

## ACADEMIC STAFF MATTERS

**The following joined the academic staff of the School during 2000 or took up new appointments in 2000:**

Dr V. Bennett	Fellow (previously Research Fellow), Geochronology and Isotope Geochemistry
Dr A. Berry	Research Fellow (previously Postdoctoral Fellow), Petrochemistry and Experimental Petrology
Dr J. Braun	Senior Fellow (previously Fellow), Geodynamics
Dr S. Eggins	Research Fellow (Fractional with Geology), Petrochemistry and Experimental Petrology
Dr A. Gorbatov	Postdoctoral Fellow, Seismology and Geomagnetism
Dr G. Hughes	Research Fellow (previously Postdoctoral Fellow), Geophysical Fluid Dynamics
Dr T.R. Ireland	Fellow, Geochronology and Isotope Geochemistry
Dr R.R. Loucks	Fellow, Ore Genesis
Dr C. Meriaux	Research Fellow, Geophysical Fluid Dynamics
Dr M. Palin	Research Fellow, Ore Genesis
Dr A. Reading	Research Fellow, Seismology and Geomagnetism

**The following left the academic staff of the School during 2000:**

Dr P.J. Johnston	Left his position as Research Fellow to take up an appointment with MITS Logica, Perth WA.
Dr S. Zhang	Left his position as Research Fellow to take up an appointment with the Department of Education, Training and Youth Affairs, Canberra, ACT.

## COLLABORATION WITH AUSTRALIAN UNIVERSITIES

Dr R.A. Armstrong continued a collaborative project on provenance of sediments from the Centralian Basin with Dr A. Camacho of the **University of New South Wales**.

Dr A.J. Berry continued to work with Dr E.R. Krausz, Research School of Chemistry, **the Australian National University**, on the study of fluid inclusions by optical absorption spectroscopy.

Dr M. Bird collaborated with Dr B. David, **Monash University**, Dr J. Balme, **University of Western Australia**, Dr B. Roberts, **La Trobe University**, and Dr J. Field, **University of Sydney** on the radiocarbon dating of archaeological sites in Australia. He also worked with Dr B. Witt of the Gatton Campus of the **University of Queensland** on carbon-isotope records of environmental change recorded in wool.

Professor J. Chappell undertook a collaborative project in the Flinders Ranges with Professor M.A.J. Williams of **Adelaide University** and Dr D. Adamson of **Macquarie University**, determining the nature, extent and palaeoclimatic implications of newly-discovered Late Pleistocene wetland deposits. He also gave a series of lectures over a week as Distinguished Lecturer at the School of Geography and Geology, **University of Wollongong**. In partnership with Dr M. Bird, he collaborated with Dr B. Witt of the Gatton Campus of the **University of Queensland** on carbon-isotope records of environmental change recorded in wool and shearing-shed dung accumulations.

Professor S.F. Cox is supervising **University of Newcastle** PhD students, Mr K. Ruming and Ms T. Wilson. He is also collaborating with Dr M. Knackstedt (jointly at the **University of New South Wales** and **The Australian National University**) in the development and application of percolation theory to modelling fluid flow in hydrothermal systems. He is also collaborating with the latter in the development of x-ray tomography facilities to characterise fracture and pore geometries in deformed rocks. Moreover, together with Dr J. Streit, National Centre for Petroleum Geology and Geophysics, **University of Adelaide**, he is preparing a joint work on the evolution of fracture geometries in deforming rock analogue materials. In May, he presented part of a workshop to Masters students and minerals industry participants at the CODES Special Research Centre at the **University of Tasmania**.

Mr C.M. Fanning collaborated with Associate Professor C. Fergusson, **University of Wollongong** on the Anakie Inlier of Queensland, Professor C.J. Wilson and Mr S. Boger, **University of Melbourne** on the age and evolution of the southern Prince Charles Mountains, Antarctica, Dr G. Clarke and Mr N. Kelly, **University of Sydney** on the age and evolution of eastern Enderby Land, Antarctica, and with Dr D. Gray and Ms C. Spaggiari, **Monash University** on the age of blueschist rocks from Victoria.

Dr M. Gagan continued collaboration with Ms A. Mueller and Dr B. Opdyke, Department of Geology, **the Australian National University** to reconstruct the palaeoceanography of the eastern Indian Ocean using stable isotope ratios in corals and foraminifera. Collaborations with other Australian universities include coral reconstructions of the mid-Holocene climate of the equatorial central Pacific (Associate Professor C. Woodroffe, Department of Geosciences, **University of Wollongong**) and measurement of stable isotope ratios in speleothems from China (Dr J-x. Zhao and Professor K. Collerson, Department of Earth Sciences, **University of Queensland**).

Professor D.H. Green continued his collaboration with the School of Earth Sciences, **University of Tasmania** (Drs A.J. Crawford, T.J. Falloon and L. Danyushevsky). He also continues as a member of the Tectonics Special Research Centre Advisory Council at the **University of Western Australia**.

Professor R.W. Griffiths began a new collaborative project with Dr J. Bye of the **University of Melbourne** on the dynamics of air-sea interaction.

Professor R. Grün collaborates with Professor A. Gleadow, Department of Geology, **University of Melbourne**, to study the thermal stability of paramagnetic centres from cores of the Otway basin, Dr P. White, Department of Anthropology, **University of Sydney** to date the site of Cuddie Springs, Dr C. Murray-Wallace, Department of Geosciences, **University of Wollongong** to date marine sequences in the Spencer Gulf, and Dr K. Moriarty and Dr R. Wells, **Flinders University**, to date faunal remains from Naracoorte Cave.

Dr G.O. Hughes is collaborating with Mr M. Barry and Professor G. Ivey of the Centre for Water Research, **University of Western Australia**, on aspects of mixing due to turbulence in stratified fluid.

Dr F.E.M. Lilley is collaborating with Dr A. White of **Flinders University** and Dr G. Heinson of **Adelaide University** in a number of marine electromagnetic studies, the most recent of which is OCELOT2000.

Professor M. McCulloch collaborates with Dr M. Kingsford from the Department of Biology, **University of Sydney**, on trace element analyses of fish otoliths, Dr C. Murray-Wallace, Department of Geosciences, **University of Wollongong**, to date marine sequences in the Spencer Gulf, and Dr K. Moriarty and Dr R. Wells, **Flinders University**, to date faunal remains from Naracoorte Cave. He is also collaborating with Dr T. Tentori from **Central Queensland University**, Rockhampton, on trace element analyses of sclerites from soft corals.

Professor I. McDougall and Dr W.J. Dunlap have collaborated closely with Ms S. McLaren, a PhD student in the Department of Geology and Geophysics, **University of Adelaide**, and with Dr M. Sandiford, on a thermochronological study of part of the northern Flinders Ranges, South Australia. Professor McDougall is working closely with Dr R. Watkins, **Curtin University of Technology**, on a project dealing with the mid-Cenozoic and younger history of the northern Kenya Rift, east of Lake Turkana. He also continued a collaboration with Dr G. Acton, formerly of the **University of New England**, on dating Cenozoic volcanic rocks in eastern Australia, to better define the polar wander path of Australia.

Dr C.E. Martin collaborates with Dr D. Al Bakri and Ms Alma Joglekar, Orange Agricultural College, **The University of Sydney**, on elemental and isotopic tracers of the sources of phosphorus in the Orange water supply catchment. (Dr Martin is acting as Associate Supervisor for Ms Joglekar's PhD research).

Dr C.E. Martin continued to collaborate with R. Syzmczak on studies of the noble metal geochemistry of riverine and estuarine waters that were collected in Papua New Guinea on cruises of the R/V *Franklin* as part of Project TROPICS (Tropical River-Ocean Processes in Continental Settings).

Dr J.M. Palin provided sulfur isotope data for Ms M. Kilby of the Australian National University Department of Geology as part of her honours project on the environmental geochemistry of sulfur around the Ranger uranium mine, Northern Territory.

Dr D. Phillips collaborated with Dr I. Cartwright and Ms C. Read of **Monash University** on the Arunta Block, Dr C. Fergusson from the **University of Wollongong** and Professor R. Offler of the **University of Newcastle** on the Lachlan Belt and with Mr A. Rae from the **University of Tasmania** on Philippine volcanics.

As leader of the regolith dating project with the CRC for Landscape Evolution & Mineral Exploration, Dr B. Pillans collaborated with Dr P. O'Sullivan and Dr B. Kohn, **University of Melbourne** and Professor R. Bourman, **University of South Australia**.

Dr D. Rubatto collaborated with Dr I.S. Buick from **La Trobe University**, Victoria, on the geochronology and geological evolution of the Reynolds Range (central Australia), as delineated by U-bearing minerals during prograde metamorphism and anatexis, and recently commenced a joint project with Professor D. Ellis and Dr L. Zhang (Department of Geology) to constrain the age of high pressure metamorphism in the Tianshan belt of NW China.

Dr N. Spooner collaborates with Professor A. Anderson, RSPAS, **the Australian National University**, on optical dating of megafaunal extinction event, Fiji, Professor J. Bowler, **University of Melbourne** on optical dating at Lake Mungo, Dr Philip Hughes, Consultant, on optical and carbon dating at Lake George: a reassessment of the regional palaeohydrology and palaeoclimate in the late Quaternary and Dr J. Magee, Department of Geology, The Faculties, **the Australian National University** on the paleohydrology of the Lake Eyre basin and megafaunal extinction.

Dr I.S. Williams continued his collaboration with Professor B.W. Chappell, **Macquarie University**, and Professor A.J.R. White, **Victorian Institute of Earth and Planetary Sciences**, in a study of the evolution of the Lachlan Fold Belt as recorded in zircon preserved in igneous and sedimentary rocks; with Dr P. Blevin, **ANU Geology Department**, in the study of magmatism associated with Palaeozoic mineralization in NSW; and with Dr I. Buick, **La Trobe University**, and Ms J. Miller, **Monash University**, in the study of metamorphism in central Australia and South Africa. Dr Williams also renewed his collaboration with Professor J. Hergt, **Melbourne University**, in the study of the Tasmanian Dolerites, with Dr W. Collins, **University of Newcastle**, in the study of the history of high-grade metamorphism in the southern Arunta, central Australia, and with Professor M.J. Rickard, **University of Newcastle**, in the study of inherited zircon in granite from Fiji.

## CONFERENCES AND OUTSIDE STUDIES

Ms N. Abram presented a paper and poster on the Holocene palaeoclimate of the Ryukyus Islands, Japan, at the 9th International Coral Reef Symposium held in Bali, Indonesia, from 23 to 27 October.

Dr R.A. Armstrong attended the annual meeting on the Kaapvaal Craton research group, held in Gaborone, Botswana, and convened by researchers from MIT, Carnegie and southern African institutions. He also attended Geocongress 2000, the biennial meeting of the Geological Society of South Africa, at which he co-authored some 14 research papers. In August he presented a Keynote address to the 31<sup>st</sup> International Geological Congress, held in Rio de Janeiro, Brazil.

Dr V. Bennett participated in the Plume 3 workshop, held at Kona, Hawaii in May. She presented a paper describing “Combined osmium isotopic and seismic evidence for orphaned early Proterozoic mantle beneath Phanerozoic crust in eastern Australia”, at the Roots of Archean Cratons symposium at the Geological Society of America Meeting, Reno, Nevada, in November.

Dr A.J. Berry attended the Goldschmidt 2000 Conference in Oxford from 3 to 8 September where he presented work on the oxidation state of chromium in silicate melts. He also visited the Department of Earth and Planetary Sciences, Hokkaido University and spent several days with Dr Kiyooki Niida observing volcanic features in southern Hokkaido, including the eruption of Mt Usu.

Dr. J. Braun gave a seminar entitled “On the nature of sediment transport mechanisms” at the University of Canberra in the CRC LEME seminar series. He also presented a poster at the AGU Fall meeting in San Francisco, and attended two workshops of the Canadian Institute for Advanced Research (in June in Calgary and in December in Montreal). During his stays in Canada, he gave seminars at the University of British Columbia (Vancouver), Queen’s University (Kingston, Ontario) and at Dalhousie University (Halifax, Nova Scotia).

Mr. D.R. Burbidge presented a poster titled “Numerical Models of the Evolution of Accretionary Wedges and Fold-and-Thrust Belts” at the 15<sup>th</sup> Australian Geological Convention, in Sydney, Australia (3 to 7 July). He attended the Canadian Institute of Advanced Research (CIAR) Earth System Evolution Program (ESEP) meeting in Calgary, Canada (3 to 4 June). He also presented seminars at the University of Washington in Seattle, USA (31 May to 2 June) and Dalhousie University in Halifax, Canada (7 to 10 June).

Professor J. Chappell was an invited speaker at the SCOR-IMAGES conference on millennial-scale climatic changes, held in Trins, Austria, February 15-20, where he presented a paper on “Rapid sea level changes in the last glacial cycle, from isotopic and coral reef evidence”. He also attended the 10<sup>th</sup> Australian and New Zealand Geomorphology Group Meeting held in Wanaka, New Zealand, from December 11-15, where he presented papers entitled “Rates of erosion and soil production across Australia determined from cosmogenic nuclides”, and “The global carbon cycle, soil production and the colour of water”.

Professor S.F. Cox presented an invited keynote lecture at the Geological Association of Canada/ Mineralogical Association of Canada annual meeting in Calgary in May. He also presented a paper at the Australian Geological Convention in Sydney in June, and was co-convenor of Theme 3 (Orogenic Belts as a Record of Past Processes on Planet Earth) at that conference. He presented an invited paper at the Symposium “Mountain and Metals”, convened by the Australian Crustal Research Centre at Monash University in December.

Dr G.F. Davies attended the Goldschmidt Geochemistry Conference at Oxford in September, and visited scientists involved in mantle mixing studies at Paris and Lyon in France and at Princeton and Berkeley in the USA.

Mr S.J. Fallon presented a paper entitled “*Porites* corals record higher trace element (Mn, Zn, Pb, Y, La, Ce) concentrations during increased sedimentation, Misima Island, Papua New Guinea” at the 9<sup>th</sup> International Coral Reef Symposium, Bali, Indonesia.

Mr C.M. Fanning presented a keynote paper entitled “More Shrimp for the Geologic Feast” at 31<sup>st</sup> International Geological Congress, in Brazil in August. He was involved with a number of presentations at the 15<sup>th</sup> Australian Geological Convention in Sydney in July and presented invited seminars on applications of the SHRIMP ion microprobe at the University of Chile, Santiago in March and August. He was invited to attend a field expedition to the southern Andes of Chile during March, and was an invited visiting scientist at the Antarctic Meteorite Research Center, National Institute for Polar Research, Tokyo, Japan in November. He also attended the “New Frontiers in Isotope Geoscience” conference in Lorne, Victoria in February and presented a paper at the Broken Hill Exploration Initiative, 2000 Meeting in Broken Hill in May.

Dr U. Faul organized a workshop on Electron Backscatter Diffraction at MicrOZcopy 2000 which was held in February in Canberra. He also presented a paper on applications of that technique to geologic materials. He attended the RIDGE sponsored MELT II meeting at Brown University, Rhode Island, and presented a paper entitled ‘Melt Segregation and Retention at Mid-Ocean Ridges’. He also attended the AGU Fall meeting in San Francisco and presented a paper entitled ‘Constraints on Porosity in Partially Molten Upper Mantle: Implications for Trace Element and U-Series Models’.

Dr J. Fitz Gerald was co-convenor of the conference “MicrOZcopy 2000” held in Canberra from 6 to 11 February, by the Australian Society of Electron Microscopy. He presented work describing boron nitride nanotubes in the poster session.

Dr M. Gagan was invited to attend the Ocean Drilling Program Shallow-Water Systems Submerged Coral Drilling Workshop held in St. Petersburg, Florida, from 2 to 4 October. He also presented a paper on aspects of high-resolution palaeoclimatology at the 9th International Coral Reef Symposium held in Bali, Indonesia, from 23 to 27 October.

Professor D.H. Green travelled to Italy to attend the International Symposium on Experimental Mineralogy Petrology and Geochemistry held in Bergamo, Italy, from 16-19 April and delivered the plenary lecture of the meeting ‘Primary Magmas and Mantle Temperatures’. He continued on to Manchester, England to the Geological Society of London ‘Geoscience 2000’ meeting where he was awarded the Murchison Medal and gave a lecture entitled “Primary Magmas and Mantle Potential Temperatures beneath ‘Ridges’ and ‘Hot-Spots’”. He also attended the Goldschmidt Conference in Oxford from 3-8 September where he delivered two lectures: ‘Primary Magmas, Mantle Temperatures and Buoyancy Plumes’ and ‘Phase Relations and Magmatism in the Mantle Wedge Above Subduction Zones’.

Professor R.W. Griffiths attended the Australian Meteorology and Oceanography Society Meeting held at Melbourne University, Melbourne, in February. He also attended the 5th International Symposium on Stratified Flows, 10 to 13 July, at the University of British Columbia, Canada, for which he co-convened a special one-day session in honour of the 70th birthday of Emeritus Professor J.S. Turner. Professor Griffiths was an invited Main Lecturer at the French-Italian Summer School on Geophysical and Astrophysical Fluid Dynamics, 18 to 30 June, which this year had as its theme “geomorphological fluid dynamics”. He also visited the University of Oregon to discuss a collaborative project with Professor K.V. Cashman and spent a week at the University of California at San Diego, where he presented research on wind-driven ocean circulation.

Professor R. Grün was invited to give a seminar at the 17th Meeting of the Swiss Tectonic Studies Group, 31 March to 1 April, Zürich, entitled “Reconstruction of cooling and denudation rates of the Eldzhurtinskiy Granite, Caucasus, using paramagnetic centres in quartz.” He was also invited for a special session at the 65<sup>th</sup> Annual Meeting of the Society of American Archaeology, 5 to 9 April, Philadelphia, PA, where he presented a talk on “Direct

Dating of Hominids Using ESR and U-Series Dating”. Early in 2000 he visited several universities in Europe and gave seminars at the Department of Geography, Universität Köln, and the Research Laboratory of Archaeology and the History of Art, University of Oxford. He also gave a talk on “ESR dating of faunal remains from Megafauna sites in Australia.” at the Workshop on Faunal Extinction on 9 June, at the Centre for Archaeological Research, the Australian National University, Canberra, and gave a seminar at the School of Biological Sciences, Flinders University.

Ms L. Hanley attended the Penrose 2000 Conference on Volcanic Rifted Margins, at the Royal Holloway College, The University of London at Surrey, UK in March. She also participated in the Penrose field excursion to the Deccan Traps, a large igneous province in India. She then attended the 15<sup>th</sup> Australian Geological Convention, “Understanding Planet Earth” held in Sydney in July, where she presented a paper and a poster on the Low-Ti Antrim Plateau Volcanics.

Ms E. Hendy presented a paper on “Multi-century comparison of coral climate proxy records” at the Fall AGU meeting held in San Francisco and was nominated for an outstanding student presentation. During January and February she took part in field work with Dr C. Hendy (University of Waikato) and Professor G. Denton (University of Maine) in Westland National Park, NZ, to obtain core samples from bogs and small lakes associated with the moraines of the last glacial maxima. In July she visited the Australian Institute of Marine Science, Townsville, to sample archived coral colonies, for collaborative research with Drs J. Lough and D. Barnes (AIMS).

Dr J. Hermann attended the Eighth International Symposium on Experimental Mineralogy, Petrology and Geochemistry, Bergamo, Italy, 16 to 19 April where he gave an oral presentation. He also attended the 15<sup>th</sup> Geological Convention, Sydney, 3 to 7 July where he made an oral presentation, and the 74<sup>th</sup> Convention of the Swiss Society of Mineralogy and Petrology, Winterthur, Switzerland, 14 to 15 October where he presented a poster and gave an invited seminar at the ETH-Zürich, Switzerland, on 14 April.

Dr A.P. Hitchman participated in the Fourteenth International Conference and Exhibition of the Australian Society of Exploration Geophysicists, held in Perth, WA, from 13 to 16 March, where he presented a paper on the total-field geomagnetic coast effect. Dr Hitchman also participated in the Fourth Australian Geomagnetic Workshop held in Canberra on 26 and 27 April. He presented a paper on his PhD research, and later compiled a report on the meeting for the ASEG publication ‘Preview’.

Dr M. Honda attended the “Beyond 2000: New Frontiers in Isotope Geoscience” conference held in Lorne, Victoria, early in the year, where presented a paper entitled “Systematic elemental fractionation of mantle-derived helium, neon and argon in MORB glasses”.

Dr G.O. Hughes attended the 7th Australian Meteorological and Oceanographic Society National Conference, held in Melbourne in February, and presented a talk entitled “Shear layers driven by turbulent plumes”. Dr Hughes was invited to visit the Centre for Water Research at the University of Western Australia in April, where he gave a seminar on “Internal gravity waves in a plume filling box”. He attended the 5th International Symposium on Stratified Flows, held in Vancouver in July, and presented a talk entitled “Localised mixing associated with a turbulent region in a stratified shear flow” as part of a special session to honour the research achievements of Emeritus Professor J.S. Turner. In July/August he also visited several fluid dynamics laboratories and collaborators at the University of California Berkeley, University of California San Diego, University of Alberta, University of Cambridge and University of Southampton.

Dr I. Jackson attended and presented papers at the Australian Institute of Physics condensed Matter Conference in Wagga Wagga in February, and the Fall Annual Meeting of the American Geophysical Union in December.

Professor B.L.N. Kennett in his role as President of IASPEI made a presentation to Working Group B of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty (CTBT) in Vienna in February urging the release of data from the International Monitoring System for scientific study. He then travelled to Japan to undertake a review of the Solid Earth Division of the National Institute for Earth Science and Disaster Research in Tsukuba. In May he attended the IRIS Workshop in Maine and followed this with visits to the seismology groups at the Massachusetts Institute of Technology and Princeton University and gave three seminars in each location. He then went to Washington and presented four papers at the Spring Meeting of the American Geophysical Union. In late September he went to Japan for five weeks on an invitational fellowship from the Japan Society for the Promotion of Science and worked at the Earthquake Research Institute, University of Tokyo with Dr T. Furumura on aspects of regional wave propagation in Japan including analysis of the October 6 earthquake in western Japan which occurred during his stay. At the beginning of November he was back in Vienna for two weeks, this time as a member of the review team for the International Data Centre for the CTBT.

Dr R.C. Kerr visited the Hawaiian Volcano Observatory in July. He presented a seminar on "Thermal erosion by laminar lava flows", and had discussions on lava flows and lava tubes with Dr J. Kauahikaua and Dr D. Swanson. He also attended the 5th International Symposium on Stratified Flows at the University of British Columbia, Vancouver in July, where he presented a paper on "The behaviour of turbulent fountains in a stratified fluid" in a special session to celebrate the 70<sup>th</sup> birthday of Emeritus Professor J.S. Turner.

Dr S. Kesson attended the Western Pacific AGU in Tokyo, Japan, 26 to 30 June and gave lectures at Ehime, Matsuyama and Kyoto Universities.

Professor K. Lambeck attended, as lead author, the Intergovernmental Panel on Climate Change meetings in February (Auckland, New Zealand) and July (Victoria, Canada). He also visited the European Community as member of a delegation to discuss Australian participation in the E.C. Framework program (Brussels in March), Amsterdam, as member of the Spinoza Commission (in May) and Baden as member of the Pangea International Resources Science Review Group (in June). In April he attended the European Geophysical Society meeting in Nice, gave the Scottish Universities Quaternary Lectures in St Andrews, attended the Israel Geological Society annual meeting, attended the BALTEEM workshop in Denmark, and the GEOSCIENCE 2000 meeting in Manchester. In September he participated in the Glaciology Summer School in Karthaus, Italy, and in October he attended the EPILOG workshop in Mt Hood, USA. In November he attended the Geological Society of New Zealand's annual meeting. In addition to giving papers and lectures at these various institutions he also visited the Universities of Louvain-la-Neuve, Copenhagen, Haifa, Cambridge, Groupe de Recherches de Geodesie Spatiale (Grasse) Utrecht, ETH (Zurich), Pacific Geoscience Centre (Victoria, Canada).

Dr F.E.M. Lilley co-convened the Fourth Australian Geomagnetic Workshop held in Canberra on 26 and 27 April, and presented recent results from research at RSES. He also attended the Palaeomagnetic Workshop, held in Canberra at AGSO on 3 and 4 May. He then participated in the meeting of the American Geophysical Union held in Washington D.C. from 29 May to 3 June, presenting four papers on work in geomagnetism at RSES. He attended the Australian Geological Convention held in Sydney in the first week of July, presenting a paper on regional electrical conductivity structure in the session 'Defining Australia: the Australian Plate as part of Planet Earth'. On 27 October he attended the Edgeworth David Symposium at the University of Sydney entitled 'Water and Salinity'. The utility of electromagnetic methods in studying salinity problems was highlighted at the meeting.

Professor M. McCulloch presented papers at the 10<sup>th</sup> annual Goldschmidt conference in Oxford and at the 9<sup>th</sup> International Coral Reef Symposium held in Bali. At the Workshop on Faunal Extinction, 9 June, Centre for Archaeological Research, Australian National University, Canberra, Professor McCulloch gave a talk entitled "U-series dating of Megafauna sites in Australia".

Professor I. McDougall attended the meeting “New Frontiers in Isotope Geoscience” held in Lorne, Victoria, early in the year, and presented a paper on high resolution geochronology. He also accepted an invitation from the Royal Swedish Academy of Sciences to participate in a symposium in Stockholm in May entitled “The Origin of Humankind and the Environment” where he presented a paper on the numerical time-scale for hominid evolution based on his work in the Turkana Basin, northern Kenya.

Ms H. McGregor attended three conferences in February including the 3<sup>rd</sup> annual AUSCORE (AUStralian COral REcords) meeting held at the RSES; the 4th Australian Graduate Climate Summer School, Port Lincoln; and the Quaternary Studies Meeting, hosted by the Department of Geology, The Australian National University. She was also awarded an Australian Coral Reef Society International Student Fellowship to present a paper on coral-based palaeoclimatology at the 9th International Coral Reef Symposium held in Bali, Indonesia, from 23 to 27 October.

Dr H. McQueen attended the 14<sup>th</sup> national Symposium on Earth Tides in Mizusawa, Japan, in August where he presented posters on “Absolute gravity measurements and calibration of SG-CT031 at Canberra” and “Instrumental drift and site stability at Canberra Gravity Station”.

Mr J. Marshall attended the 9<sup>th</sup> International Coral Reef Symposium at Bali from 23 to 27 October, and presented a paper on mid Holocene sea surface temperatures.

Dr C.E. Martin attended the Geological Society of America Annual Meeting in San Francisco, where she presented a talk on the Os isotope geochemistry of riverine and estuarine sediments from Papua New Guinea and the Gulf of Papua.

Dr J. Mavrogenes attended the 15<sup>th</sup> Australian Geological Convention, “Understanding Planet Earth” at Sydney in July, where he presented a paper on Broken Hill and co-authored four other papers.

Dr H. O’Neill attended the 10<sup>th</sup> Goldschmidt Conference in Oxford, UK, where he gave two poster presentations. During his visit to Germany from July to November he visited and gave talks at the Universities of Köln, Bochum, Göttingen, München, Frankfurt and Münster (twice), and also at the Bayerisches Geoinstitut, Bayreuth. He also gave a seminar at Bristol University, UK.

Mr D.I. Osmond attended the 7<sup>th</sup> Australian Meteorological and Oceanographic Society Meeting, Melbourne, and the 5<sup>th</sup> International Symposium on Stratified Flows, Vancouver, Canada, there presenting a paper on the formation of mode waters by wind-driven mixing at ocean fronts.

Dr J.M. Palin attended the Annual Meeting of the Geological Society of America in Reno during November where he gave a talk co-authored with Drs I.H. Campbell and C.A. Allen and Mr J. Ballard entitled “To see a world in a grain of sand – zirconology by excimer laser ablation ICP-MS”.

Dr D. Phillips attended the “Beyond 2000 Conference: New Frontiers in Isotope GeoScience” in Lorne in February and presented a paper entitled “Laser  $^{40}\text{Ar}/^{39}\text{Ar}$  step-heating analyses of single clinopyroxene inclusions extracted from Jwaneng, Orapa and Mbuji-Mayi diamonds”. He also attended the 15<sup>th</sup> Australian Geological Convention in Sydney, presenting a paper entitled “ $^{40}\text{Ar}/^{39}\text{Ar}$  and K-Ar whole rock age constraints on the timing of regional deformation, south coast of New South Wales, Lachlan Fold Belt, southeastern Australia: problems and implications”. In July he attended the “GeoCanada 2000” Conference in Calgary, Alberta and presented a paper entitled “Geochronology of kimberlites and related rocks: A synthesis of available techniques”.



Dr B. Pillans attended the 15<sup>th</sup> Australian Geological Convention at the University of Technology Sydney from 3 to 7 July, presenting a paper entitled "Paleomagnetic dating of Phanerozoic weathering imprints, Mount Percy mine, Kalgoorlie, Western Australia". He also attended the 10<sup>th</sup> Australian and New Zealand Geomorphology Group Meeting held in Wanaka, New Zealand, from 11 to 15 December, presenting a paper entitled "On the survival of Pre-Tertiary landforms and regolith in Australia: Continuous exposure or burial and exhumation?"

Dr D. Rubatto attended the following conferences: "Beyond 2000: New Frontiers in Isotope Geoscience" in Lorne, Australia, where she presented two papers on titanite dating and zircon trace element geochemistry. At Spring AGU in Washington DC, she presented two papers, and at the Annual Meeting of the Swiss Society for Mineralogy and Petrology she presented geochronological data from Alpine ophiolites.

Ms H. Scott-Gagan attended the 9<sup>th</sup> International Coral Reef Symposium held in Bali, Indonesia, from 23 to 27 October.

Dr N. Spooner attended the Quaternary Studies Meeting "Regional analysis of Australian Quaternary studies: strengths, gaps and future directions" February 7 to 9, held in Department of Geology, the Australian National University, and the Faunal Extinctions Workshop, Centre for Archaeological Research, 9 June, RSPAS, the Australian National University.

Dr W.R. Taylor attended the 15<sup>th</sup> Australian Geological Convention in Sydney in July where he presented a paper on the nature of the lithosphere sampled by the Skerring kimberlite pipe.

Dr P. Tregoning attended the 15<sup>th</sup> Australian Geological Convention in Sydney to give a paper entitled "Intraplate deformation of the Australian, Pacific and South Bismarck Plates from GPS observations". He presented a seminar regarding the 16 November earthquake in Papua New Guinea, at the Research School of Pacific and Asian Studies in December. He also attended the research seminars at the University of New South Wales in November where he presented two papers describing tectonic monitoring programs in Papua New Guinea and Antarctica.

Professor J.S. Turner attended the annual conference of the Australian Meteorological and Oceanographic Society, held in Melbourne in February. In June he visited the University of Cambridge for discussions with colleagues in the Institute of Theoretical Geophysics and the new BP Institute for Multiphase Flow. In July he attended the 5<sup>th</sup> International Symposium on Stratified Flows in Vancouver, Canada, and gave a paper on his recent experiments. During July and August he worked for three weeks with Professor P.F. Linden in the Department of Mechanical and Aerospace Engineering, University of California, San Diego, continuing joint research on the production of vortex rings, and their application to the understanding of aquatic propulsion mechanisms.

Mr N. Ware attended the 16<sup>th</sup> Australian Conference on Electron Microscopy held in Canberra in February. He was a member of the organising committee and ran a pre-conference workshop on "Energy Dispersive Spectroscopy".

Professor S. Webb attended the AGU Fall Meeting in San Francisco where she presented a paper on "Elastic wavespeeds from high-temperature ultrasonic interferometry in a gas-medium apparatus".

Mr M.G. Wells attended the AGU Ocean Sciences Meeting, San Antonio, Texas where he presented a paper entitled "Laboratory models of intermittent turbulence and salt fingers". He also gave a paper at the 7<sup>th</sup> Australian Meteorological and Oceanographic Society Meeting, Melbourne, entitled "Stratification produced by a destabilizing surface buoyancy flux in lakes of variable bathymetry". This paper won the prize for best student presentation.

Dr I.S. Williams attended the conference Beyond 2000: New Frontiers in Isotope Geoscience, held in Lorne in February, where he presented a paper on SHRIMP analysis of high-U zircon. For two weeks in March-April he was guest Visiting Scientist in the Antarctic Meteorite Research Centre, National Institute of Polar Research, Tokyo.

Dr S. Zhang presented a poster paper at the Australian Geological Convention in Sydney in June.

## **COOPERATION WITH GOVERNMENT AND INDUSTRY**

### **AUSTRALIAN ACADEMY OF SCIENCE**

Professor B.L.N. Kennett is a member of the National Committee on Solid Earth Sciences, and Chairman of the Subcommittee on Seismology and Physics of the Earth's Interior. He is Chair of the Academy Committees for Postdoctoral Opportunities in Japan and exchange arrangements with N.E. Asia (China, Japan, Korea, Taiwan).

Professor B.L.N. Kennett represents the Academy of Sciences on the National Committee for support of International Conferences in Australia.

Professor K. Lambeck was Vice President (until May) and is currently Foreign Secretary of the Australian Academy of Science and a member of its Council.

Dr F.E.M. Lilley is a member of the Geomagnetism and Aeronomy Subcommittee.

### **AUSTRALIAN GEOLOGICAL SURVEY ORGANIZATION (AGSO)**

Dr F.E.M. Lilley and Dr A.P. Hitchman continued collaboration with Dr P. Milligan of AGSO on the use of aeromagnetic crossover misfits as data of opportunity for studying electromagnetic induction in the Earth.

Dr F.E.M. Lilley worked with Dr C.E. Barton and Dr H. McCreadie of AGSO to organize the Fourth Australian Geomagnetic Workshop, held at the AGSO buildings in Canberra on 26 to 27 April. Some fifty participants attended from different parts of Australia and internationally. Recent results in geomagnetism were presented and discussed over the program of two days of sessions.

The Ion Microprobe subgroup continues to maintain a close working relationship with AGSO geochronologists, sharing expertise, standards, time, costs and maintenance responsibilities for the SHRIMP I and II ion microprobes. This year the two groups combined in the sampling and characterisation of a new zircon standard for SHRIMP analysis, to be known as Temora.

### **AUSTRALIAN NATIONAL SEISMIC IMAGING RESOURCE (ANSIR)**

Professor D.H. Green is a member of the Board of Management of the Australian National Seismic Imaging Resource (ANSIR).

Professor B.L.N. Kennett is Deputy Director of the Australian National Seismic Imaging Resource (ANSIR), a Major National Research Facility operated as a joint venture by the Australian Geological Survey Organisation and the Australian National University .

The portable instrument facility of ANSIR is housed at RSES and equipment is available via a competitive proposal scheme. In 2000 instrumentation has been provided to:

- Monash University for broadband studies in Victoria.
- A consortium of CSIRO Exploration and Mining and BHP Coal for studies of seismicity in the Appin Coal Field, NSW.
- RSES for the Western Australian Craton experiment.
- The Institute of Geological and Nuclear Sciences, New Zealand in association with RSES for work in the Transantarctic mountains.

**AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION (ANSTO)**

Dr A.J. Berry collaborated with Dr M. James on neutron diffraction studies of humite minerals.

**AUSTRALIAN INSTITUTE OF MARINE SCIENCE (AIMS)**

Mr S.J. Fallon is working with Dr J. Lough and Dr D. Barnes (AIMS) and J. White from Misima Mines Ltd. documenting environmental influences on *Porites* corals from a high sedimentation environment, Misima Island, PNG.

Ms E Hendy, Professor M. McCulloch and Dr M. Gagan continued collaborative work with Drs J. Lough, D. Barnes and P. Isdale. Ms Hendy's PhD research is a central project of the AUSCORE (AUStralian CORal REcords) initiative to demonstrate that corals accurately record common climate signals and can document decadal to centennial climate variability in the Great Barrier Reef over the last 400 years.

Ms H. McGregor and Dr M. Gagan continued collaborative research with Drs G. Brunskill, J. Lough and D. Barnes. Ms. McGregor's PhD research is part of Project TROPICS (Tropical River-Ocean Processes in Coastal Settings) and aims to use corals to reconstruct the mid-Holocene climate of the Western Pacific Warm Pool north of Papua New Guinea.

Dr C.E. Martin continued to collaborate with Dr G. Brunskill on studies of the geochemistry of platinum-group elements and Os isotopic systematics in riverine and estuarine sediments from Papua New Guinea.

**AUSTRALIAN SCIENTIFIC INSTRUMENTS PTY LTD (ASI)**

Professor R.W. Griffiths continued a collaboration with ASI on the construction and marketing of the Geophysical Flows Rotating Table. Three units were shipped to customers at the University of California at San Diego, USA, the University of Rhode Island, USA, and the University of Alberta, Canada.

Dr I.S. Williams continued his longstanding collaboration with Australian Scientific Instruments (now a proprietary limited subsidiary of ANUTECH Pty Ltd) in the manufacture and marketing of SHRIMP ion microprobes. Over a two-week period in March-April he visited the National Institute of Polar Research, Tokyo, with Mr J. Hyder, ASI, to set up procedures for stable isotope analysis using the new NIPR SHRIMP II.

**COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION (CSIRO)**

Dr R.C. Kerr continued a collaboration with Dr S.J. Barnes of Division and Exploration and Mining, Perth, in modelling komatiite lava emplacement and thermal erosion at Perserverance, Western Australia.

Dr C.E. Martin and Professor M. McCulloch continued their collaboration with Drs C. Wilson, P. Wallbrink, and J. Olley (Land and Water) on tracing the sources and transport of sediment and associated phosphorus in Australian rivers. Dr Martin is also collaborating with Dr R. Oliver (Murray-Darling Freshwater Research Centre) on an investigation of the uptake of trace elements by the blue-green “algae” (cyanobacteria) *Anabena*.

Dr H. O’Neill and Mr W.O. Hibberson continued to collaborate with Dr I.E. Grey of the Division of Minerals on a study of novel crystalline phases synthesised at very high pressures in the system CaO-Al<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub>. Dr O’Neill also continued his collaboration with Dr M.I. Pownceby of the Division of Minerals on the experimental calibration of solid-state redox sensors, and on Fe<sup>2+</sup>/Mg partitioning between co-existing minerals.

Dr N. Spooner collaborates with Dr J. Olley of Division of Land and Water, on optical dating on the Murrumbidgee floodplains, which involves a comparison between single and multiple-grain dating.

### **COOPERATIVE RESEARCH CENTRE FOR LANDSCAPE EVOLUTION AND MINERAL EXPLORATION (CRC LEME)**

Dr Pillans is leader of the dating project in CRC LEME and is primarily responsible for dating regolith materials by paleomagnetic techniques.

### **OTHER GOVERNMENT AND INDUSTRY**

Drs I.H. Campbell and J.M. Palin, in collaboration with **Placer Granny Smith Pty Ltd** have obtained a SPIRT grant for “Mapping ore-fluid pathways around mesothermal gold deposits in the Laverton region, WA using alkali elements and stable isotopes. Ms A. Stoltze began a PhD on the project late in the year.

Professor J. Chappell continued his collaboration on Cenozoic fossil sites with Dr K Aplin of the **Western Australian Museum**, with field trips together to new sites in the Kimberley and Barrow Island.

Professor S.F. Cox is conducting collaborative research on structural and deformational controls on fluid flow and ore genesis in Archaean lode gold deposits in the Kambalda area sponsored by **WMC Resources Ltd** (St Ives Gold Operations) and the **ARC-APA(Industry)** scheme. He is also collaborating with Dr B. Drummond (AGSO) on aspects of crustal-scale fluid flow through fault systems in the Eastern Goldfields of Western Australia. In December, Professor S.F. Cox participated in a joint **AGSO-NSW Department of Minerals and Energy** workshop on seismic hazard in the Newcastle region.

Mr C.M. Fanning continued collaborations with the **Geological Surveys of South Australia, Victoria, New South Wales, and Queensland**. He also collaborates with a number of mineral and petroleum exploration companies.

Dr M. Gagan is collaborating with Dr G. Woerhide, Centre for Biodiversity, **Queensland Museum**, to study the stable-isotope systematics of Great Barrier Reef sponges.

Professor D.H. Green continued to serve as Chairman of the Greenhouse Science Advisory Committee in the **Department of the Environment and Heritage**.

Mr C. Heath has commenced a PhD study of the “Origin and composition of ore-forming fluids in the giant Golden Mile gold deposit, Kalgoorlie” in collaboration with **Kalgoorlie Consolidated Gold Mines**. The project is being supported by a grant to Drs Campbell and Palin through the SPIRT program.

Professor B.L.N. Kennett has continued to provide support to the **Comprehensive Nuclear-Test-Ban Treaty (CTBT) Organisation in Vienna**. With J. Grant in Tennant Creek he has been involved in the process of the upgrade of the Warramunga Array to meet the requirements of the treaty for both seismic and infrasonic recording. The infrasound upgrade was completed in October. Certification of both arrays will occur soon following the completion of authentication procedures for the data being transmitted by satellite to Vienna. He was also a member of the review team for the International Data Centre for the CTBT carried out over a two-week period at the beginning of November.

Professor K. Lambeck is Chair of the **Antarctic Science Advisory Committee**, a member of the **AUSLIG** Geodesy Reference Group and a member of an **AUSAID** Technical Advisory Group. He is also a member of the **Pangea Resources International Science Review Board**.

Dr D. Phillips has participated in collaborative studies with the **Australian Geological Survey Organisation** as well as the **Geological Surveys of South Australia, the Northern Territories and Western Australia**. He also collaborated with a number of Australian exploration and mining companies.

Dr B. Pillans continued his collaboration with Dr A. Bateman (**Kalgoorlie Consolidated Gold Mines**) in paleomagnetic dating of regolith at Mt Percy mine, Kalgoorlie

Mr B. Rohrlach and Drs I.H. Campbell, R.R. Loucks, J.M. Palin and Professor I. McDougall have continued their collaboration with **WMC Resources Ltd** in the study of the Tampakan Cu-au deposit ore district in southern Mindanao, Philippines.

Dr P. Tregoning is collaborating with Dr R. Govind of the **Australian Surveying and Land Information Group** to analyse the co-seismic movement of the GPS site at the Cocos Islands after the June 18 earthquake.

## EDITORIAL RESPONSIBILITIES

Dr C. Allen was a special editor for the *Australian Journal of Earth Sciences* for a volume to be titled "25 Years of I & S Type Granites".

Dr M. Bird served on the editorial board of *Geology*.

Professor J. Chappell served on the editorial board of *Quaternary Research*.

Professor S.F. Cox continued as a member of the editorial advisory boards of *Journal of Structural Geology*, and *Geofluids*.

Mr C.M. Fanning is an associate editor of the *Bulletin of the Geological Society of America*.

Professor R. Grün is editor of *Quaternary Geochronology (Quaternary Science Reviews)*, member of the editorial boards of *Quaternary International*, and *Radiation Measurements*, and Member of reviewers' panel of *Ancient TL*.

Drs I. Jackson and J. Fitz Gerald continued on the editorial advisory board of *Physics and Chemistry of Minerals*.

Professor B.L.N. Kennett is an associate editor for *Physics of the Earth and Planetary Interiors*.

Dr F.E.M. Lilley is a member of the editorial board of the *Brazilian Journal of Geophysics*.

Professor M McCulloch is a member of the editorial board of *Quaternary Geochronology* (*Quaternary Science Reviews*) and a council member of the *International Association of Geochemistry and Cosmochemistry*.

Dr C.E. Martin is an associate editor for *American Journal of Science*.

Dr J. Mavrogenes is an associate editor of *Economic Geology*.

Dr H. O'Neill is on the editorial board of *Chemical Geology*.

Dr B. Pillans is a member of the editorial boards of *Quaternary Science Reviews* and *Catena*.

Dr M. Sambridge continued to serve on the editorial board of *Geophysical Journal International*. He handles papers through the Pacific Region Office.

## **HONOURS AND AWARDS**

### **ACADEMIC STAFF**

Professor D.H. Green was awarded the Year 2000 Murchison Medal of The Geological Society of London.

Dr J. Hermann was awarded the Paul Niggli medal of the Swiss Academy of Science for the most outstanding young earth scientist for 2000.

Professor K Lambeck was the Scottish Universities Quaternary Lecturer for 2000. He has also received the 2001 Tage Erlander Guest Professorship from the Swedish Research Council.

Dr H. O'Neill was awarded a Forschungspreis (Research Prize) by the Alexander-von-Humboldt-Stiftung of Germany, which enabled him to spend five months at the Universities of Bochum and Cologne.

### **STUDENTS**

Ms N. Abram, a PhD student in the Environmental Processes Group, was awarded the University Medal for her undergraduate academic achievements in the Department of Geosciences, The University of Sydney.

Mr T. Barrows, a PhD student in the Environmental Processes Group, was awarded the RSES Robert Hill Memorial Prize in recognition of his interdisciplinary research and effective communication in the earth sciences.

Ms H. McGregor, a PhD student in the Environmental Processes Group, was awarded an Australian Coral Reef Society International Student Fellowship to participate in the 9th International Coral Reef Symposium held in Indonesia. Along with Mr C. Magee, she was also the recipient of the K.S.W. Campbell Award for Teaching Excellence in the Department of Geology, The Australian National University.

Mr M.G. Wells, a PhD student in the Geophysical Fluid Dynamics Group, for the second time, won the award for the best student presentation at the annual Australian Meteorology and Oceanography Society Meeting held in Melbourne in February.

## HONOURS SUPERVISION

Professor S.F. Cox supervised the Honours project of Mr C. Nicholson (“Structural controls on fluid flow and gold mineralisation, North Orchin deposit, St Ives Goldfield, WA”) in the Geology Department, The Faculties.

Dr J. Hermann supervised the honours research project of Ms S. Williams, the Australian National University Geology Department, on the Himalayan eclogites from SW-China.

Professor B.L.N. Kennett and Dr M. Sambridge supervised Ms Catherine Farmer, an Honours student from the Department of Geology (ANU), on a project entitled ‘Studies of seismic source characterisation with the Neighbourhood Algorithm’.

Dr J. Mavrogenes supervised the Honours Research projects of Ms M. Sloane on Broken Hill and Mr A. Johnston on molybdenite geochemistry.

## INTERNATIONAL COLLABORATION

Dr R. Armstrong has been involved in a number of joint international research projects with scientists from several African countries, the United Kingdom, Germany, Portugal, Austria, Brazil and South Korea. These include Professor L. Robb, Professor U. Reimold, Dr R. Gibson, Dr M. Poujol (**University of the Witwatersrand, RSA**); Professor S. McCourt (**University of Durban-Westville, RSA**), Professor A. Wilson (**University of Natal, RSA**); Professor M. de Wit, Mr W. Board (**University of Cape Town, RSA**); Professor S. de Waal (**University of Pretoria, RSA**); Professor A.B. Kampunzu and Dr R. Mapeo (**University of Botswana**), Mr B.K. Paya (**Geological Survey of Botswana**); Mr. K. Hoffmann (**Geological Survey of Namibia**); D. Jamal (**Eduardo Mondlane University, Mozambique**); Professor C. Koeberl (**University of Vienna**), Dr J. Konzett (**University of Innsbruck, Austria**), S. Helferich (**J.W. Goethe-University, Frankfurt, Germany**), Dr. S. Siegesmund (**Institut für Geologie und Dynamik der Lithosphäre, Germany**), Dr R. Key (**British Geological Survey**); Dr Deung-Lyong Cho (**Korea institute of Geology, Mining and Materials**) and Dr M. Pimentel (**University of Brazilia, Brazil**).

Dr. R. Armstrong has also had extensive and fruitful collaboration with a number of scientists from the Geological Surveys of Britain, Botswana, South Korea, Namibia and Zambia. He has also consulted for, and collaborated with, scientists from the South African Council for Geosciences in projects in the southern African region and in Morocco. A number of geochronological projects for Australian and international exploration companies were completed during the year.

Mr J. Ballard, Drs I.H. Campbell and J.M. Palin, are collaborating with **CODELCO** on a study of igneous and hydrothermal activity in and around the giant Chuquicamata porphyry copper deposit in northern Chile.

Dr V. Bennett continues collaborations with Professor M. Garcia, **University of Hawaii** on the source characteristics of Hawaiian plume basalts, and with Dr A. Kent of the **Danish Lithosphere Center** on the origins of Baffin Island basalts.

Dr A.J. Berry visited the School of Chemistry, **University of Exeter**, United Kingdom as part of his collaboration with Drs S.C. Wimperis and S.E. Ashbrook on nuclear magnetic resonance studies of high-pressure hydrous magnesium silicates.

Dr M. Bird continued collaboration with Dr H. Santruckova of the **University of Southern Bohemia**, Czech Republic, on studies of the fractionation of carbon-isotopes by micro-organisms during soil carbon degradation. He is also working with Professor J. Lloyd, **Max**

**Planck Institute for Biogeochemistry** on a study of soil carbon in the Siberian boreal forests and Botswana. He also continued to collaborate with Dr E. Veenendaal, **Okavango Research Centre**, Botswana on a study of carbon inventories in Botswanan soils, and he collaborated with Dr C.S.M. Turney, Royal Holloway, **University of London** and Dr L. Ayliffe, **CNRS-CEA**, Gif Sur Yvette, France on the radiocarbon dating of Australian Archaeological sites. Together with Dr P. Bowman of the **McGregor Museum**, South Africa, he is participating in a radiocarbon dating study of the Border Cave Archaeological site.

Dr J. Braun is working on a project studying the diffusion of argon in K-feldspars with Dr. J. Lee of **Queen's University**, Canada. He continues collaborative work on the dynamics of compressional orogens and the interactions between tectonics and erosion with the Geodynamics Group of Professor C. Beaumont at **Dalhousie University**, Canada. He is collaborating with Miss S. Frederiksen of the **University of Aarhus**, Denmark on incorporating strain localization in models of continental extension, and with Mr Y. van Brabant of the **University of Liège**, Belgium on the tectonic development of the Variscan fold-and-thrust belt in the Rheno-hercynian zone in Belgium and Germany.

Drs I.H. Campbell and J. Mavrogenes and Mr B. Setiabudi are working with **Rio Tinto Indonesia** on a study of the Kelian Gold Mine in Kalimantan.

Mr C.M. Fanning is collaborating with Dr K.R. Ludwig and Dr R. Mundil of the **Berkeley Geochronology Center**, San Francisco, USA, Dr J.A. Aleinikoff and Mr W.V. Premo of the **US Geological Survey**, Denver USA, Dr K. Shiraishi and Dr Y. Motoyoshi of the **National Institute for Polar Research**, Tokyo, Japan, Dr J. Goodge, **Southern Methodist University**, USA, Dr J.J. Peucat of **Geosciences, Rennes**, France, Professor R.P. Menot, **Université Jean Monnet, St Etienne**, France, Professor P. K. Link of **Idaho State University**, Dr T.S. Laudon of **University of Wisconsin**, Dr J. Jacobs of **University of Bremen**, Germany, Professor F. Hervé of **University of Chile**, Santiago, Chile, Professor D. Gebauer and Dr A. Liati, **ETH Zürich**, Switzerland, Dr R.J. Pankhurst and Dr I. Millar of the **British Antarctic Survey**, UK, Dr C.W. Rapela, **Universidad de la Plata**, Argentina and Dr A. Morton, **British Geological Survey**.

Dr J. Fitz Gerald collaborated with Professor T.M. Harrison, **University of California, Los Angeles** on characterisation of exsolution in a cryptoperthite that is being studied for Ar-release systematics.

Dr M. Gagan continued cooperative research with Dr W. Hantoro, **Indonesian Institute of Sciences**, to extract late Quaternary climatic histories from raised coral terraces in Indonesia. Collaborative work continues with Professor K. Sieh, **California Institute of Technology** and Professor L. Edwards, **University of Minnesota**, which aims to integrate palaeoclimatic and palaeoseismological records derived from Indonesian corals. Work continued with Drs T. Correge, G. Cabioch, and J. Recy, **ORSTOM** and Drs W. Beck and G. Burr, **University of Arizona** to reconstruct tropical palaeoclimates of the southwestern Pacific during the Younger Dryas event. Collaborative research on coral-based palaeoclimatology continued with Dr L. Ayliffe, **University of Utah**, USA. He is also working with Professor G. Miller, **University of Colorado**, to reconstruct Australian palaeoclimates using isotopic signatures in emu and *Genyornis* eggshell. New collaborative work to investigate the geochemistry of foraminifera in deep-sea cores is under way with Professor H. Spero, **University of California at Davis**, and Professor D. Lea, **University of California at Santa Barbara**.

Professor D.H. Green continued his collaboration with Dr K. Niida, **University of Hokkaido** and Professor H. Davies, **University of Papua New Guinea** on the study of ultramafic rocks. Professor Green continues to be a member of the **Cambridge Commonwealth Trust**.

Professor R.W. Griffiths and Dr R.C. Kerr began the first trial laboratory experiments as part of a collaboration with Professor K.V. Cashman, **Oregon State University**, USA, on the dynamics and emplacement of long basaltic lava flows, partially funded by an NSF research grant to Professor Cashman. Professor Griffiths is also collaborating with Dr J.A. Whitehead



of the **Woods Hole Oceanographic Institution**, USA, on theoretical problems in morphological instabilities driven by cooling and rheology change.

Professor R. Grün has developed a virtually non-destructive ESR dating protocol which allows the measurement of enamel fragments without the necessity of destructive grinding. He has collected hominid samples from the anthropological sites Cave of Hearths, Hutjiespunt and Swartkrans, South Africa (Professor V.A. Tobias, Dr L. Berger, Department of Anatomy, Medical School, **University of the Witwatersrand**, Professor J. Parkington, Department of Archaeology, **Cape Town University**, Dr F. Thakeray, **Transvaal Museum**, Pretoria), Skhul, Israel (Dr J. Pilbeam, **Peabody Museum**, Harvard University and Professor O. Bar-Yosef, Department of Anthropology, **Harvard University**), Tabun (Professor C.B. Stringer, **Natural History Museum**, London) and Atapuerca, Spain (Dr J.L. Arsuaga, Department of Palaeontology, **Universidad Complutense**, Madrid and Dr J. Bermudes de Castro, **Museo de Ciencias Naturales**, Madrid). He continues his collaboration with Professor Bershov, Dr A. Gurbanov, **Institute of the Geology of Ore Deposits**, Moscow and Dr D. Koshchug, **Moscow State University**. Samples from the Eldzhurtinskiy granite complex have been employed to establish which surface sampling techniques can be used for ESR studies of cooling and denudation rates. Samples were also collected from the Elbrus for the reconstruction of the eruption history of Europe's highest volcano.

Professor R. Grün, Professor M McCulloch and Dr N. Spooner are collaborators in Professor Miller's (Department of Geological Sciences, **University of Colorado at Boulder**) successful NSF application "*Megafauna Extinction, Ecosystem Disruption, and Climate Change in Australia: Assessing the Human Factor*".

Dr J. Hermann collaborated with Dr O. Müntener, **Geologisches Institut, ETH-Zürich**, Switzerland, on the differentiation of mafic magma at the continental crust-mantle boundary and the exhumation of lower crust and upper mantle during rifting; with Professor R. Compagnoni, **University of Torino**, Italy, on the features of ultra-high pressure metamorphism in the Dora-Maira Massif; with Professor V. Shatsky and Professor A. Korsakov, **Geophysics and Mineralogy, Novosibirsk**, Russia, on age and exhumation rate of diamondiferous rocks from the Kokchetav Massif, Khazakhstan; with Dr M. Scambelluri, **University of Genova**, Italy, on subduction related structures in the Erro-Tobbio unit, Western Alps and on constraints on subduction zone fluids derived from the high pressure break down of serpentinites; with Dr B. Cesare, **University of Padova**, Italy, on magmatic and metamorphic evolution of mafic cumulates of the Tauern window, Alps and with Dr Igor Villa, **University of Bern**, Switzerland, on dating of multiply-zoned amphiboles.

Dr G.O. Hughes continued a collaboration with Dr S.B. Dalziel, Department of Applied Mathematics and Theoretical Physics, **University of Cambridge**, Dr P.F. Linden, Department of Mechanical and Aerospace Engineering, **University of California San Diego**, and Dr B.R. Sutherland, Department of Mathematical Sciences, **University of Alberta**. They are studying the evolution of internal gravity waves in a stratified fluid and mixing due to stratified turbulence.

Professor B.L.N. Kennett is President of the **International Association for Seismology and the Physics of the Earth's Interior (IASPEI)** and in that position is a member of the Executive Committee of the **International Union of Geodesy and Geophysics (IUGG)**.

Professor B.L.N. Kennett has established collaborative links with the **Earthquake Research Institute, University of Tokyo** for the Ocean Hemisphere Project (Professor Y. Fukao) and the study of strong ground motion (Dr K. Koketsu, Dr T. Furamura).

Dr R.C. Kerr continued a collaboration with Dr C.M. Leshner, Mineral Exploration Research Centre, **Laurentian University**, and Dr D.A. Williams, Department of Geology, **Arizona State University**, in developing and applying numerical models of the submarine flow of komatiite lavas.

Professor K. Lambeck is a member of the EPILOG steering committee (climate and environment during the Last Glacial Maximum), of the BALTEEM working group (Palaeoenvironment and Palaeoclimate of the Baltic during the Last Interglacial), an associate member of the Canadian Institute for Advanced Research, and a member of the Stage 3 Working Group concerned with climate and environment of Europe during oxygen isotope stage 3. In addition, he has cooperative research projects with scientists in Italy, France, Netherlands, Sweden, United Kingdom, Switzerland and the United States.

Dr F.E.M. Lilley is collaborating with Professor J.T. Weaver of the **University of Victoria, Canada**, on methods for the analysis of magnetotelluric data. Dr Lilley is collaborating with Associate Professor I.J. Ferguson of the **University of Manitoba, Canada**, on the interpretation of magnetotelluric data from western Queensland. Dr Lilley is collaborating with Dr M.R. Ingham of **Victoria University of Wellington, New Zealand**, on E-Map methods of magnetotelluric investigation.

Professor M. McCulloch has continued his collaboration with Dr A. Tudhope from the **University of Edinburgh** on U-series dating fossil corals from the uplifted coral terraces at Huon Peninsula Papua New Guinea. Collaboration continues with Professor U. Radtke from **Köln University**, Germany. He is also working with Dr Ingram, **University of California at Berkeley**, in a National Geographic sponsored project on coral bleaching in the southern Pacific.

Professor I. McDougall accepted an invitation to participate in a collaborative research project with Dr B. Robineau and Dr P. Bachélery, **Université de La Réunion**, on further studies of the history of the volcanoes of La Réunion, Indian Ocean. A two-week visit was made in July, fortuitously coinciding with the declining stages of a volcanic eruption from the active volcano, Piton de la Fournaise. He was privileged to undertake extensive field work during the visit; this included the opportunity to appreciate some of the considerable advances in understanding of the geology of La Réunion since he worked there more than 30 years ago. He also maintains an active collaboration with Professor F.H. Brown of the **University of Utah** that deals with numerical time scale studies of stratigraphic sequences in Kenya and Ethiopia in relation to hominid evolution. This work is also linked with that of Dr M.G. Leakey of the **National Museums of Kenya**. A collaborative project with Dr D. Karner, Dr P. Renne and T. Becker of the **University of California, Berkeley** and the **Berkeley Geochronology Center** on the usefulness of the high potassium mineral, leucite, as a potential standard for dating Quaternary rocks by the  $^{40}\text{Ar}$ - $^{39}\text{Ar}$  method, was successfully completed during the year, as was a project collaboration with Professor W.J. Verwoerd and Dr L. Chevallier, **University of Stellenbosch**, on K-Ar dating of Marion Island, a Quaternary shield volcano in the Southern Ocean.

Dr H. McQueen and Professor K. Lambeck collaborated with Professor T. Sato of the **National Astronomical Observatory of Japan** in operating and analysing a Superconducting Gravimeter at Mt Stromlo to monitor dynamic processes in the Earth. The former also collaborated with Dr M. Amalvict of the **Université Louis Pasteur** in Strasbourg on FG5 Absolute gravimeter calibrations at Mt Stromlo.

Dr C.E. Martin continued her collaboration with Drs B. Peucker-Ehrenbrink and G. Ravizza, **Woods Hole Oceanographic Institution**, USA, in studies of the Os isotope and platinum-group element geochemistry of sediments and natural waters. Dr Martin is a member of the international project **TROPICS** working group, which is studying the physical and chemical oceanography and sedimentology of the coastal margins of Papua New Guinea.

Dr C. Mériaux continued a collaboration with Dr J.R. Lister, Institute of Theoretical Geophysics, **University of Cambridge**, on the propagation of dykes in the Earth's crust.

Dr H. O'Neill is collaborating with Dr S. Redfern, **University of Cambridge**, on neutron-diffraction studies of order-disorder phenomena in spinels and other minerals. He is working with Professor H. Palme, **Universität zu Köln**, on trace element partitioning in chondritic

meteorites, and with Professor S. Chakraborty, **Ruhr-Universität Bochum**, on a laser ablation ICP-MS study of trace-element partitioning in metamorphic rocks.

Dr D. Phillips participated in collaborative research projects with Dr J. Vry of **Victoria University of Wellington**, Professor J.S. Marsh of **Rhodes University, South Africa**, Dr C. DeLor of **BRGM, France**, Dr I. Basson of **Mineral Services, South Africa** and Dr J. Goodge of the **Southern Methodist University, Dallas**.

Dr B. Pillans continued his collaboration with Drs B. Alloway, A. Beu, and T. Naish, **Institute of Geological & Nuclear Sciences**, on Plio-Pleistocene stratigraphy of Wanganui Basin, New Zealand. He also collaborated with Dr G.W. Berger, **Desert Research Institute, Reno**, and Drs P. Tonkin and P. Almond, **Lincoln University**, on luminescence dating of New Zealand loess.

Dr D. Rubatto continued her collaboration with Professor V. Tromsdorff from the **Institute for Mineralogy and Petrology, ETH, Zürich**, on the geochronology of peridotite bodies from the Alps and South Spain. Her project on the geochronology of the Argentera Massif (Western Alps) in collaboration with Dr B. Lombardo, Dr F. Colombo and Professor R. Compagnoni from **Torino University** has been completed, whilst the collaboration with Dr B. Cesare from the University of Padova continues with the acquisition of new geochemical data on the mafic rocks from the Tauri Window (Eastern Alps). She also works with Dr D. Castelli from **Torino University, Italy**, on the petrology and geochemistry of metamorphic titanite.

Dr N. Spooner collaborates with Professor A. Franklin, **University of Maryland** on the kinetics of red quartz luminescence and numerical modelling and with Professor G. Miller, **University of Colorado at Boulder** on optical dating of the *Genyornis newtoni* extinction event. He is Associate Investigator of a successful NERC (UK) grant with Dr Turney, **University of London** on “*The human colonisation of Australia: Breaking the 40 ka BP radiocarbon barrier*”.

Dr P. Tregoning has continued his cooperation with Drs R. King, T. Herring and S. McClusky of the department of Earth, Atmospheric and Planetary Sciences, **Massachusetts Institute of Technology** in the development and testing of the GAMIT GPS software. He also continued to collaborate with Mr R. Curley, Department of Surveying and Land Studies, **The Papua New Guinea University of Technology**, and Mr S. Saunders, **Rabaul Volcano Observatory**, in the ongoing measuring of tectonic motion in Papua New Guinea.

Professor J.S. Turner continued his collaborations with Professor G. Veronis, **Yale University**. Their study of double-diffusive intrusions has been extended to explore further the differences between isolated sources of salt or sugar sources flowing into homogeneous solutions of the other. Work on the production of vortex rings, with Professor P.F. Linden, **University of California, San Diego**, has led to insight into the swimming mechanisms of fish and other marine organisms, and application of these concepts to the design of propulsion devices.

Dr I.S. Williams continued his collaboration with Professor H. Zeck, **Copenhagen University**, in the use of zircon inheritance in Miocene igneous rocks from southern Spain to study the processes of magma genesis, and with Dr J. Goodge, **Southern Methodist University, Dallas**, on the provenance of late Proterozoic and early Palaeozoic sediments of the Beardmore Group and elsewhere in the Transantarctic Mountains. He spent two weeks in Tokyo working with Dr K. Shiraishi and Dr K. Misawa, **National Institute of Polar Research**, on SHRIMP analysis of the oxygen isotopic composition of meteorites, and also undertook small collaborative studies in zircon geochronology with Dr U. Pöller, **Max Plank Institute, Mainz**, Dr K. Burke, **University of Houston** and Dr J. Kraus, **Mobil Exploration Ventures, Dallas**.

## OTHER MATTERS

Dr A.J. Berry in collaboration with Dr H.StC. O'Neill received three grants from the Australian Synchrotron Research Program to visit the Australian National Beamline Facility in Tsukuba, Japan, to study the oxidation state of transition metal ions in silicate melts at temperatures up to 1500°C.

Dr A.J. Berry and Dr J.A. Mavrogenes investigated the speciation of ore-metal ions in synthetic fluid inclusions as a function of temperature at the Advanced Photon Source, Argonne National Laboratory, USA, under a grant from the Access to Major Research Facilities Fund.

Dr. J. Braun is an associate member of the Cooperative Research Centre for Landscape Evolution and Mineral Exploration (CRCLEME).

Dr I.H. Campbell is a member of the Commission for Igneous and Metamorphic Petrogenesis, a subcommission of the International Union of Geological Sciences. He is also a councillor of the International Mineralogical Association.

Professor S.F. Cox continued as the Australian representative of the International Association of Tectonic and Structural Geologists.

The Geophysical Fluid Dynamics group enjoyed being host to a work experience student from Melrose High School for one week in November.

Professor R.W. Griffiths served as a member of the International Advisory Committee for the Institute of Earth Sciences, Academia Sinica, Taiwan, and visited the Institute for ten days in November.

Professor R. Grün received an RIEF grant to purchase a new automated, high-sensitivity ESR spectrometer. Dr R. Wells, Flinders University, and Dr Murray-Wallace, University of Wollongong, were the co-applicants.

Professors R. Grün and M. McCulloch were associated investigators for the successful large ARC application with Dr Murray-Wallace entitled "*Late Quaternary sea levels: the south Australian Gulf's region in a global context*".

Professor R. Grün, Professor M. McCulloch and Dr N. Spooner were Associated Investigators of the successful ARC grant of Dr Magee, Department of Geology, The Faculties, "*The environmental context of megafaunal extinction in Australia*".

Dr G.O. Hughes is co-inventor with S.B. Dalziel and B.R. Sutherland on a US Patent for 'Digital Schlieren'.

Professor I. McDougall was awarded a grant from the Australian Institute of Nuclear Science and Engineering to facilitate irradiation of geological samples in the HIFAR nuclear reactor, operated by the Australian Nuclear Science and Technology Organization, in relation to dating of rocks by the  $^{40}\text{Ar}$ - $^{39}\text{Ar}$  method.

Dr H. McQueen collaborated with staff of AUSLIG on absolute gravity measurements and instrument calibrations at the Mt Stromlo Gravity Station in support of the Superconducting Gravimeter installation .

Dr H. O'Neill received an ARC RIEF grant of \$500,000 towards the purchase of a new electron microprobe. The proposal was a joint collaboration with Dr L. Ellis (Geology, the Faculties), Dr L. Jaques (AGSO), Professor K. McQueen (University of Canberra), Professor

S. Campbell (ADFA, University of NSW) and Dr C. Lennard (Australian Federal Police). The new instrument is to be housed at RSES.

Dr B. Pillans was appointed as a Research Associate of the New Zealand Institute of Geological & Nuclear Sciences.

Dr. M. Sambridge and Dr J. Braun have continued to distribute the computer software program (NNquick) for scattered data interpolation. In 2000 researchers from numerous national and international institutions requested and received a copy of the program.

Professor S. Webb is currently the Secretary for the IASPEI/IAVCEI, Inter-Association Commission on Physical and Chemical Properties of Materials of the Earth's Interior.

Dr I.S. Williams was a member of the University's Electron Microscopy Review Panel which was convened in July.

## **OUTREACH AND WORKSHOPS**

Professor S.F. Cox presented a lecture on applications of advanced structural geology techniques in minerals exploration to geoscientists at WMC Resources Ltd St Ives Gold Operations, at Kambalda, WA. He provided informal advice in the field to WMC Resources geoscientists at the St Ives Gold Operations. He is also a member of the committee of the ACT Board of Secondary Studies which oversees Year 11/12 curricula in Earth Sciences.

Professor R. Grün and Dr N. Spooner were part of a production of the Canadian Television "Discovery Channel" on the human colonisation of Australia and Megafauna extinction.

Dr I.S. Williams hosted two visits to the ion probe laboratory by 50 high school students from the National Youth Science Forum in January. He also hosted a visit to the SHRIMP in March by 20 science students from Canberra Girls Grammar School and in September by Mr F. Young, a member of the science staff from Hawker College. In January he supervised Mr R. O'Leary, ANU Geology Department, for two weeks of work experience spent jointly at RSES and Australian Scientific Instruments, Fyshwick.

## **POSTGRADUATE AWARDS AND SCHOLARSHIPS**

### **Australian National University Scholarship**

Mr T.-K. Hong  
Mr S. Sommacal

### **Australian Postgraduate Award:**

Ms N.J. Abram

### **Australian Postgraduate Award (Industry):**

Ms A. Stoltze

### **International Postgraduate Research Scholarship:**

Mr T.-K. Hong  
Mr S. Sommacal

### **John Conrad Jaeger Scholarship**

Ms N.J. Abram

**A.L. Hales Honours Year Scholarship:**

Mr T. Wyndham	Australian National University
<i>Project:</i>	Lanthanides and Nd isotopes in coastal <i>Porites</i> coral
<i>Supervisor:</i>	Professor M. McCulloch (RSES)
Ms C. Farmer	Australian National University
<i>Project:</i>	Investigations of earthquake location techniques
<i>Supervisors:</i>	Professor B.L.N. Kennett, Dr M. Sambridge (RSES) and Dr P. Chopra (Geology, ANU)

**SCHOOL SEMINARS**

<i>Date</i>	<i>Presented by</i>	<i>Topic</i>
20 January	Dr K. Gallagher <b>Imperial College London</b>	The onshore evolution of passive continental margins
24 January	Dr R. Gibson <b>University of Witwatersrand Johannesburg</b>	The Vredefort impact structure - combining impact science and metamorphic petrology
3 February	Dr M. Elwood <b>University of Liverpool</b>	Zinc in diatom opal: Paleo-oceanographic implications
17 February	Dr J. Hermann <b>RSES</b>	Subduction of continental crust: Field evidence, petrology and experimental constraints
24 February	Dr T. Esat <b>Geology</b>	Rapid climate change: Forward to the past
2 March	Dr C. Meriaux <b>RSES</b>	Dyke trajectories and dyke swarms
9 March	Dr M. Barton <b>University of Arizona</b>	Mineralized and barren lithophile-element magmatic hydrothermal systems in the western US – or how not to make ore deposits
16 March	Professor J-i Matsuda <b>Osaka University</b>	Origin of Diamonds in Meteorites - Noble Gas Approach
23 March	Dr J. Mavrogenes <b>RSES</b>	Broken Hill revisited
30 March	Dr J. Cline <b>University of Nevada Las Vegas</b>	The Getchel Mine Nevada

4 April	Dr G. Batt <b>Yale University</b>	The evolution of the Southern Alps of New Zealand from thermochronology past present and future
13 April	Professor K. Farley <b>University of Melbourne</b>	Apatite He dating: principles and applications of a new low-temperature (70°C) thermochronometer
27 April	Dr S. Webb <b>RSES</b>	Seismic wave attenuation and the grainsize of the mantle: a laboratory perspective
2 May	Professor H.C. Halls <b>Department of Geology University of Toronto</b>	Proterozoic dyke swarms as indicators of crustal deformation in Archean shields
4 May	Dr J-M. Verstraete <b>Laboratoire Oceanographie Physique Museum-Paris</b>	Sea level trends in the western tropical Pacific in 1975-1998 and ENSO research
11 May	Dr A. Glikson <b>RSES</b>	Discovery of Woodleigh a 120 km-large multi-ring impact structure east Sharks Bay W.A. - an Australian analogue of the Chicxulub crater (Mexico): Evidence of extraterrestrial origin and implications for crustal evolution
18 May	Dr R. Frost <b>Geology, ANU</b>	The origin of A-type granites: Evidence from the Sherman Granite
1 June	Dr R. Summons <b>AGSO</b>	Exploring the limits of microbial life using biogeochemical fossils
8 June	No seminar	
15 June	Professor J. Chappell <b>RSES</b>	Sea levels isotopes and climate: rapid millennial-scale events in the last 150,000 years and the extreme importance of accurate chronology.
22 June	Dr U. Faul <b>RSES</b>	Melting at mid-ocean ridges: How fast does melt move?
29 June	Professor D. Prior <b>Liverpool University, UK</b>	Microstructures in rocks: are they useful?
6 July	No Seminar	
13 July	Dr D Phillips <b>RSES</b>	Laser surgery applied to diamond exploration

20 July	Dr A Berry <b>RSES</b>	The Determination of Oxidation States by X-Ray Absorption Spectroscopy using Synchrotron Radiation
27 July	Dr C Martin <b>RSES</b>	Chemical weathering and the global carbon cycle: Insights from osmium isotopes
10 August	Dr N Arndt <b>University of Grenoble France</b>	The magmatic plumbing systems of the Caribbean Siberian and Ethiopian plateaus
17 August	M Wells <b>RSES</b>	Laboratory experiments on oceanic thermohaline convection
24 August	Dr V Hansen <b>Southern Methodist University, Dallas</b>	Tectonic evolution of Venus Earth's sister planet
31 August	Dr J Dunlap <b>RSES</b>	Tectonothermal evolution of the nascent Australian plate margin South Island New Zealand: a view through a forest of $^{40}\text{Ar}/^{39}\text{Ar}$ data
7 September	Dr R Kerr <b>RSES</b>	Thermal erosion by laminar lava flows.
14 September	J Quinn <b>RSES</b>	Constraining the Ross Embayment glacial history from raised shorelines in the Ross Sea, Antarctica.
21 September 28 September	OLYMPICS — NO SEMINAR	
5 October	Dr A Glikson <b>RSES</b>	Evidence for major 3.2+/-0.1 Ga asteroid bombardment in the Earth-Moon system with implications for early crustal evolution
12 October	Dr M Palin <b>RSES</b>	To see the world in a grain of sand: Zirconology by excimer laser ablation ICP-MS
26 October	Dr G Dipple <b>University of British Columbia</b>	The nature and significance of the isograd surface in infiltration metamorphism
7 November	Dr C Adams <b>Institute of Geological and Nuclear Sciences, Lower Hutt, New Zealand</b>	Provenance of paleozoic and Mesozoic sediment terranes in New Zealand from their detrital mineral age patterns and their radiogenic isotope characteristics



13 November	<b>Professor B Carter James Cook University of North Queensland</b>	Mid-Cenozoic origin of the Antarctic Circumpolar and Pacific Deep Western Boundary Currents
14 November	<b>Dr Y Niu University of Queensland</b>	Some surprising observations in abyssal peridotites
16 November	<b>Professor B Gulson Graduate School of the Environment, Macquarie University</b>	Advances in the use of lead isotopes in the health field
23 November	<b>Dr K Eriksson Virginia Polytechnic Institute and State University, Blacksburg, Va.</b>	Where was the moon three billion years ago?
30 November	<b>Dr I Jackson RSES</b>	Seismic wave attenuation in olivine: frequency, temperature and grain size sensitivity

## **SUMMER RESEARCH SCHOLARSHIPS**

### **SUMMER RESEARCH SCHOLARSHIPS**

Andrew Fowler <i>Project:</i>  <i>Supervisors:</i>	University of Canterbury U-Pb dating of detrital zircons using the Excimer Laser Ablation ICP-MS Drs I. Campbell, C. Allen and M. Palin, Ore Genesis (RSES)
Jong Wook Kim <i>Project:</i> <i>Supervisors:</i>	University of New South Wales Internal gravity waves in a stratified fluid Drs R. Griffiths and G. Hughes, Geophysical Fluid Dynamics (RSES)
Bronwyn O'Keefe <i>Project:</i> <i>Supervisor:</i>	Victoria University of Wellington Effect of trade-offs in confidence regions of earthquakes Dr F.E.M. Lilley, Seismology and Geomagnetism (RSES)
Martin Smith <i>Project:</i> <i>Supervisor:</i>	University of New South Wales Chronology of Australian Land Form Evolution Dr B. Pillans, Environmental Processes (RSES)
Megan Williams <i>Project:</i>  <i>Supervisor:</i>	University of Wollongong An experimental study of the univariant reaction between leucite, sanidine, forsterite and enstatite. Dr H. O'Neill, Petrochemistry and Experimental Petrology (RSES)
Kurt Worden <i>Project:</i>  <i>Supervisor:</i>	Australian National University An investigation into the geochemistry of the Jijal Complex, Pakistani Himalayas Dr I. Campbell, Ore Genesis (RSES)



<p>Mr D.R. Burbidge</p> <p style="padding-left: 40px;"><i>Supervisor:</i> <i>Advisors:</i></p>	<p>The complex evolution of accretionary wedges and thrust belts: Results from numerical experiments using the distinct element method.</p> <p>Dr J. Braun (RSES) Professor K. Lambeck, Dr M.S. Sambridge and Professor S. Cox (RSES)</p>
<p>Mr H. Cheng</p> <p style="padding-left: 40px;"><i>Supervisor:</i> <i>Advisors:</i></p>	<p>Seismic body wave attenuation in the upper mantle beneath the Australian continent.</p> <p>Professor B.L.N. Kennett (RSES) Drs O. Gudmundsson, M.S. Sambridge and I.N.S. Jackson (RSES)</p>
<p>Ms E.T. Dixon</p> <p style="padding-left: 40px;"><i>Supervisor:</i> <i>Advisors:</i></p>	<p>Noble gas geochemistry of Icelandic basalts.</p> <p>Dr M. Honda and Professor I. McDougall (RSES) Drs I.H. Campbell and V.C. Bennett (RSES)</p>
<p>Mr S.J. Fallon</p> <p style="padding-left: 40px;"><i>Supervisor:</i> <i>Advisors:</i></p>	<p>Environmental records from corals and coralline sponges.</p> <p>Professor M.T. McCulloch (RSES) Drs V. Harriott (Southern Cross), B.N. Opdyke (Geology, Faculty of Science) and C.A. Alibert (RSES)</p>
<p>Mr K.M. Fleming</p> <p style="padding-left: 40px;"><i>Supervisor:</i> <i>Advisors:</i></p>	<p>Glacial rebound and sea-level change: constraints on the Greenland ice sheet.</p> <p>Professor K. Lambeck (RSES) Drs H.W.S. McQueen, P. Johnston (RSES) and J.O. Stone (RSES/Washington State)</p>
<p>Mr A.E. Kiss</p> <p style="padding-left: 40px;"><i>Supervisor:</i> <i>Advisors:</i></p>	<p>Dynamics of laboratory models of the wind-driven ocean circulation.</p> <p>Professor R.W. Griffiths (RSES) Professor J.S. Turner (RSES), Drs S.A. Condie (CSIRO) and G. Symonds (ADFA)</p>
<p>Mr P. Marianelli</p> <p style="padding-left: 40px;"><i>Supervisor:</i> <i>Advisors:</i></p>	<p>Palaeoenvironmental proxies from Southern Australian speleothems</p> <p>Professor M. McCulloch (RSES) Professor J. Chappell (RSES), Dr J.O. Stone (RSES/Washington State), Dr L. Ayliffe (RSES/CNRS)</p>
<p>Mr J.F. Marshall</p> <p style="padding-left: 40px;"><i>Supervisor:</i> <i>Advisor:</i></p>	<p>Decadal-scale, high resolution records of sea surface temperature in the Eastern Indian and South Western Pacific Oceans from proxy records of the strontium/calcium ratio of massive <i>Porites</i> corals.</p> <p>Professor M.T. McCulloch (RSES) Professor J.M.A. Chappell, Drs M.K. Gagan (RSES) and J. Lough (AIMS)</p>
<p>Ms J.M. Quinn</p> <p style="padding-left: 40px;"><i>Supervisor:</i> <i>Advisors:</i></p>	<p>Constraining the Ross Embayment Glacial History from raised shorelines in the Ross Sea, Antarctica</p> <p>Professor K. Lambeck (RSES) Dr J. Stone (RSES/University of Washington) and Dr H. McQueen (RSES)</p>
<p>Mr J.H. Tomkin</p> <p style="padding-left: 40px;"><i>Supervisor:</i> <i>Advisors:</i></p>	<p>Landforming processes in glaciated orogens: a numerical study</p> <p>Professor K. Lambeck (RSES) Professor J.M.A. Chappell, Drs J. Braun (RSES) and W. Budd (University of Tasmania)</p>

## VISITORS

Dr M. Amalvict of the Université Louis Pasteur in Strasbourg visited for two weeks in March to conduct observations using their FG5 Absolute gravimeter at the superconducting gravimeter site at Mt Stromlo.

Ms M. Barnes, Department of Geosciences, Texas Tech University, Lubbock, visited the Ion Probe group for a month in July-August to work with Dr I.S. Williams on measuring the age of Proterozoic basement rocks from the Texas panhandle using zircon extracted from very small samples of cuttings recovered from oil exploration wells.

Dr A.A. Bidhokti of the University of Tehran, Iran, began a one-year stay in the Geophysical Fluid Dynamics Group from October, and commenced experimental studies of the interaction of internal waves and thermohaline instabilities in the oceans.

Dr I. Buick, La Trobe University, and Ms J. Miller, Monash University, visited the Ion Probe group for a week in February to work with Dr I.S. Williams as part of an ongoing collaborative study of high grade metamorphism in the Harts Range, central Australia.

Dr J. Bye of the Mathematics Department, Melbourne University, was a Visiting Fellow in the Geophysical Fluid Dynamics Group from 24 to 28 July, where he investigated the process of momentum transport from the atmosphere to the sea surface.

Professor K.V. Cashman of the Department of Geological Sciences, University of Oregon, USA, was appointed a Visiting Fellow in the Geophysical Fluid Dynamics Group from 24 August to 14 September to commence a new collaboration with Professor Griffiths and Dr Kerr, including trial experiments with solidification in channelised basaltic lava flows.

Dr S.W.J. Clement, from Ion Optical Consulting, Crapeud, visited the Ion Probe group for three weeks in February to work with members of the Geochronology and Isotope Geochemistry group on SHRIMP-related matters.

Professor W. Compston was a Visiting Fellow, an Emeritus Professor and a University Fellow in the Geochronology and Isotope Geochemistry group.

Dr L. Danyushevsky, University of Tasmania, visited the Petrochemistry and Experimental Petrology Group to cooperate with Dr S. Eggins on laser ablation ICP-MS analysis of melt inclusions from the Siqueiros Fracture Zone.

Professor D. DePaulo arrived in August to spend a sabbatical of approximately one year with the Geochronology and Geochemistry Isotope group.

Ms D. Derrien visited Dr M. Bird for three months on secondment from Ecole Supérieure de Lyon, to work on soil texture effects on the isotopic composition of soil carbon.

Dr G. Dipple, from the Department of Earth and Ocean Sciences, University of British Columbia, visited for three weeks in October to work on high pressure and high temperature experimental techniques used to measure permeability and investigate fluid-rock reaction processes in the Petrophysics Group.

Professor K. Eriksson from Virginia Polytechnic Institute and State University visited the Ore Genesis Group for six months to work with Drs Campbell, Allen and Palin dating zircons from major North American rivers by laser ablation ICP-MS.

Dr K. Farley, California Institute of Technology, Pasadena, visited the School in April for a few days and gave a talk on the U + Th/He dating technique.

Associate Professor I. Ferguson of the Department of Geological Sciences, University of Manitoba, Canada, visited RSES during June, and worked on the interpretation of the Carpentaria conductivity anomaly. He gave a Seismology and Geomagnetism group seminar on "Magnetotelluric investigations from the LITHOPROBE SNORCLE Transect, Canada: from the Archean Slave Province to the margin of the Cordillera". He also described plans for the Canadian POLARIS project, in which he is a major investigator.

In January Dr K. Gallagher of Imperial College, UK, visited RSES to work with Dr. J. Braun on thermal modelling of the continental crust with the purpose of better interpreting fission track data. He also collaborated with Dr M. Sambridge on the application of the neighbourhood algorithm to problems in thermal history estimation.

Dr J. Gamble, Victoria University of Wellington, worked with Dr S. Eggins, Petrochemistry and Experimental Petrology Group, on laser ablation ICP-MS analysis of peridotite and deep crustal granulite xenoliths from Antarctica.

Dr J. Goodge, Southern Methodist University, arrived in early July to spend a six-month sabbatical in the Ion Probe group, during which he is working with Dr I.S. Williams and Mr M. Fanning in a collaborative study of the record of the history of the Antarctic craton and Neoproterozoic to early Palaeozoic sedimentation as exposed in the Transantarctic Mountains.

Professor V. Hansen of the Department of Geology, Southern Methodist University, USA, spent six months in the Geophysical Fluid Dynamics Group developing theories for tectonics on Venus.

Dr W. Hantoro and colleagues, Center for Geotechnology, Indonesian Institute of Sciences, visited the Environmental Processes Group from 4 September to 24 November. They worked with Dr M. Gagan to measure stable isotope ratios in fossil corals to reconstruct the Holocene climatic history of the Indonesian maritime continent.

Professor S. Harley, Edinburgh University, Dr V. Oversby, Stockholm, Professor R. Cliff, University of Leeds, and Dr R. Stern, Geological Survey of Canada, visited the Ion Probe group briefly during the year to discuss matters pertaining to SHRIMP analysis.

Dr A. Hitchman visited RSES for a year while preparing to go to England. He worked particularly with Dr F.E.M. Lilley on developments from his PhD research, and contributed to the Fourth Geomagnetic Workshop held in Canberra in April.

Mr A. Hogg, a PhD student in the Centre for Water Research, University of Western Australia, visited the Geophysical Fluid Dynamics Group from 20 to 23 March and 9 to 10 October in order to discuss the effects of mixing on buoyancy-driven exchange flows between ocean basins and marginal seas.

Mr C. Ihlenfeld of La Trobe University worked with the Environmental Processes Group in October to measure stable isotope ratios in Late Pleistocene tufa deposits from northwestern Queensland. The work forms part of his PhD research in the Department of Earth Sciences.

Dr M. Ingham of the Victoria University of Wellington, New Zealand, visited Dr F.E.M. Lilley on study leave from October to December. Dr Ingham worked on a variety of problems concerning electromagnetic methods in geophysics and gave a Seismology and Geomagnetism group seminar on the application of these methods to geological problems in New Zealand.

Dr. J. Lee from Queen's University, Canada visited the Geodynamics Group for a period of 10 weeks from August to October to work on the development of numerical methods to study the diffusion of Argon in rocks.

Dr J.-P. Li of the Chinese Academy of Sciences, Guangzhou, arrived in December to work with Dr H. O'Neill and Professor D.H. Green on the origin of Tibetan shoshonites

Professor D. Liu and Ms Y. Wang (Chinese Ministry of Land and Resources), Ms B. Wu and Ms Y. Zhang (Chinese Ministry of Science and Technology), Mr B. Huo (Chinese Ministry of Finance) and Mr X. Fang (Chinese National Research Centre for Certified Reference Material) visited RSES in December to study the laboratories, instrumentation and sample preparation facilities for isotope analysis in connection with the purchase of a SHRIMP II ion microprobe by the Ministry of Land and Resources, Beijing.

Dr J.I. Matsuda of the University of Osaka was a visitor in the Geochronology and Isotope Geochemistry Group for two months under scientific exchange arrangements between Japan and Australia. His primary interest is noble gas geochemistry and its applications to the study of the Earth's origin and evolution.

Mr I. McCulloch visited the luminescence laboratory to work on technical development and software construction for the photon-counting imaging system (PCIS) project, and to apply the PCIS to single-grain optical dating in karst geomorphology.

Ms S. McLaren, a PhD student from the Department of Geology and Geophysics, University of Adelaide, spent two months in RSES early in the year undertaking  $^{40}\text{Ar}$ - $^{39}\text{Ar}$  age spectrum measurements on samples from the northern Flinders Ranges, South Australia, as part of a project being undertaken with Dr M. Sandiford, University of Adelaide, and now University of Melbourne.

Professor G. Miller, Colorado, visited Environmental Geochemistry and Geochronology for collaborative study using optical dating, TIMS and AAR to investigate the timing of the extinction of *Genyornis newtoni*.

Dr K. Niida, Hokkaido University, Japan briefly visited the Petrochemistry and Experimental Petrology Group to work with Professor D.H. Green on the origin of massive peridotites.

Dr P. Nimis from the University of Padova, Italy, visited the Petrochemistry and Experimental Petrology Group in April-May to complete joint projects with Professor D.H. Green and Dr W.R. Taylor.

Dr Y. Niu, University of Queensland, visited the Petrochemistry and Experimental Petrology Group to work with Dr S. Eggins on laser ablation ICP-MS analysis of basaltic glasses from East Pacific Rise Seamounts and mid-ocean ridge system.

As part of an agreement between RSES and the University of Sao Paulo, Brazil, Dr A.P. Nutman and Dr K. Sato visited the Ion Probe group for two weeks in July, and Dr Nutman and Dr M. Basei visited the group for two weeks in November to run a series of samples on the SHRIMP I ion probe.

Ms T. Pedersen, an IAESTE student from Denmark, visited RSES from June to September.

Dr R. Price, University of Waikato, cooperated with Dr S. Eggins, Petrochemistry and Experimental Petrology Group on geochemistry and petrogenesis of the Southern Longwoods Complex, New Zealand and on laser ablation ICP-MS analysis of glasses in xenoliths from Ruapehu Volcano.

Dr D.J. Prior, University of Liverpool, visited the School in June and delivered a seminar detailing the wide range of applications of electron backscattered diffraction to geology.

Ms D. G. Questiaux visited the luminescence laboratory to investigate validity of single-grain quartz optical dating protocols, along with means of dating which reduce reliance on U and Th disequilibria in environmental dosimetry.

Professor T. Sato of the National Astronomical Observatory of Japan visited the Geodynamics group in November to work with the superconducting gravimeter at Mt Stromlo and discuss analysis of observations.

Dr M. Schmidt, CNRS, Clermont-Ferrand, France, arrived in November to work with Professor D.H. Green on an investigation of island arc ankaramites using some of the Vanuatu compositions with extremely magnesian olivine and clinopyroxene.

Mr D. Short (formerly CSIRO Division of Land and Water) is visiting the luminescence laboratory to develop data analysis algorithms and to extend a numerical model of luminescence processes.

Dr H. Stünitz, University of Basel, visited the Petrophysics Group for four weeks in May. The main purpose of the visit was to carry out microstructural study on some plagioclase materials which had been experimentally deformed at Brown University.

Professor J.S. Turner was a Visiting Fellow, an Emeritus Professor and a University Fellow in the Geophysical Fluid Dynamics Group.

Dr S. Vergnolle of the CNRS, Paris, France, was a Visiting Fellow in the Geophysical Fluid Dynamics Group from January to May, and continued experimental studies of foaming flows begun during her earlier International Fellowship (ARC) with the Group.

Associate Professor C. Woodroffe, Department of Geosciences, University of Wollongong, visited the Environmental Processes Group to prepare corals for stable-isotope analysis as part of a collaborative project with Dr M. Gagan to reconstruct the late-Holocene climate of the equatorial central Pacific.

Mr G. Yan of Deakin University worked with Dr M. Gagan, Environmental Processes Group, in February-March to measure stable isotope ratios in Permian brachiopods from the Tibetan plateau. The work forms part of his PhD research in the School of Environmental Science.

Mr Z. Youping from the Department of Organic Chemistry, South China Agricultural University has been working with Dr M. Bird on a one-year Chinese Government Scholarship, looking at climate effects on soil carbon storage.