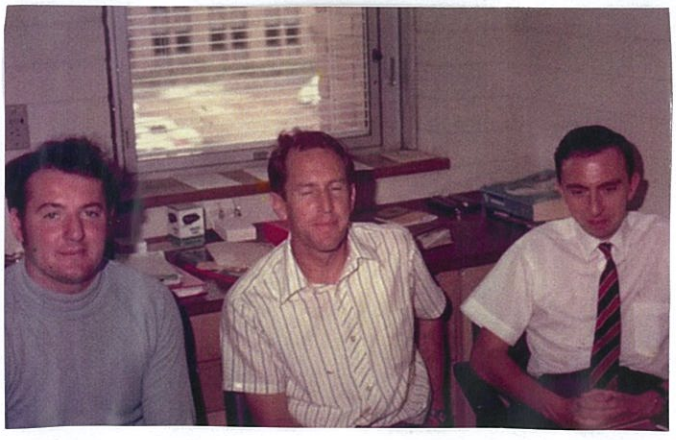
Jim Morrison

Jim Morrison (2nd from L), Bob Brownlee (3rd from L), Andrew Hughes (2nd from R), Jeff Rowe (Far R) c 2013

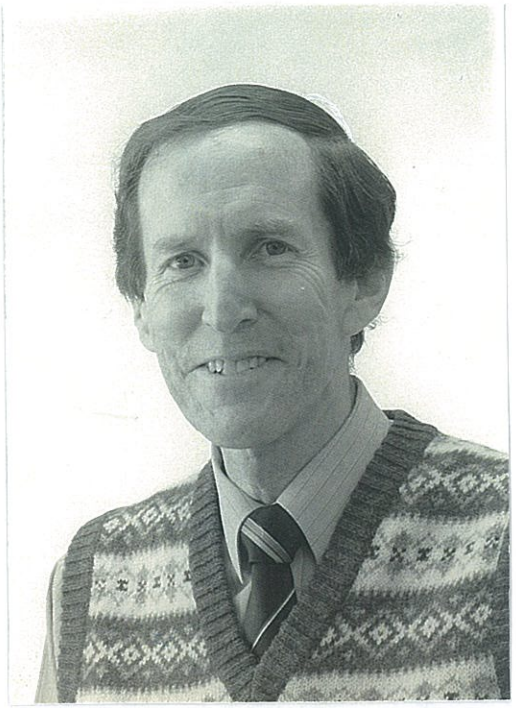
Maureen Mackay - mid 1970's

Maureen Mackay in X-Ray Crystallography centre:
mid - 1970's

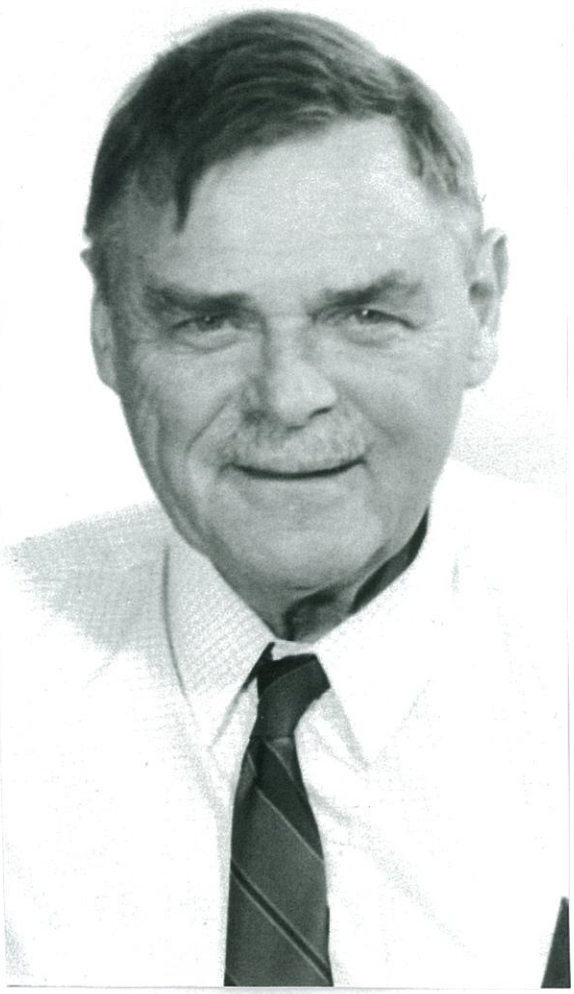
Naseem Pirzada (2nd from L), Shabbir Tariq (Far R)



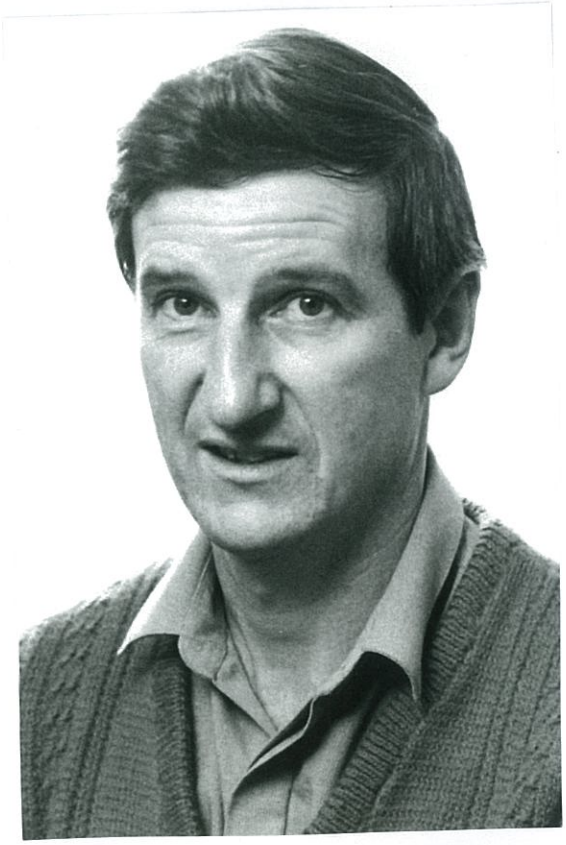
Owen Aubrey (MSc 1974), Max O'Connor, John Hill



Max O'Connor

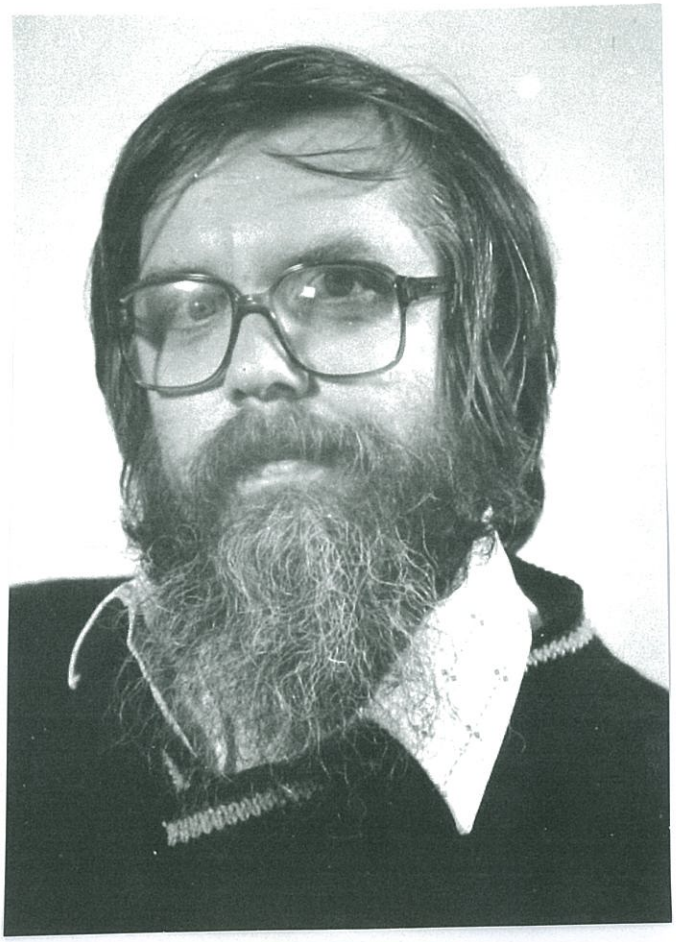


Sandy Mathieson



Les Deady

Mike Davis

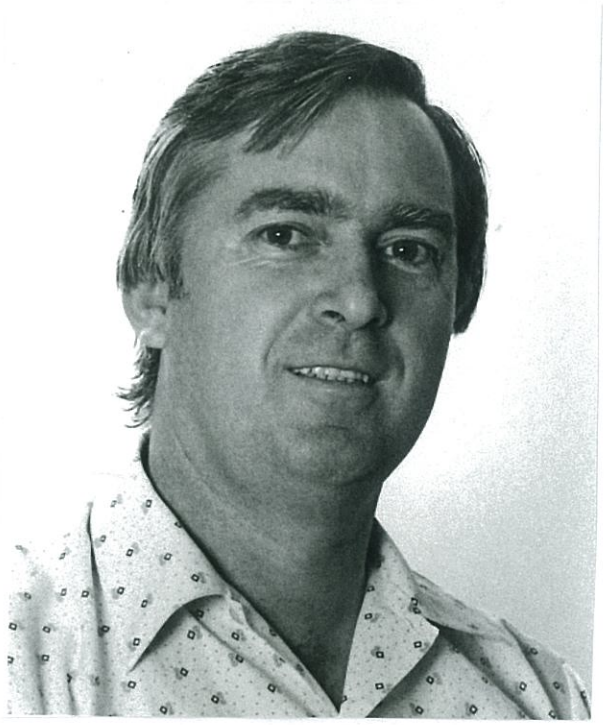


John Christie

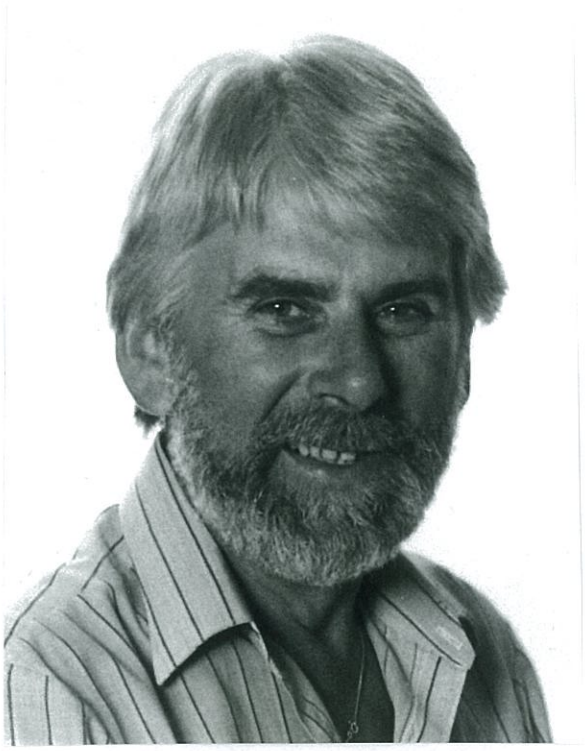
John Hill

Bela Ternai

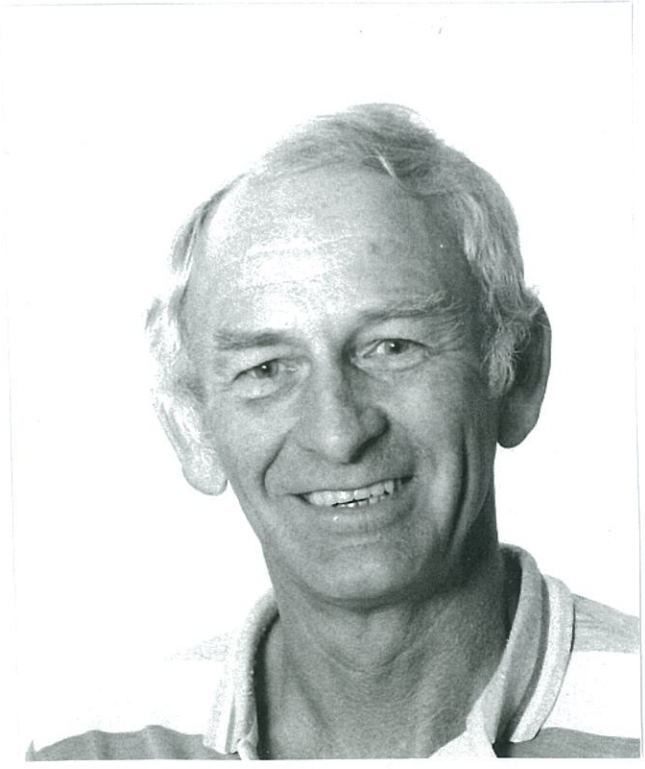
Bruce James



Daryl Huntington

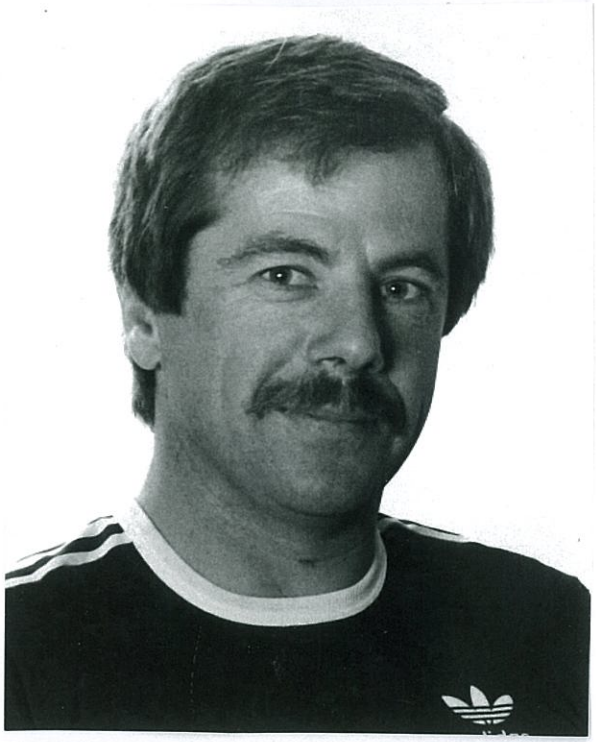


John Reukers



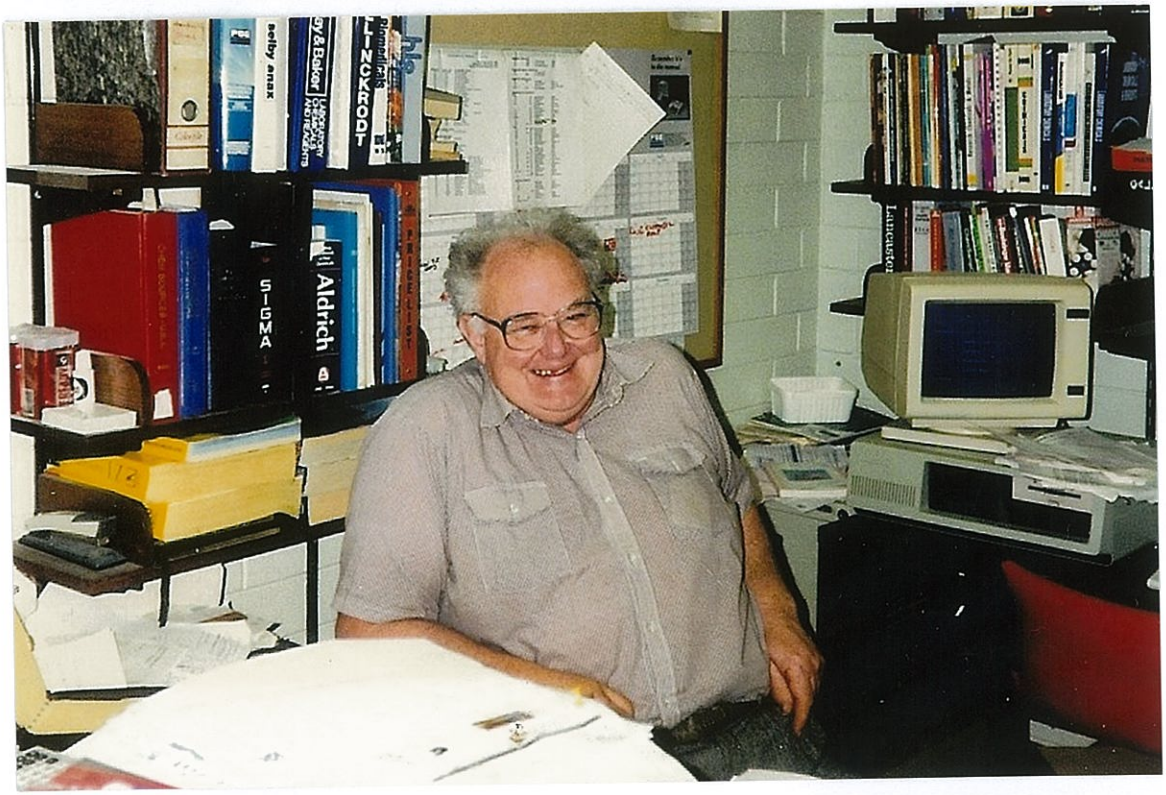
Eric Goodwin

Frank Brogno



David Fillerty

John Mathews



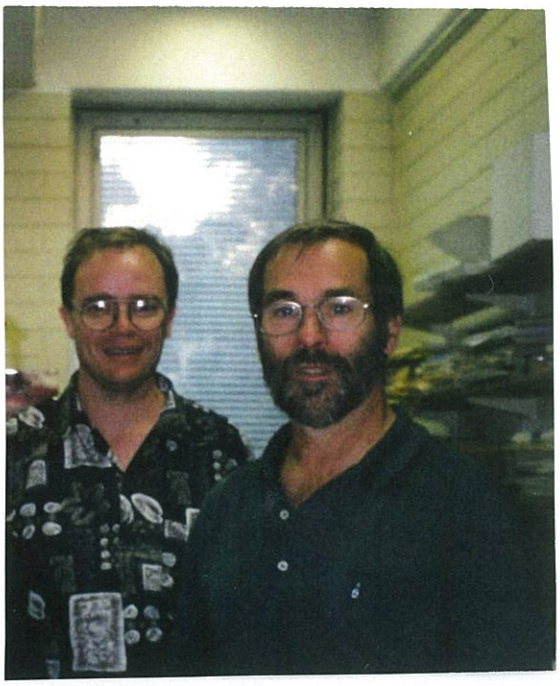
John Mathews at his desk in the Chemistry Store

George Haertel

Ian Shaw

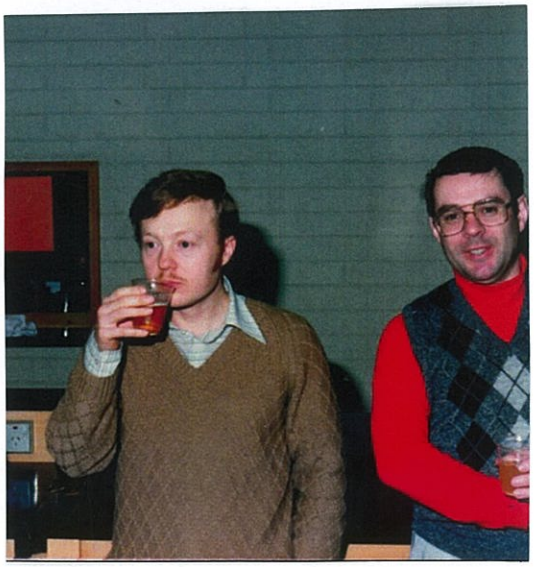
Ian Shaw, Debbie del Frate,
Daryl Huntington

Greg Egan

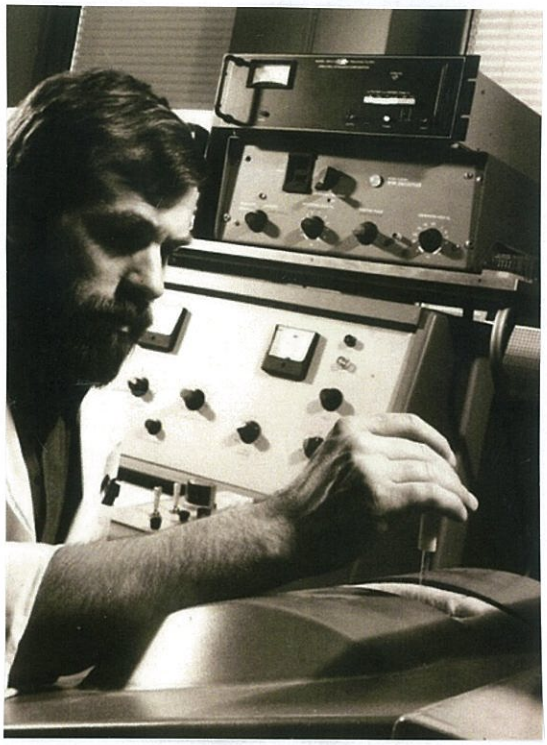


Ian Thomas, Graeme Butt

Graham Bratspies



Alan Jeffry, Graham Bratspies



Graeme Butt: A 60 NMR, c 1975

Terry Paproth

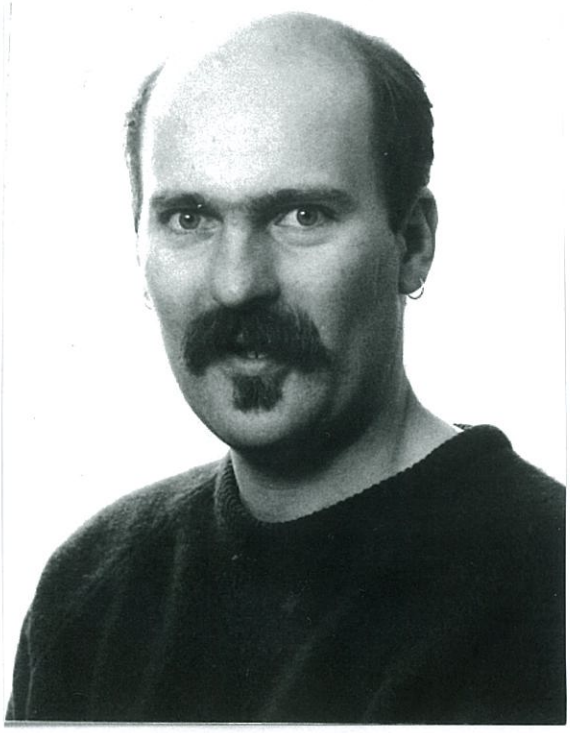
Arch & Muriel Gallagher c 2000's

L → R: Jeff Hughes, Enno Homfeld, John Fisher, Owen Aubrey, Dianne Quigley Brown, Dianne Samson, Vanessa Paproth, Heather Mackay, Lynn Dawson

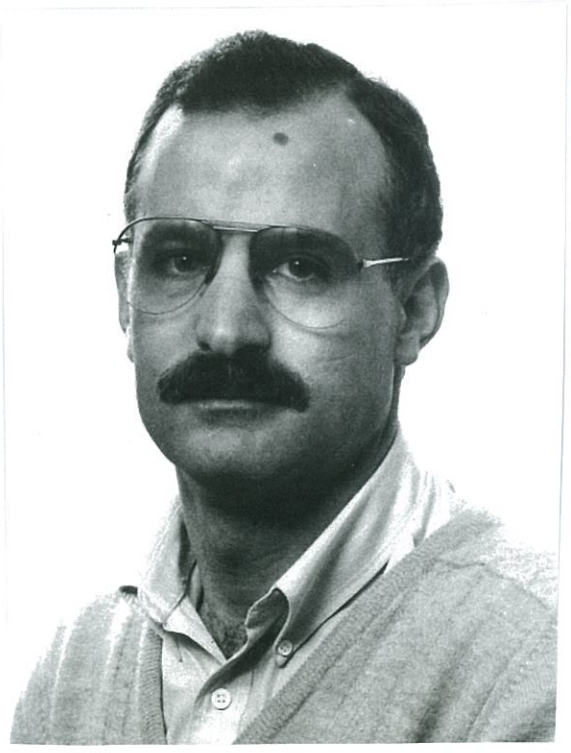
Debbie del Frate

Margaret Richards

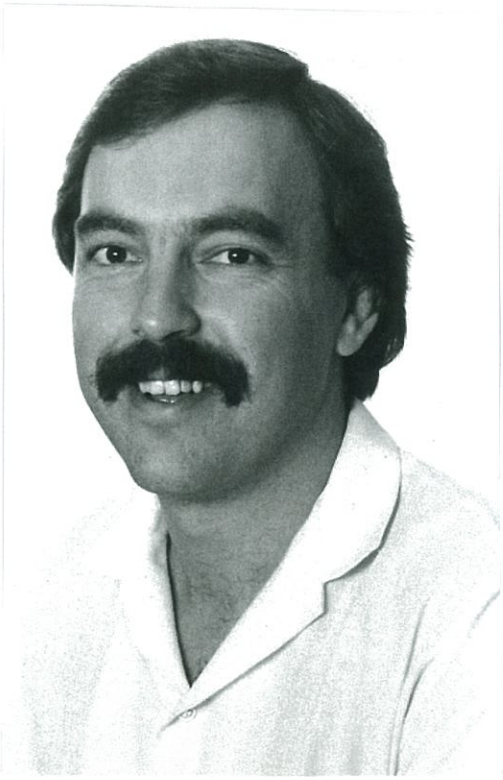
Colleen Duggan



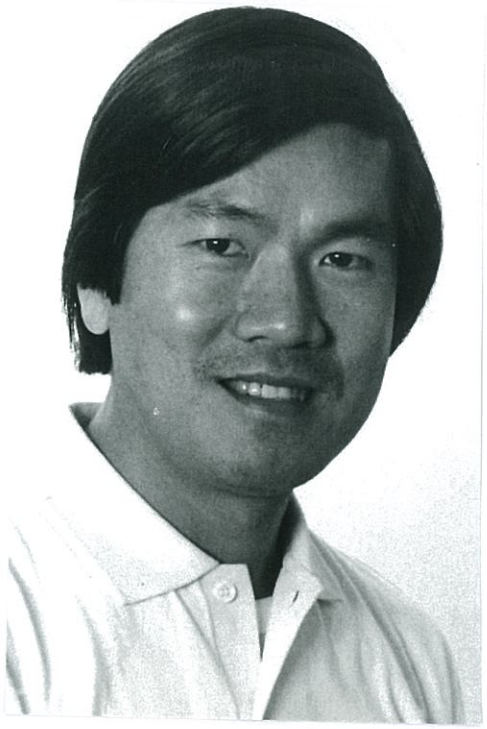
Simon Goss (PhD 1984)



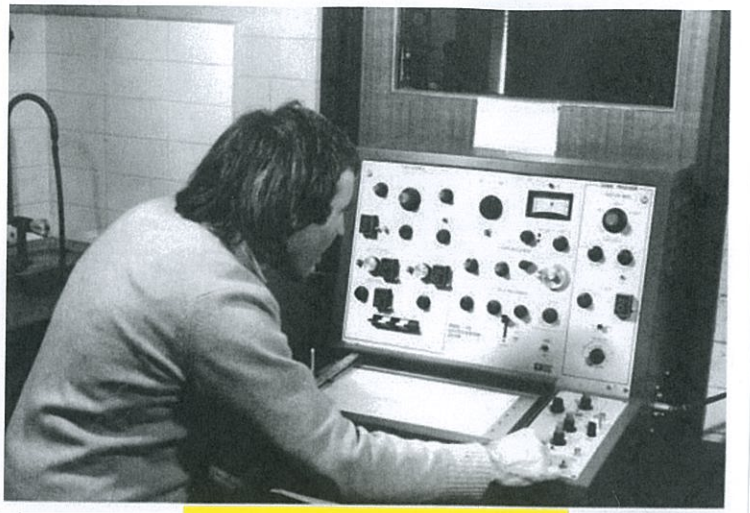
Frank Carnovale (PhD 1980)



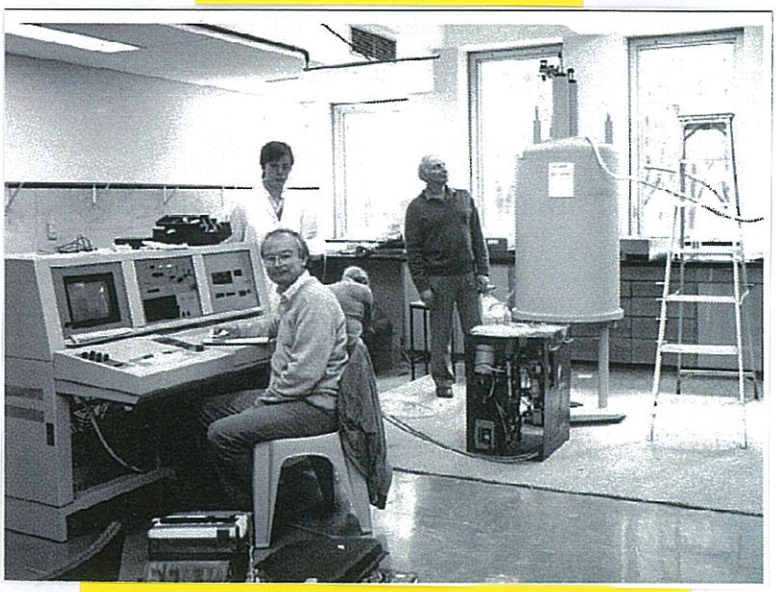
Chris Chandler (PhD 1985)



Paul Pui (PhD 1976)

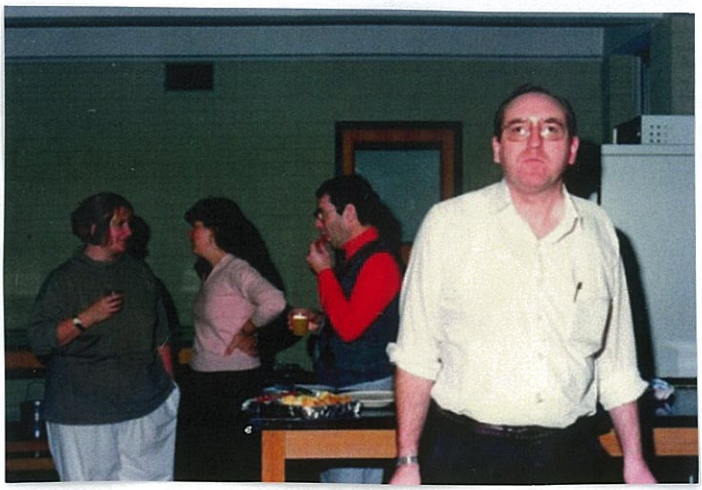


Victor Talbot (PhD 1978)



Bob Brownlee, Ian Thomas, Ian Shaw:
NMR Centre c 1980's

Seb Marcuccio (seated) c 1974



Jessie White, Debbie del Frate, Graham Bratspies & Bruce James: 1990

Sandy Mathieson, Mike Koppenol, Daryl Huntington, Frank Brogno & Frank Bambino (PhD 1995): 1990

Frank Pederson, Eric Goodwin, Fay Traianou, Zhiguang Xiao & Bruce James: 1990

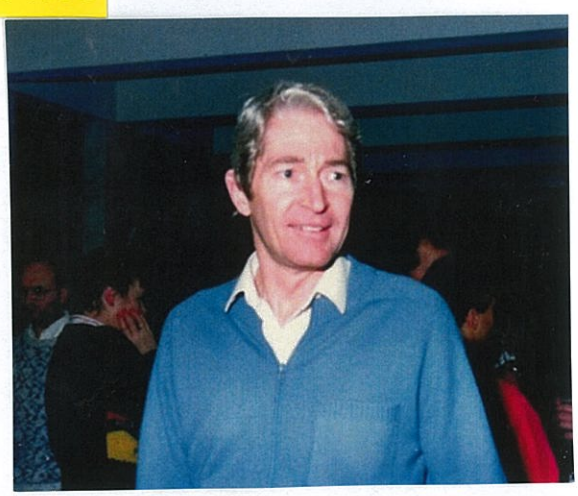
Ian McInerney, Keith Barnard: 1990

Richard Greenwood (MSc 1992), Mustafa Ayhan (RA 1990) & Sergio Scrotani (PhD 1993)

Shengping Ma (PhD 1994) & Xue Feng Yan (Hons· 1990)

Michael Godfrey (PhD 1994) with Open Day visitors: 1995

John Hill & Bob Brownlee: 1990

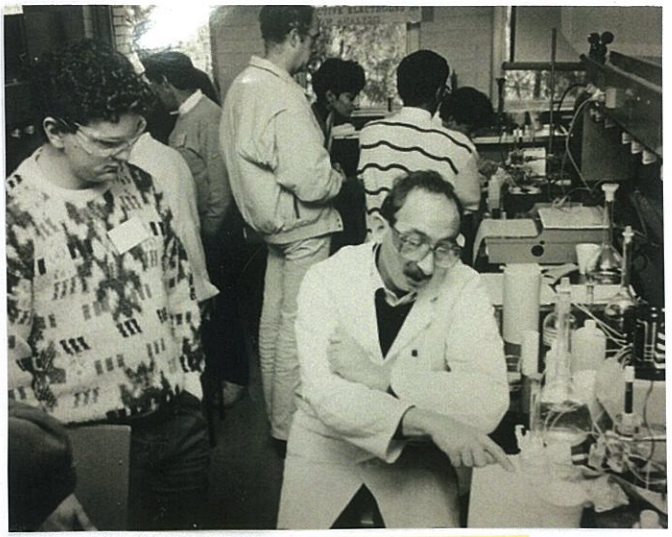


Graeme Nyberg: 1990

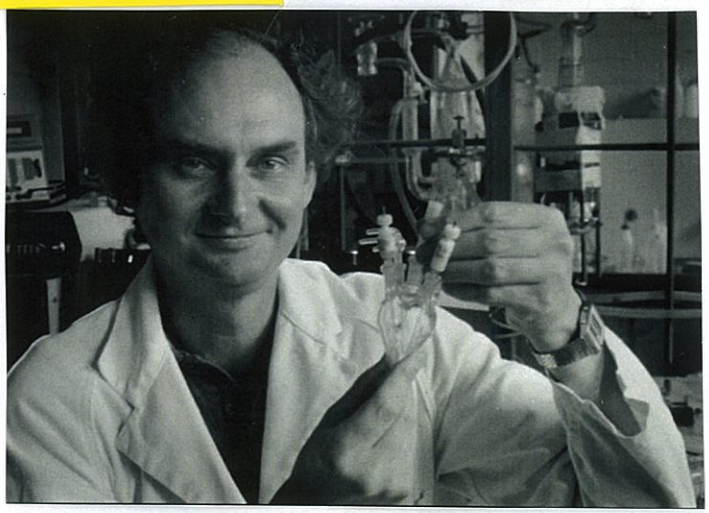
Ian McInerney, Charles Young, Michael Koppenol: 1990

Iris Manton & Jeff Rowe: 1990

Unknown PG, Charles Young & Ian Potter



Peter Iles: Open Day 1992

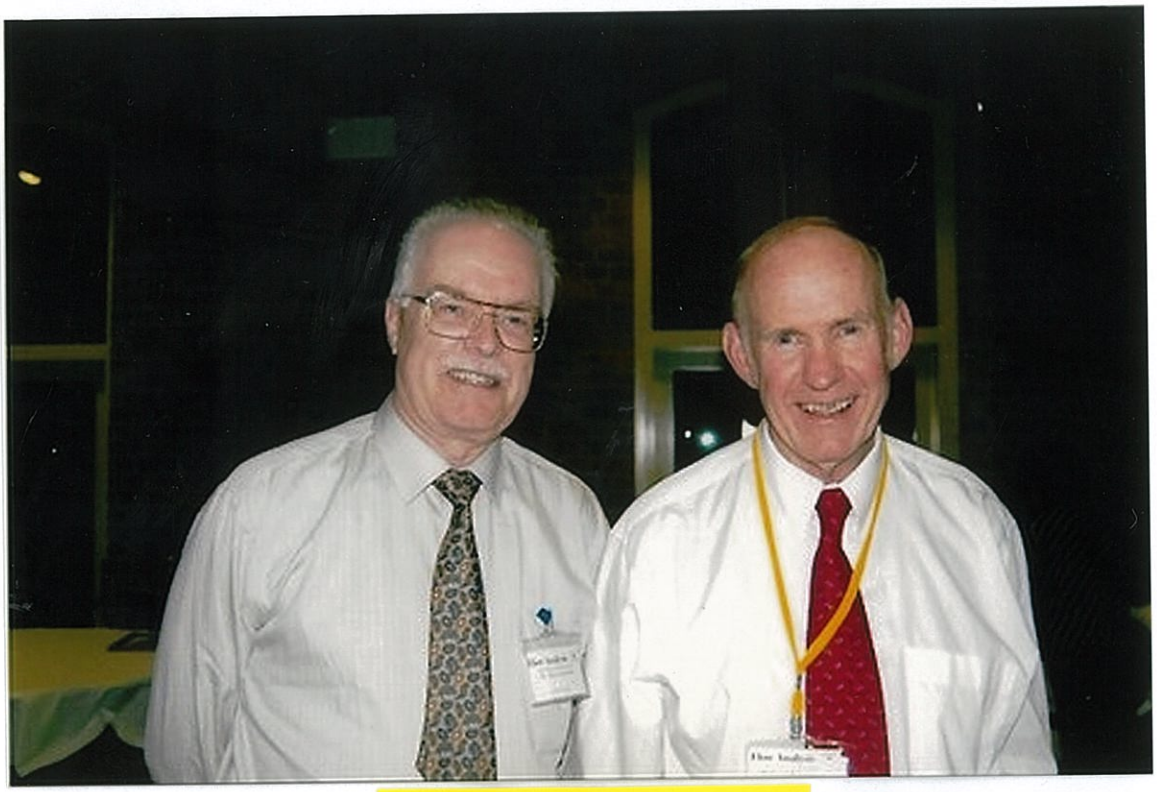


Alan Bond: c 1990

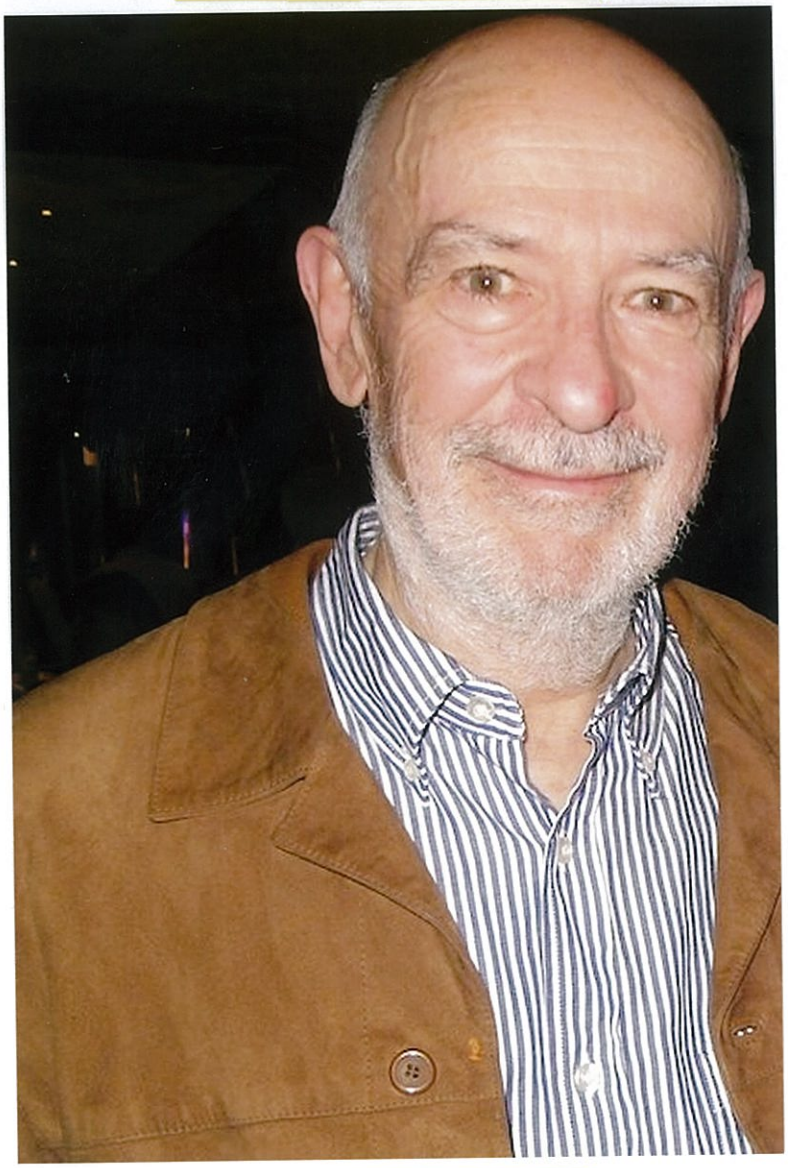
Bob Cattrall, Terry Cardwell, Ian Hamilton & Dominic Caridi: mid 1980's

Spas Kolev, Bob Cattrall & Neville Arthur: mid 1990's

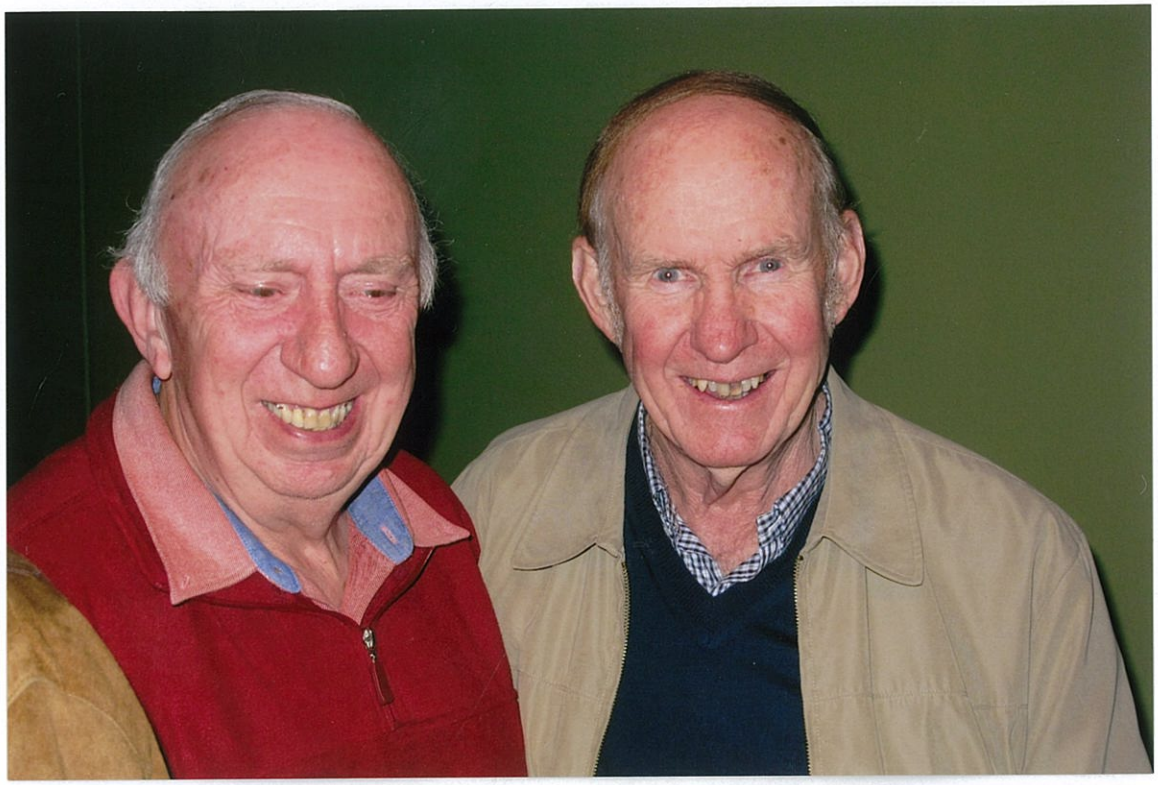
Neville Arthur: Open Day 1995



Terry Cardwell & Bob Cattrall:
late 1990's



Tony Wedd: 1990's

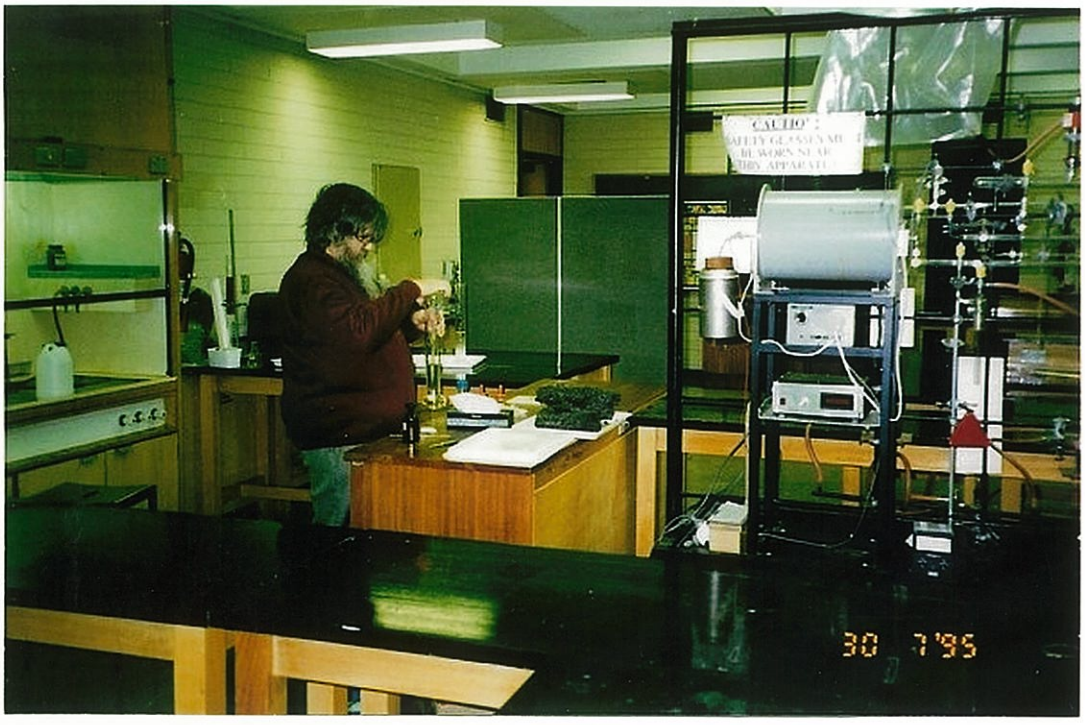


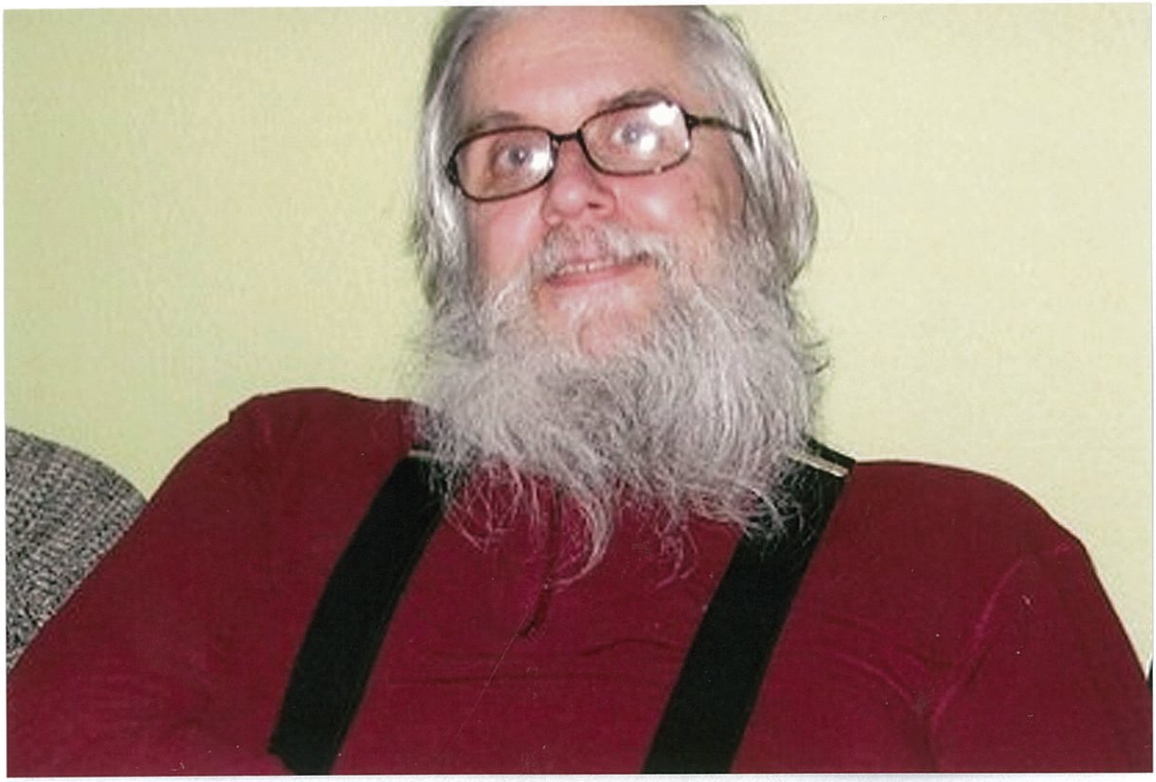
John Hill & Bob Cattrall: late 1990's

Ian Thomas & Jim Reiss

John Christie: Open Day -

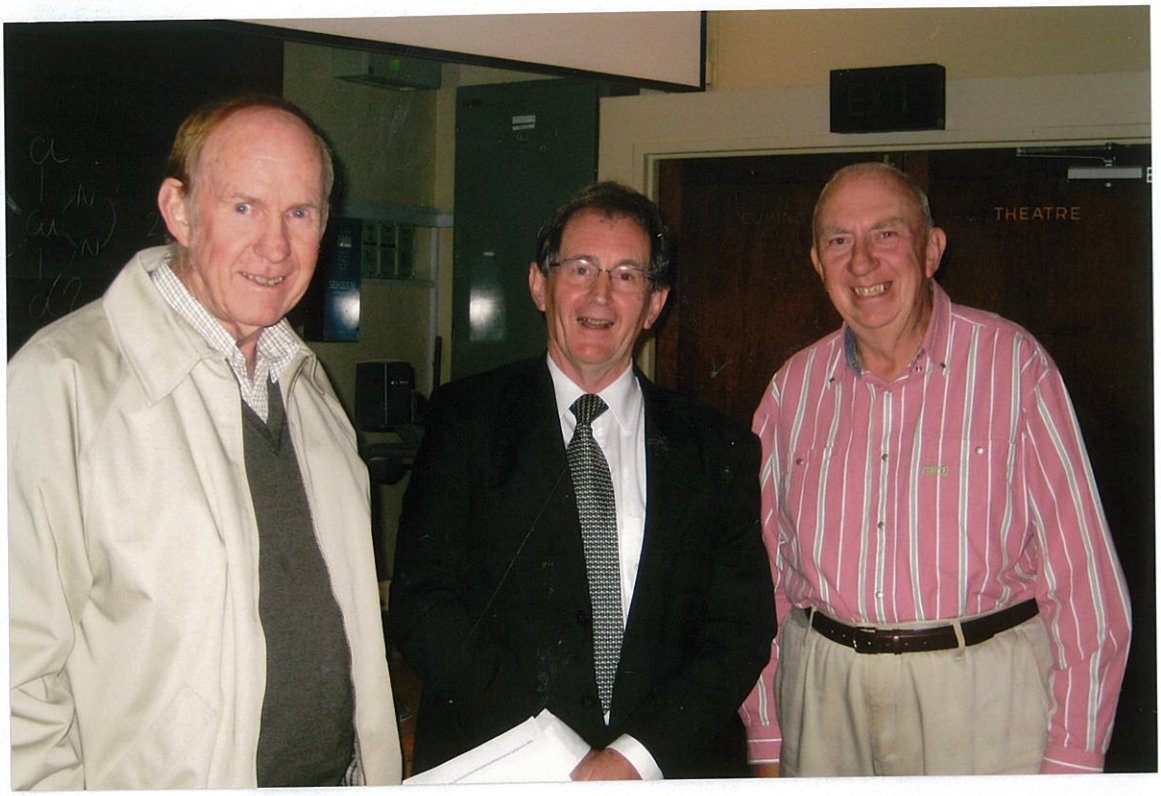
Chemical Magic Show: 1995





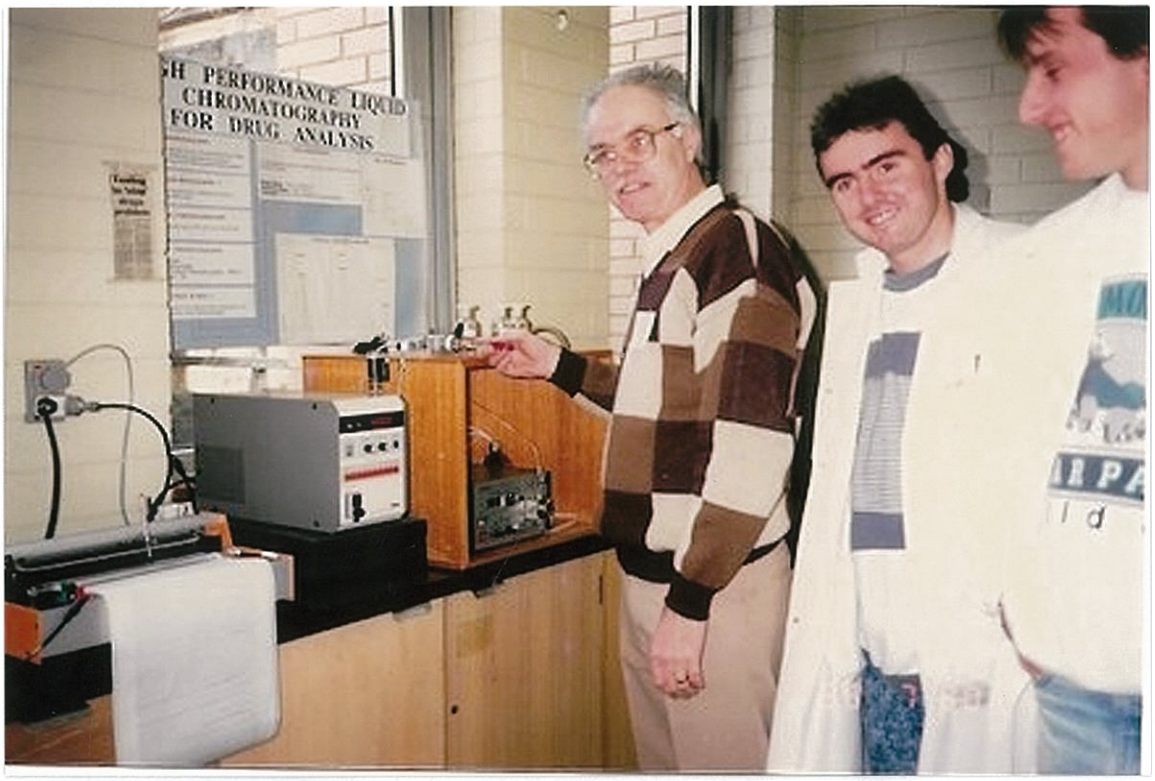
John Christie: late 1990's

Ian McKelvie & Spas Kolev (Don Phillips in background)

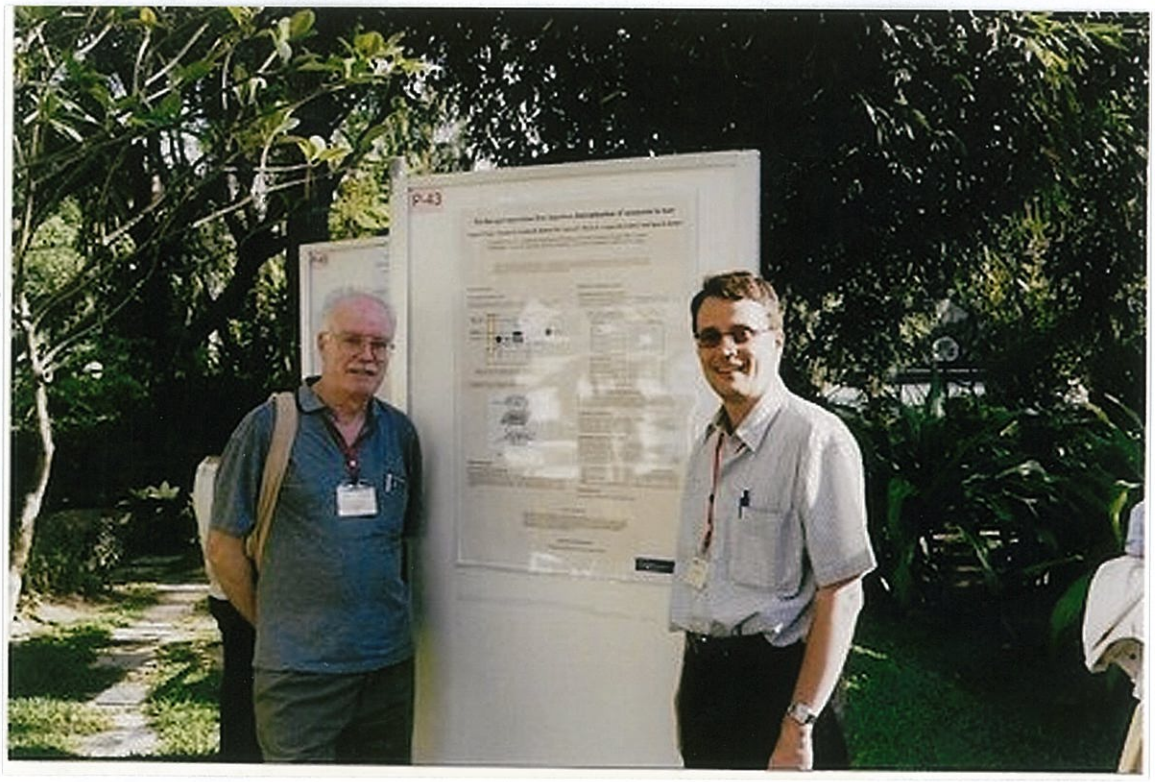


Bob Cattrall, Geoff Scollary & John Hill

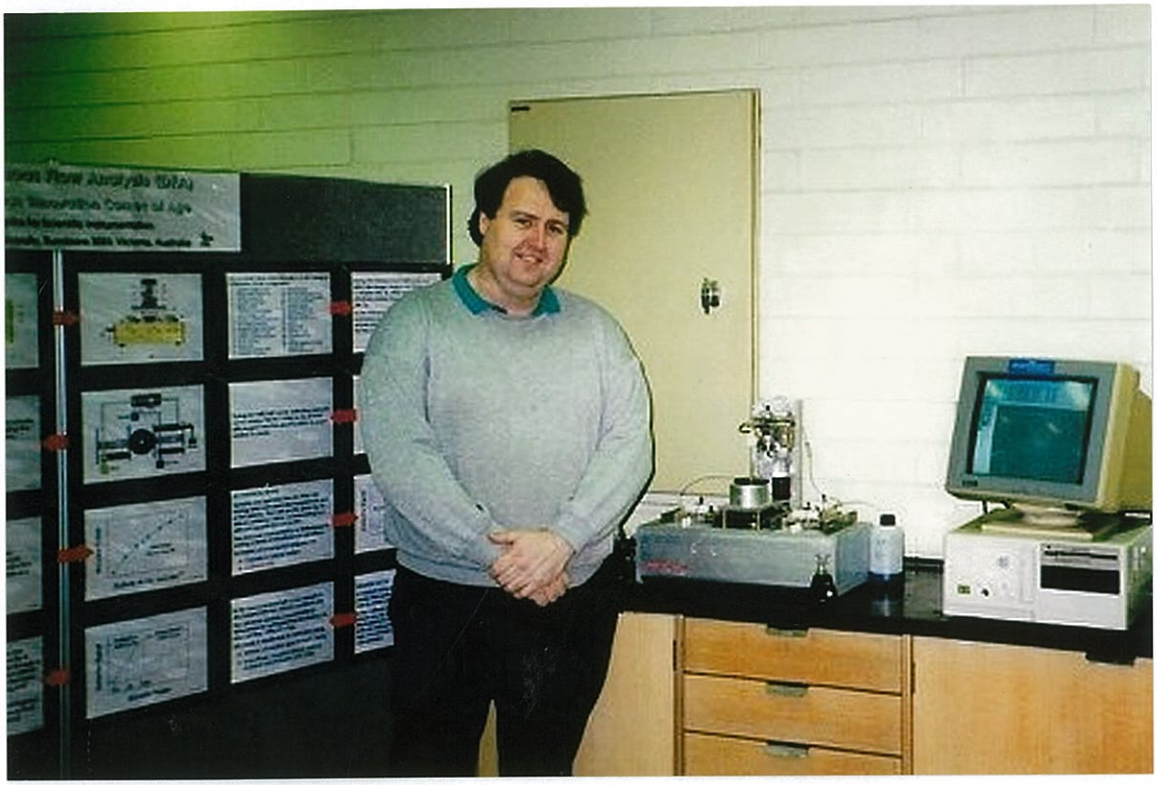
Robert Mrzlljak (PhD 1993) &
Roland de Marco (PhD 1991)



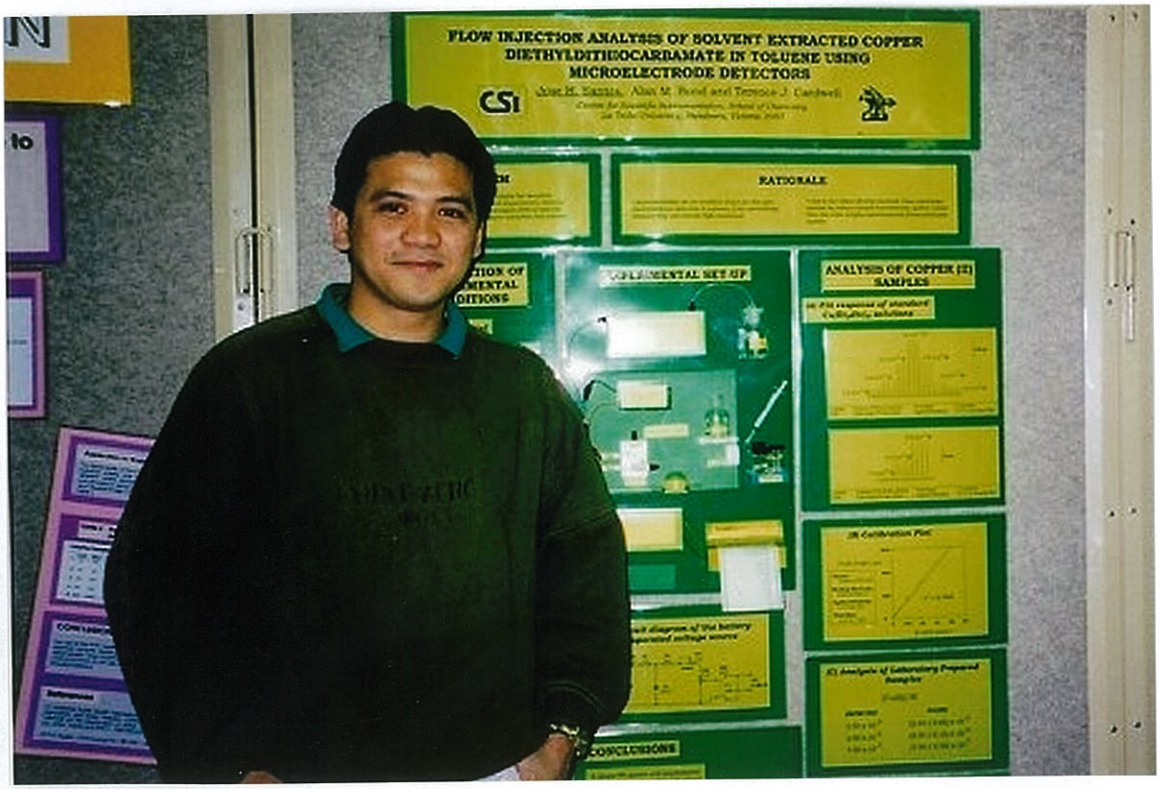
Terry Cardwell: Open Day 1980's



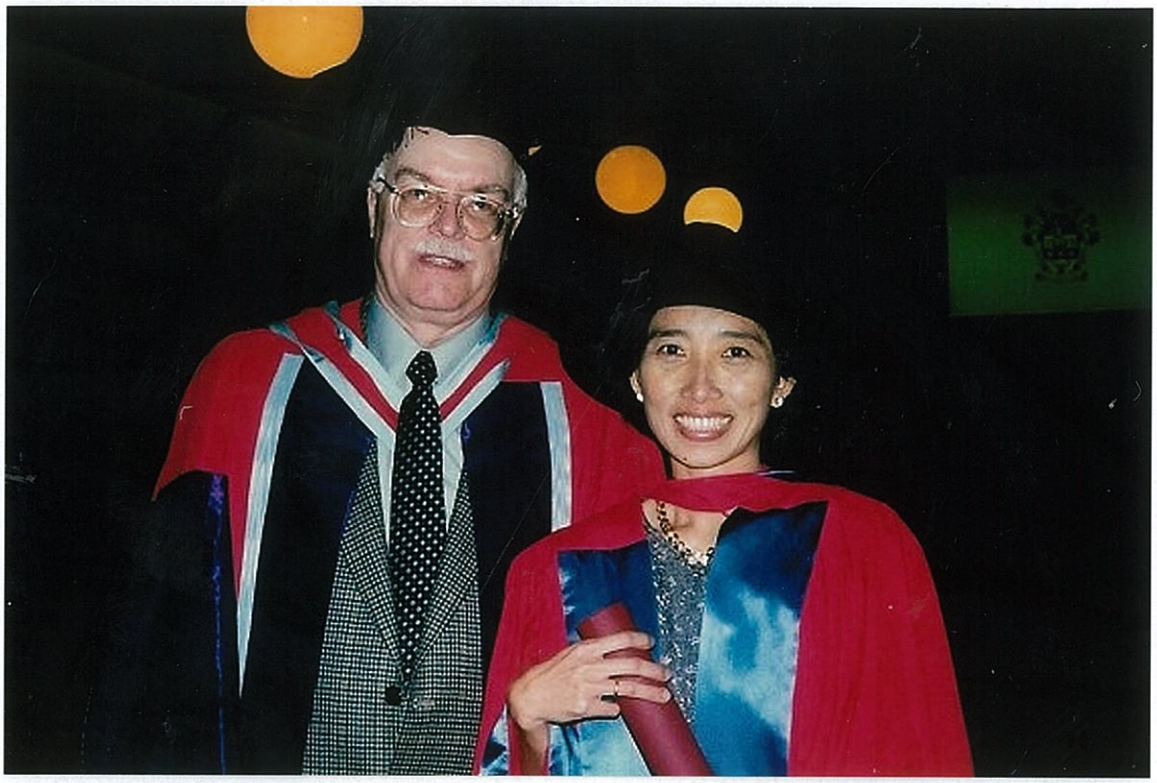
Terry Cardwell & Spas Kolev: Poster presentation at conference in Chiang Mai, Thailand: 1990's



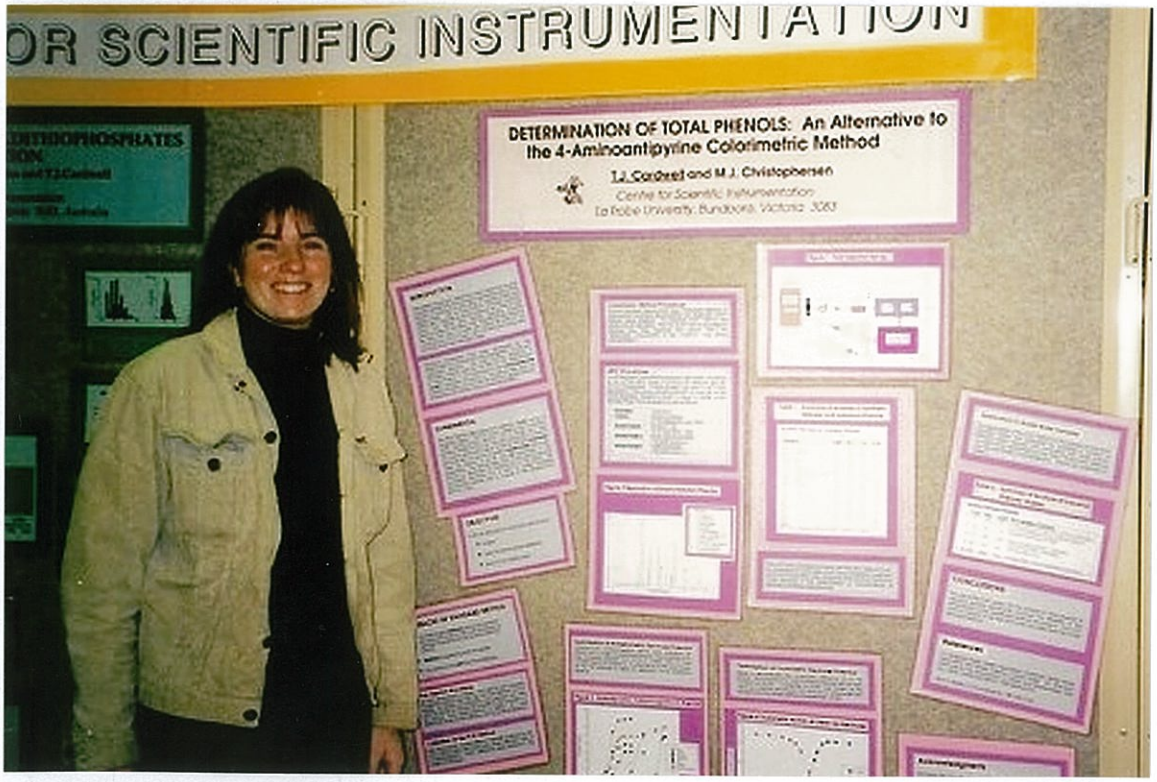
Greg O'Connell (RA 1992)



Joey Santos (PhD 1995)



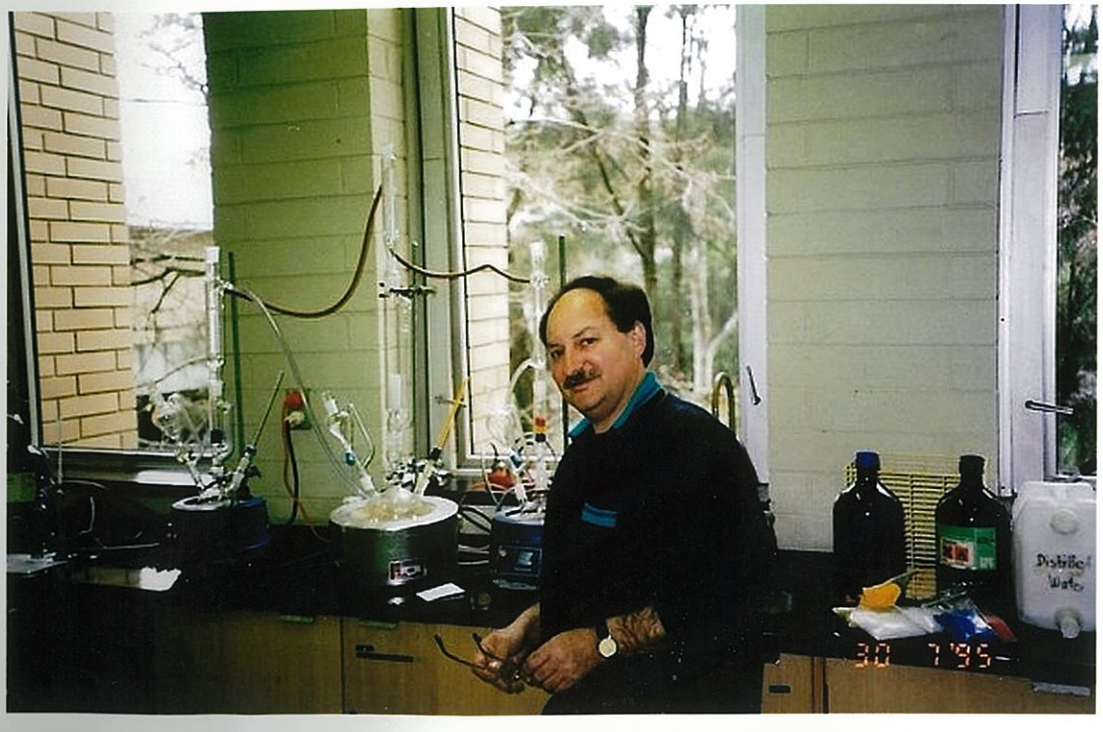
Terry Cardwell & Hermin Salistyarti
(PhD 1999)



Melinda Christophersen (PhD 1997)

Vivian Silverstroni (Kony) (MSc 1998)

Silvana Santomartino (PhD 2003)



Jeff Pura (Research Visitor): 1980's

Kellie Windahl (PhD 1998)

Sakchai Satienperakul (PhD 2004)

Cardwell/Cattrall group graduation: 1998

Cardwell/Cattrall Research Group: c 2000's

IDP Workshop in Inorganic Chemistry: Los Banos, Philippines: Charles Young, Bruce James & Peter Nichols (Monash) - Instructors

Terry Cardwell, Bob Cattrall & Spas Kolev: 2015

Charles Young: mid 1980's

Tony Wedd, Peter Traill (PhD 1988), Clyde Rodrigues, Charles Young: Chemical Magic Show: 1980's

Charles Young Research Group: 1991

Xue Feng Yan, Aston Eagle &
Les Laughlin

Young hiking group on Mt. Feathertop: Charles
Charles Young, Richard Rothwell, Tom Gegenbach,
John Enemark (University of Arizona) &
Richard Greenwood

Michelle Spencer (PhD 2001)

La Trobe Chemistry/Maejo Library Donation Ceremony: L → R: Sakchai Satienperakul, Phuenpom Niemsep, Bob Brownlee & John Hill : Chiang Mai: 2007

Molecular Design and Synthesis Theme Staff and Students – November 2010

Front L-R: Dr David Wilson, Rick Morrison, Dr Belinda Abbott, Elisse Browne, Dr Anne Richards, Dr Bob Brownlee, Arthur Zavras, Nghi Nguyen,

Middle L-R: Melissa Buskes, Jacob Heppel, Lori Ferrins, Dr Peter Barnard, Martin Brzozowski, Van Nguyen, Lakmini Ambaruppa, Rani Maharani, Saleh Ihmaid

Back L-R: Daniel Oehme, Nathan O'Brien, David Leaver, Rens Mensink, Dr Seb Marcuccio, Christopher Thurm, James-Robert Cram, Tyson Belz, Dr. Jasim Al-Rawi

La Trobe University Molecular Processes and Analysis Staff and Students – November 2010

Front L-R: Dr David Morton, Dr Conor Hogan, Dr David Wilson, Dr Evan Robertson

Middle L-R: Isabella Lobo, Kim Duong, Ellen Reid, Sarah Laird, Jacqui Delaney

Back L-R: David Bower, Egan Doevan, Devin Benheim, Dr Adam Mechler

Ian Potter, Adam Mechler & Evan Robertson: 2010

La Trobe University Teaching Award 2013 – 'Chemistry 1' Teaching Team: Evan Robertson, Adam Mechler, David Wilson, Carmel Abrahams & Ian Potter

OLT Award 2013 – 'Chemistry 1' Teaching Team: Margaret Gardner (Presenter), Adam Mechler, Ian Potter, David Wilson, Carmel Abrahams & Evan Robertson

'Team Capstone 2017'

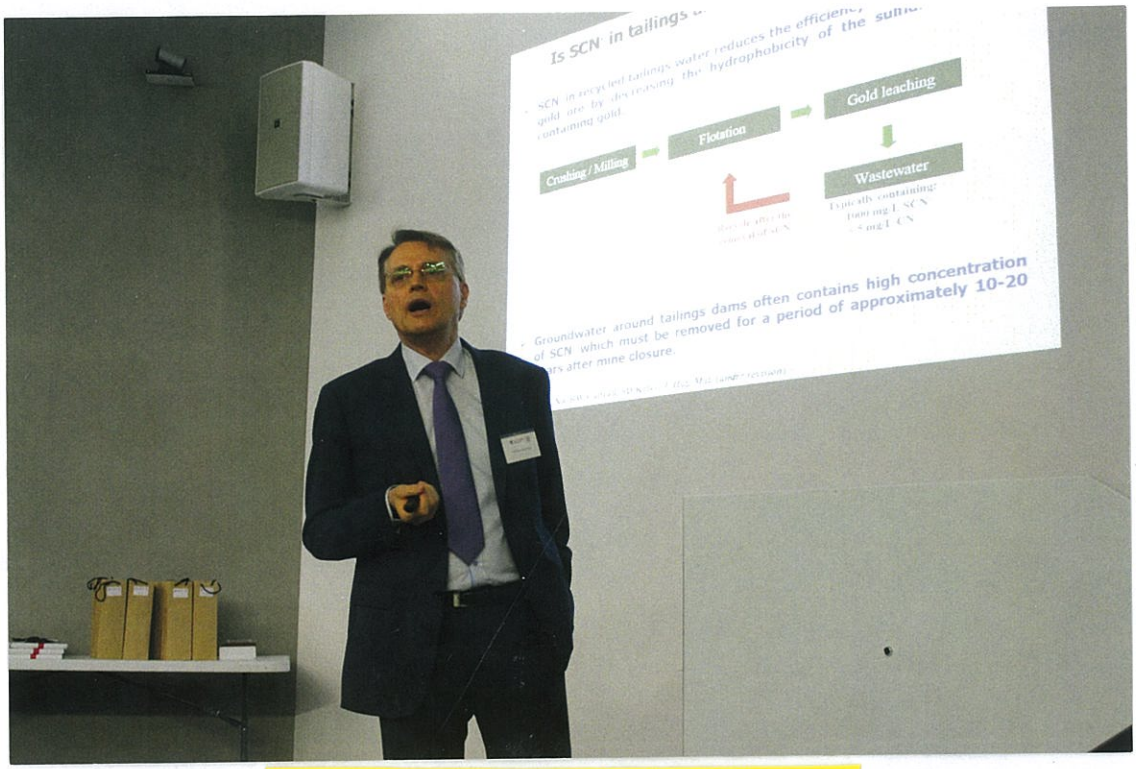
L → R: Mandeep Kerr, Jason Dutton, Peter Barnard, Belinda Abbott & Evan Robertson

LA TROBE CHEMISTRY 50th ANNIVERSARY SYMPOSIUM & CELEBRATION REUNION DINNER: 21 JULY, 2017

Symposium group photos

VC John Dewar's Opening Address

Symposium Chair: Peter Barnard



Spas Kolev presenting the Max O'Connor Memorial Lecture 2017

Jason Dutton thanks Phillip Marriott for his presentation

Jason Dutton thanks Melinda Christophersen for her presentation

Jason Dutton thanks Tony Wedd for his presentation

Carmel Abrahams thanks David Craik for his presentation

Carmel Abrahams thanks Jacqui Gulbis for her presention

Alan Bond delivering his presentation

Belinda Abbott thanks Anastasios Polyzos for his presentation

Belinda Abbott thanks Charles Young for his presentation

Lunch Break gathering

Seb Marcuccio and Wally Mazurek enjoying the Celebration/Reunion Dinner

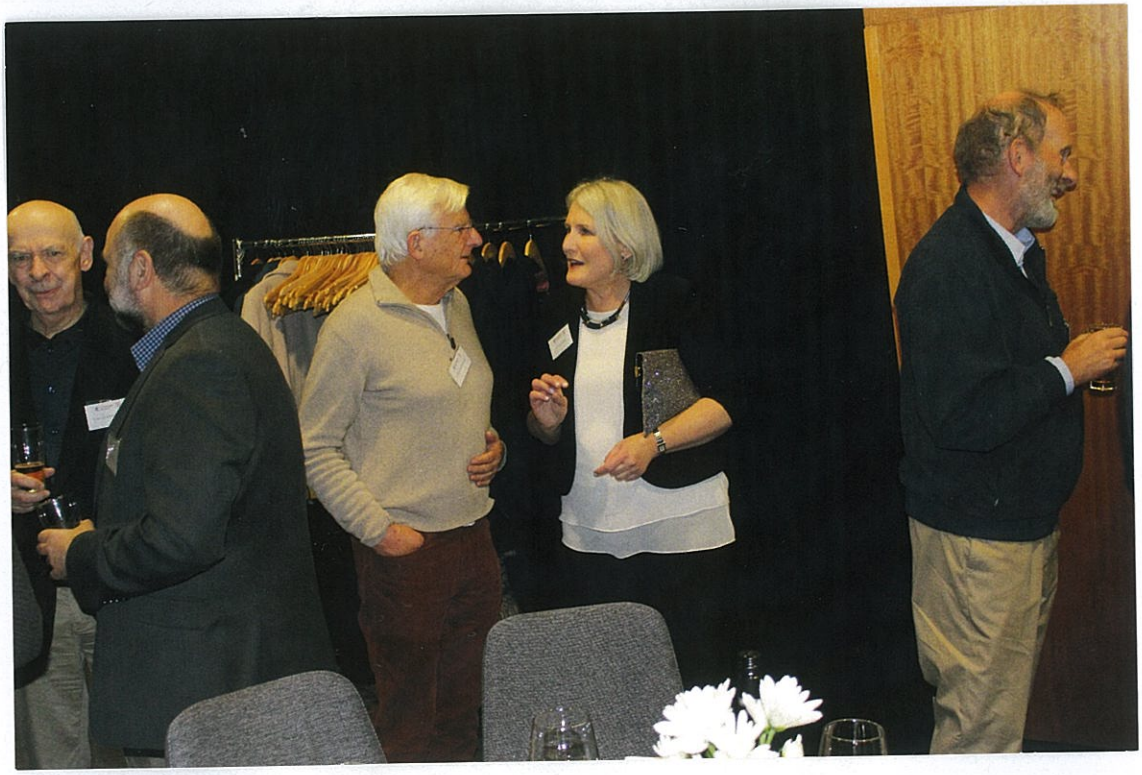
Brooke Young, Graham Wilson & partner & Charles Young

Conor Hogon, Anastasios Polyzos & Peter Barnard

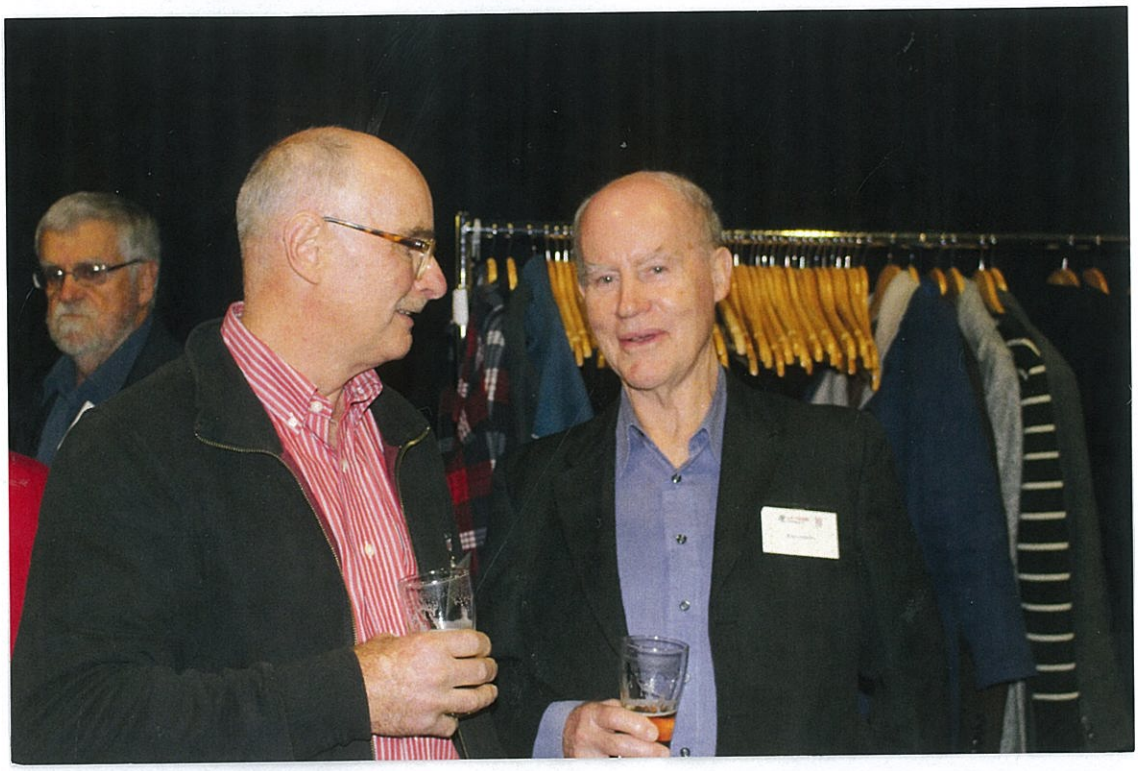
Odean Dining Room, Union Building

Terry Cardwell, Brooke Young & Zhiguang Xiao

Steve Slater, Jeff Hughes, Greg Sceney,
Robert Martin, John Traeger & Martyn Kibel

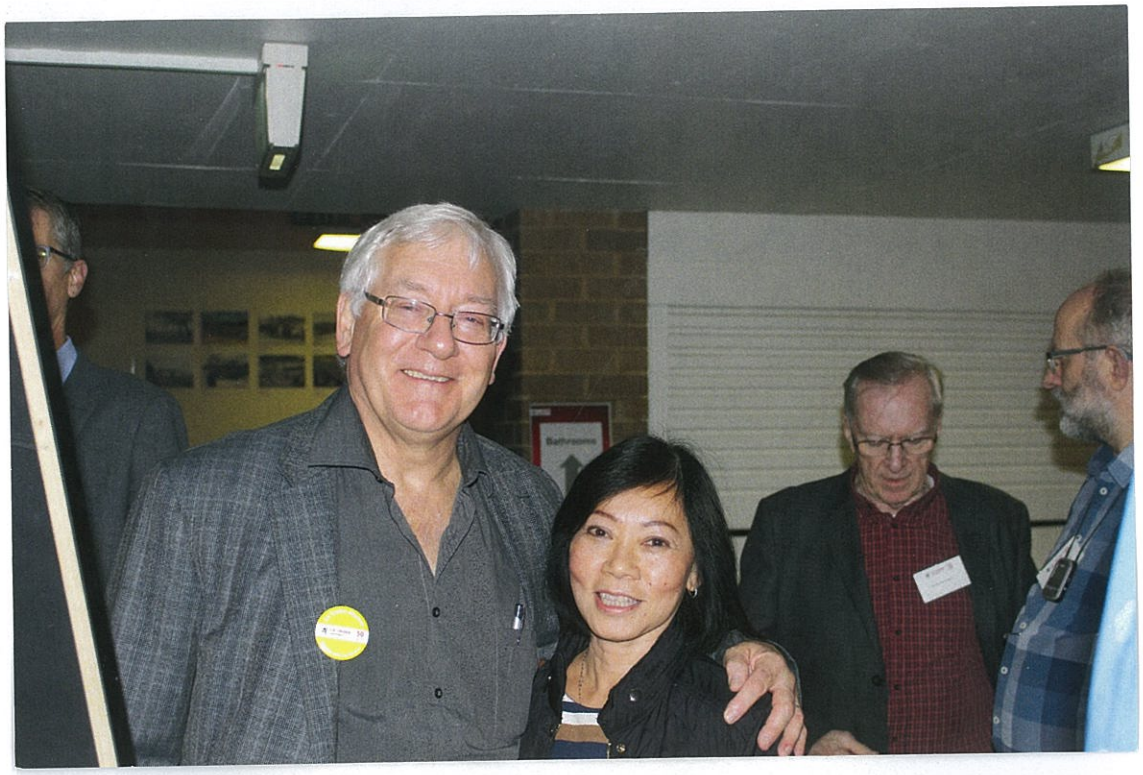


Tony Wedd, Michael Kony, Wally Mazurek,
Christine Sindt and Jeff Hughes



John Traeger & Robert Martin

Peter Cullis, Vivian & Michael Kony



Phillip & Nancy Marriott - Daryl Huntington and Richard Rothwell in background

Steve Slater, Robert Martin, John Traeger & Greg Sceney

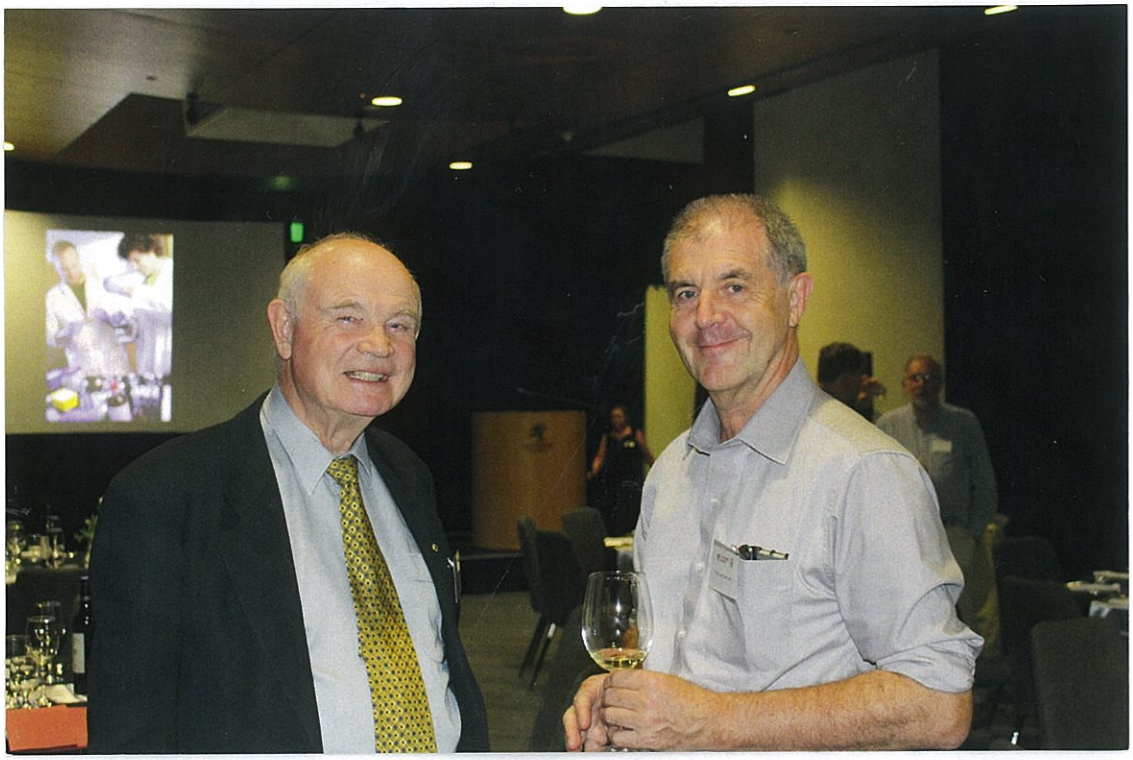
Brian Smith & Belinda Abbott

L → R: Damien & Belinda Abbott,
John Franceshini, Dianne Werden,
Colin Allison & Robert Martin

Dorothy & Barrie Peel

Charles & Brooke Young

Sue Wedd & Brooke Young



Bob Brownlee and David Craik

John Hill, Belinda Abbott and David Wilson

Dorothy & Barrie Peel

& Alan Bond

Phillip & Nancy Marriott, John Traeger &

Julie Rowe

John Hill, David Wilson & Peter Barnard

Daryl Huntington and Richard Rothwell

Sue Wedd, Bob Brownlee & David Craik

Bob Brownlee, Anastasios Polyzos & Seb Marcuccio

Terry Cardwell, Charles & Brooke Young & Graham Wilson

Margarita Bakalova, Jeff & Julie Rowe

Peter Barnard partner, Martyn Kibel,
Sue Wedd, Bob Brownlee, Belinda Abbott,
David Craik, Tony Wedd & David Wilson

David Wilson & Peter Barnard

Partner of Adam Mechler, Phillip Marriott and Christine Sindt

Alan Bond & Conor Hogan

David Wilson & Alan Bond

Zhiguang Xiao, Peter Cullis &
Daryl Huntington

Margarita Bakalova, Evan Robertson &
Adam Mechler

Brian Smith introducing Guest Speakers

Bob Brownlee

David Wilson

John Hill