AFM Cantilevers Update

In a recent issue of the PFPC Bulletin (January – June 2003), we reported on the discovery by PFPC Executive Member Associate Professor John Sader that V-shaped cantilevers used in the Atomic Force Microscope do not offer the advantages they are purported to have. Instead of minimising the effects of torsion, a property that has underpinned their usage, V-shaped cantilevers actually increase twist. In that issue, the following question was asked:

Do we need V-shaped cantilevers at all? In this issue, we report on the impact of this finding in the short time since its announcement in 2003.

At the heart of the AFM lies a force-sensing cantilever. Typically between 100 and 200 microns long, the AFM cantilever is scanned across a surface to generate a topographic image or measure surface properties. The first cantilever design (1987) incorporated a simple rectangular geometry, closely resembling a diving board. Soon after, the more complex V-shaped geometry was introduced (1987) with the explicit intent of minimising the effects of lateral forces, which can be detrimental to performance. This has led to current day industry standards, which utilise a combination of rectangular and V-shaped cantilevers, depending on the application.

Importantly, V-shaped cantilevers have been used widely in applications where the effects of torsion are to be minimised, such as and force measurements, including colloid probe measurements.

Intuitively, it seems entirely reasonable that V-shaped cantilevers must provide higher resistance to twisting in comparison to rectangular cantilevers, with the skewed arms of the V-shape providing the extra support. John’s research proves that such intuitive analysis leads instead of minimising the effects of torsion, a property that has underpinned their usage, V-shaped cantilevers actually increase twist. In that issue, the following question was asked:

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These findings by John Sader have led to global attention and publicity in the international scientific media, including a report in the key general science magazine Scientific American. Leading AFM manufacturers have responded to this finding, by modifying their product lines. Significantly, one of the world's largest manufacturers, Veeco, USA, has now replaced their widely used silicon V-shaped cantilevers with a new series of rectangular cantilevers. In their product flyer features the headline of “a rectangular cantilever to minimize lateral forces”, the discovery that John reported less than 18 months ago. They also state that the new cantilevers offer superior performance in “nearly every facet of operation”, supporting John's recommendations.

Given the short timeline since announcement of the discovery, its appearance on the international market is truly significant. With the key operating principle of the V-shaped cantilever removed, and leading manufacturers moving towards rectangular designs, the stage is now set for the global usage of rectangular cantilever in AFM applications.

Passing the Baton

Professor David Boger announced over 18 months ago that he would retire at the end of 2004 and in doing so step down as Director of the PFPC. It was at this time that Professor Tom Healy also announced he would step aside as Deputy Director. Given that this was decided at the start of 2003 there has been ample time for succession planning by the Centre’s Executive and Advisory Board and smooth implementation of this succession plan. As a result of these changes to the Directorship the Australian Research Council (ARC) conducted an ad hoc review of the Centre in November. Soon after this review the ARC advised The University of Melbourne that they had approved the appointment of Professor Geoff Stevens as Director of the PFPC. Professor Franz Grieser will join Professor Derek Lukey and Professor Geoff Stevens along with Professor David Boger and Professor Thomas Healy in their semi-retirement. David and Tom have been integral members of the Centre and both will remain actively involved in the PFPC in their semi-retirement. David will take on the role as Chair of the Advisory Board and Tom as Chair of the new Scientific Advisory Committee to be formed in 2005.

Members of the PFPC will receive over $6 million in new Australian Research Council (ARC) funding following the announcement of the results from the 2004 funding round. Fifteen new grants have been awarded to members of the PFPC including nine ARC Discovery grants, three ARC Linkage - Infrastructure Equipment & Facilities (LIEF) grants and two ARC Linkage Project grants along with one National Health and Medical Research Council (NHMRC) Project grant. Many of the new grants involve the Centre’s research and industry collaborators within Australia and overseas. Included in this new funding is a LIEF grant totalling $932,870 which will enable the purchase of state of the art equipment for a Materials and Surface Characterisation Facility. PFPC members involved in this grant include Professor Frank Caruso, A/Professor Dave Dunstan, A/Professor Paul Mulvaney, Professor Jannie van Deventer, Dr Grant Lukey, and Professor Geoff Stevens along with the Centre’s new Federation Fellow Professor William Ducker. The multi-user facility will provide PFPC researchers and other research groups across the University of Melbourne, Monash University, RMIT University and CSIRO with a suite of analytical instruments essential in the development of advanced materials.

Two ARC Discovery project grants in the nanomaterials area were also awarded. A/Professors Paul Mulvaney and John Sader in collaboration with Professor Luis Liz-Marzán (Univ. of Vigo, Spain), Dr Greg Hartland (Univ. of Notre Dame, USA) and Dr Michael Giersig (CAESAR, Germany) will receive $1 million over 5 years for an ARC Discovery project that will explore how ultrasmall mechanical devices made from molecules and small crystals work. Federation Fellow Professor Frank Caruso and Dr John Quinn along with collaborator Professor Tom Davis (Univ. of NSW) were also awarded a 5 year grant totalling $1.3 million that will use advanced polymer chemistry to develop “smart” polymers that can controllably respond to changes in their surroundings. These “smart nanomaterials” are expected to find application in the agricultural and pharmaceutical sectors. This grant includes an Australian Postdoctoral Fellowship awarded to PFPC researcher John Quinn.

Professor Peter Scales was successful with two ARC Linkage project grant applications. Peter in collaboration with fellow PFPC member Dr Ross de Kretser and industry partner Rio Tinto will receive $340,000 over 3 years from the ARC for a project that aims to provide a quantitative basis for selection, design, operation and maintenance of filter devices. The findings from this project are expected to reduce the incidence of poor operational outcomes for filter presses and provide a sound basis for the maintenance of filter cloths and membranes used by the minerals industry. Peter in collaboration with PFPC Industrial Fellow Dr David Dixon and industry partner Fontemara Cooperative Group Limited was also awarded a 3 year grant totalling $288,882 which will aid in determining the best choice of dewatering methodologies for the treatment and disposal of wastes which will allow for better strategic design and management of waste treatment options for the dairy industry.

Other ARC Discovery grants awarded to researchers associated with the PFPC included the following:

- A/Professor Michelle Gee in collaboration with Dr Andrew Clayton and A/Professor Ed Nice (Ludwig Institute for Cancer Research) for a project titled “Probing membrane rafts using surface-selective multi-dimensional microscopy”, Total: $410,000 over 3 years
- Professor Franz Grieser and Dr Mathupandian Ashokkumar in collaboration with Dr Gareth Price (Univ. of Bath, England), Dr Tom Matula (Univ. of Washington, USA) and Dr Kyuichi Yasui (AIST, Japan) for a project titled “Control of acoustic cavitation in complex fluids”, Total: $454,000 over 3 years
- Dr Grant Lukey and Professor Jannie Van Deventer for a project titled “Design of advanced geopolymeric materials based on nanostructural characterisation and modelling”, Total: $328,000 over 3 years
- Dr Andrea O’Connor and A/Professor Kerry Landman in collaboration with A/Professor Justin Cooper-White (Univ. of Queensland) and Dr David Lewisley (Queensland Univ. of Technology) for a project titled “Mastering the microenvironment - Integrated, functional, biosynthetic scaffolds for tissue engineering”, Total: $460,000 over 3 years
- Dr Jiliska Perera in collaboration with Dr Spas Kolev (Univ. of Melbourne) and Professor Robert Catrall (La Trobe Univ.) for a project titled “New extraction membranes and beads for use in industrial separation”, Total: $345,000 over 3 years

Continued from front page
Continued from page 3

Dr Antoinnette Tordesillas for a project titled “Seeing the discrete in a continuum: an integrated numerical-rheological-experimental approach towards high resolution microchemocontaminant models of granular media”, Total: $178,000 over 3 years

Professor David Boger will also be involved as a Partner Investigator on an ARC Discovery grant awarded to A/Professor Justin Cooper-White, A/Prof Malcolm Davidson (Univ. of Melbourne) and PFPC Board Member Professor Gareth McKinley (MIT, USA) for a project titled “Micro Process Plants - Non-Newtonian flow and particle synthesis in confined geometries”, Total $895,000 over 5 years.

Members of the PFPC were also involved in two other successful ARC LIEF Grant applications.

New PFPC Members

Welcome to the following researchers and students who recently joined the PFPC.

Postdoctoral Research Fellows

Dr Anthony James is a Royal Society Visiting Fellow (UK) working in the Nanostructured Interfaces and Materials group led by Professor Frank Caruso where he will be patterning particles through metallisation.

Dr Angus Johnston has joined Professor Frank Caruso’s Nanostructured Interfaces and Materials group. Angus will be investigating thin films of biopolymer layers.

Will Mulholland is a recipient of an 1851 Research Fellowship from the Royal Commissions for the Exhibition of 1851, UK. He will be studying novel drug delivery systems.

Chris Rigby has joined the Contaminated Site Remediation in Antarctica research program led by Professor Geoff Stevens. Chris will be overseeing the implementation of a pilot scale permeable reactive barrier for an oil spill near Casey Station, Antarctica.

Dr Alexander Zelikin is a Research Fellow conducting research in the Nanostructured Interfaces and Materials group led by Professor Frank Caruso. One of his key activities will be to study DNA particle formation.

A/Professor Paul Mulvany in collaboration with colleagues from the University of Melbourne and other Universities for a grant titled “High-speed ultra-centrifuge facility with sensitive scanning optics for the analysis of interacting biomolecules”, Total $512,744

Professor Geoff Stevens in collaboration with colleagues across several Universities is involved in a grant titled “Advanced surface imaging and spectroscopy facility”, Total $406,000

In addition to these ARC grants, an NHMRC project grant was awarded to A/Professor Michelle Go (Chief Investigator) and Dr Ray Dagastine (Associate Investigator) along with fellow collaborator Professor Michael Hill from the University of NSW. This 3-year grant (totaling $409,750) will be administered by the University of NSW and is entitled “Adaptive Behaviour of the Arteriolar Wall”.

Key PFPC Participation at Asia-Pacific Conferences

The July – December period was a busy time for PFPC members with a number of them playing major roles in conferences around the Asia-Pacific region.

During the week of 23 August the XVth International Congress on Rheology was held in Seoul, Korea. More than 650 people from all over the world attended the Congress, organised by the Korean Society of Rheology. Professor David Boger was the Opening Plenary Speaker at the Congress, where he delivered a lecture “From macro to microscopic flows”. Professor Peter Scales presented an invited keynote lecture “The compression rheology of suspensions”, while students Lucy Rodd and Joeksa Hushy also presented papers. The PFPC has a very close friendship with the Korean rheology community. Peter is now President of the Australian Society of Rheology and this year represented the Asia-Pacific region on the International Committee on Rheology. Australia and Korea publish a joint journal, The Korea-Australia Rheology Journal. David will take on the role of Australian Editor of this journal in his retirement.

From left to right are: Professor Jae Hyan, Korea University, who was the conference organiser of the XVth International Congress on Rheology; Professor Manfred Wagner, Berlin Technical University, who is the new International Secretary of the International Committee on Rheology; Professor Ki-Jun Lee, Emeritus President of Seoul National University, eminent chemical engineer and rheologist who has played a major role in bringing the chemical engineering communities in Korea and Australia closer; and on the right is Professor David Boger.

Immediately after the Korean congress, during the week of 30 August, members of the PFPC attended the 7th International Hydrocolloids Conference, in Melbourne organised by Associate Professor Dave Dunstan, who is a member of the PFPC. Professor David Boger opened the conference with a Plenary Lecture, entitled “Exploiting the rheology of hydrocolloids”. Professor Frank Caruso also presented a Plenary Lecture entitled “Nanoengineered colloid-based materials for controlled delivery” and PhD Student Alex Lubansky, presented a paper at the Conference. A range of topics were covered during the conference including molecular structure and interactions, novel characterisation methods, rheology, hydrocolloids in emulsions/surface chemistry, and applications to food, dairy, medical and the pharmaceutical industries.

During September the 2004 Australia-Japan Symposium was held as part of the 57th Divisional Meeting on Colloid and Interface Chemistry of the Chemical Society of Japan. The Divisional Meeting had 650 registrants and 7 parallel sessions with some 400 papers and 188 posters. It was pleasing to see that the Australia-Japan session covered as much as any other session of the Divisional Meeting over the 3 days. It is a clear indication of the overwhelming success of the Australia-Japan Symposium. Professor Tom Healy along with Professor Neil Furlong, Professor Toyoki Kunitake and Professor Yoshio Okahata were the key instigators behind the first Australia-Japan Colloid Conference, held in Fukuoka, Japan in 1992. The Australia-Japan Symposium has helped to establish extensive collaborative research efforts between Australia and Japan. The PFPC was represented at this most recent meeting, by Professor Tom Healy, Professor Franz Grieser, Professor Geoff Stevens, Professor Derek Chan and Dr Benno Radt, who all presented valued papers.

This followed in early October with the 6th Engineering Conference International Meeting on Separations Technology, at Fraser Island, Queensland, Australia. The conference focussed on the engineering challenges of capture and reduction of greenhouse-gas emissions, supply of economic and safe urban water and the development of low environmental footprint minerals extraction processes. Conference attendees came from around the globe including Europe, USA, Japan, China as well as Australia. Attending PFPC Director Professor Geoff Stevens was a member of the International Organizing Committee. Geoff along with fellow PFPC members Professor Peter Scales and PhD students Kelly Yung and Julianna Franco represented the Centre at this Meeting.

The PFPC is proud to have played a major role in these conferences.
PFPC Symposium

Coinciding with the PFPC’s Advisory Board Meeting the Particulate Fluids Processing Centre held a half day Symposium on Tuesday 9 November. The Symposium provided PFPC students and staff with the opportunity to hear from an impressive line up of internationally distinguished scientists and engineers. PFPC Advisory Board Members Professor Brig Moudgil, Dr Richard Buscall and Professor Graeme Jameson participated in the symposium along with the PFPC’s Professor David Boger and Professor Tom Healy.

The Symposium opened with a presentation by Professor Brig Moudgil, Director of the Particle Engineering Research Centre at the University of Florida, USA entitled “Nanoengineered particulate based systems for enhanced performance in microelectronics, pharmaceutics and process industries”. Brig is Director of a Centre funded by the National Science Foundation in the USA, a funding scheme for research centres that is analogous to the ARC’s funding scheme for Special Research Centres.

Dr Richard Buscall, from the ICI Strategic Technology Group, UK followed with a very entertaining talk on “Growth of colloidal particles and microphases by controlled precipitation”. Richard has had a long association with the Centre and took the opportunity to revisit some of the research that he and PFPC member Professor Peter Scales collaborated on in the late 1980’s.

Introduced by Professor David Boger as “one of Australia’s living treasures” Professor Graeme Jameson, inventor of the Australian Jameson cell, gave a presentation on “Bubbles, drops and particles” highlighting several of the research projects that are being undertaken in the ARC Special Research Centre for Multiphase Processes in Newcastle, NSW of which he is Director. Graeme’s visit led to fruitful discussions with PFPC researchers and it is hoped that a new collaborative research project between the two centres will be established in the not too distant future.

Professor Tom Healy talked on one of his favourite research topics (“The electrical double layer at non-polar solid and liquid-aqueous interfaces”) which highlighted an area of research that he has been re-examining of late which he first began with Professor Doug Fuerstenau, of the University of California, Berkeley in the 1980’s. The symposium concluded with Professor Boger discussing some very exciting observations in the field of microfluidics in a presentation titled “From macroscopic to microscopic flows: something old, something new, and something very new”.

We were delighted that Professor Jae Chun Hyun, who is Director of the Applied Rheology Center (ARC) at Korea University, in Seoul also had the opportunity to present an overview of his Centre and research during his visit.

We thank our Board Members for participating in the Symposium and for providing staff and students with the opportunity to hear about their exciting research programs.

PFPC Advisory Board Members Professor Brig Moudgil, Professor Jae Chun Hyun, Professor Tom Healy, Dr Richard Buscall, Professor David Boger and Professor Graeme Jameson.

PFPC Graduate Profile

Kathy (second from right) with her research students at the Kanazawa Institute of Technology, Japan. As a result of the success of Kathy’s PhD she recently received the Alstom Power award for engineering excellence, jointly awarded by IE Aust and IChemE. This award is in recognition of outstanding contributions in the industrial field from a chemical engineer under 30 years of age.

I commenced postgraduate studies at the University of Melbourne in 2000, under the supervision of Professor Geoff Stevens. This research focussed on the development of site remediation technologies for cold regions, resulting in the design, construction and commissioning of a mobile water treatment system specifically for use at remote cold-regions contaminated sites. The water treatment system was used to treat waters from a former waste disposal site near Casey Station in Antarctica, during removal of wastes from a permeable reactive barrier for the treatment of contaminated waters in Antarctica.

Andrei Woinarski (PhD)
Development of natural zeolite permeable reactive barrier for the treatment of contaminated waters in Antarctica
Supervisors: G Stevens and M Connor

Christina Yip (PhD)
The role of calcium in geo-polymerisation
Supervisors: J van Deventer and G Lukay

Millie Wun (PhD)
The kinetics and mechanism of the micelle-to-vesicle transition in cationic surfactant solutions
Supervisors: A O'Connor and F Grieser

Recent Graduates

Congratulations to the following PFPC students who have recently completed the requirements of the degree of Doctor of Philosophy.

Rohan Trenson (PhD)
The effect of surface active solutes on sonoluminescence in aqueous solutions
Supervisors: F Grieser and M Ashokkumar

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After finishing a 5 year University degree majoring in Chemistry at the University of Neuchâtel, I worked for 6 months at Novartis, a pharmaceutical company based in Wallis, in the south of Switzerland. I then started my PhD also at the University of Neuchâtel, with Professor Helen Stoeckli-Evans in collaboration with Professor David Fenton, at the University of Sheffield, England. My PhD thesis focussed on the synthesis and characterisation of tetra-substituted pyrazine based organic ligands and their bi-complexation with metallic ions, which have great potential as magnetic materials.

In 2003, I received a 1 year postdoctoral fellowship from the Swiss National Science Foundation to do research in the PFPC’s Nanoparticle Lab led by Associate Professor Paul Mulvaney. His research is quite diverse and I was very interested in combining research with both the AFM and nanoparticles. My main project here in the PFPC is based on fabricating 2D and 3D arrays of CdSe@ZnS quantum dots (QDs) and studying their properties using confocal microscopy, AFM and near-field scanning optical microscopy. Such systems show potential for a large range of applications, including photonic crystals used in waveguides or information storage. I am also interested in working in the general area of atomic force microscopy (AFM) particularly imaging and characterization of cantilevers. I have found my time here at the PFPC very interesting so much so that I decided to apply for a 6 month extension to my fellowship which I am happy to say was successful.

Collaboration is I think the main key in research. I have found the last two years to be the most exciting and engaging of my research career. In collaboration with researchers across the PFPC we have made some exciting discoveries in examining both the behavior of surface forces between oil droplets and the hydrodynamic drainage between droplets on a length scale never before examined by using AFM. I have also had the opportunity to work in other PFPC research areas including fun flotation, diatom adhesion to surfaces, and studying the dynamic forces and stability in nanoparticle synthesis.

In September I was appointed as a senior lecturer in the Department of Chemical and Biomolecular Engineering, here at the University of Melbourne. I plan to establish a research program in the area of the interaction forces in “soft colloids” and complex fluids and apply this expertise to problems relevant to living systems on the cellular level. I look forward to continuing to be a part of the PFPC.

Dr Raymond R. Dagastine

As the Shell Graduate fellow, I completed my PhD in Chemical Engineering in 2002 from Carnegie Mellon University, USA on colloidal force measurements using atomic force microscopy (AFM) and total internal reflection microscopy. I came to the PFPC for a two year international postdoctoral research fellowship funded by the National Science Foundation to study the interactions between emulsion droplets using AFM. These fellowships are designed to encourage US researchers to make research connections and gain experience outside the US.

I was initially attracted to the PFPC as a host institution for my fellowship based on the centre’s world renowned reputation for high quality research in colloids and the diversity in research background of the people in the PFPC. The other significant aspect to me was that the PFPC provided the opportunity to learn about new areas and expand my research directions because of the diversity of the people and research at the centre.

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Muthupandian Ashokkumar visited the University of Washington, Seattle, USA from 8-14 November to conduct a series of experiments using the Active Cavitation Detector in the Applied Physics Laboratory (APL). The Active Cavitation Detector was used to measure the “inertial cavitation activity” of microparticles in aqueous solutions containing a number of surface active solutes. The effects of ultrasound power, pulse length and pulse repetition frequency on the extent of inertial cavitation activity were investigated in collaboration with Dr Tom Matula at APL during this visit. Whilst in the USA, Ashok also attended the 14th Meeting of the Acoustical Society of America in San Diego from 15-19 November.

Sasha Boskovic visited the Department of Applied Physics, at Curtin University of Technology, Western Australia to undertake small angle x-ray scattering (SAXS) experiments with Dr Craig Buckley (22-27 August)

Steve Carrie was a member of the Organizing Committee for CTAC2004, Melbourne, Victoria 2004 held from 27 September to 1 October

Ray Dagastine travelled to the UK in September to attend the Faraday Discussion 129: Structure and Dynamics at Liquid-Liquid Interfaces, at the University of Cambridge, Cambridge, followed by the EURESCO Conference: Interfaces and Colloidal Systems, in Giens, France. During the visit to England Ray met with Professor Paul Luckham at Imperial College, London, UK to discuss experimental methods.

Sandra Kentish travelled to Japan in September to visit Meiji University and the National Institute of Materials Science. Sandra was also invited to give a Departmental Seminar at the Tokyo Institute of Technology on “Teaching Chemical Engineering at the University of Melbourne”.

Attended the 7th International Conference on Greenhouse Gas Technologies, in Vancouver, Canada, in September. She signed a Memorandum of Understanding on behalf of the University of Melbourne, between our own institution, the University of Regina in Canada, the University of Texas in the US and the Norwegian University of Science and Technology in order to promote and strengthen research collaboration into post-combustion capture of carbon dioxide.

In October, Sandra was invited to present a paper and participate in the Energy and Environment Workshop of the Australian China Symposium conducted by the Australian Academy of Technological Sciences and Engineering and the Australian Academy of Science, on behalf of the Australian Department of Education, Science and Training, with the Chinese Academy of Science.

Stuart Prescott attended the 18th Conference of the European Colloid and Interface Society and 27th Australasian Polymer Symposium. During a visit to the UK in September he visited a number of research groups to discuss possible future interactions, particularly on the polymer/surface chemistry front, including visits to:

- Professor Terence Cosgrove, School of Chemistry, University of Bristol, UK
- Dr Karen Edler and Dr Gareth Price, Department of Chemistry University of Bath, UK
- Professor Peter Lovell, Manchester Materials Science Centre, University of Manchester, UK
- Dr Steven Rimmer, Department of Chemistry, University of Sheffield, UK
- Professor Richard Jones, Department of Physics and Astronomy, University of Sheffield, UK
- Professor Athene Donald, Cavendish Laboratory, Cambridge University, UK

Geoff Stevens

- Attended the Victorian Geosequestration Stakeholder Workshop, organised by the Department of Primary Industries on 5 August 2004
- Visited Tsinghua University, China to plan the ISEC ’05 conference and also discuss collaboration, 27-29 September 2004
- Attended a Bioremediation Planning Meeting, Australian Antarctic Division, Melbourne, Australia, 15 November 2004
- Member of the International Organizing Committee for the ECI Separations Technology VI: New Perspectives on Very Large-Scale Operations, Fraser Island, Queensland, Australia held from 3-8 October 2004.

Shane Usher in July, Shane was a Visiting Fellow in the Department of Mathematics, at The University of Stuttgart, Germany where he worked with Raimund Bürger on numerical methods for the prediction of solid-liquid separation processes, such as thickeners and centrifuges.

Shane also visited numerous leading research groups in Europe and the USA with interests in rheology, dewatering, water treatment and wastewater treatment throughout July and August. The purpose of these visits was to explain experimental and computational methods employed at the University of Melbourne and also to gain an appreciation of methods employed in other leading research institutions. The institutions and lead researchers visited included:

- Dr Werner Stahl, Karlsruhe University, Germany
- Dr Kristian Keiding, University of Aalborg, Denmark
- Professor Gareth McKinley, MIT, USA
- Professor Lee White, Carnegie Mellon University, Pittsburgh, USA
- Professor John Novak, Virginia Tech., Ronoake, Virginia, USA
- Professor Steve Dentel, University of Delaware, Delaware, USA
- Dr Karsten Keller, DuPont, Delaware, USA
- Professor Charles Zukowski, University of Illinois, USA

Topics of discussion included the effects of shear in dewatering processes, filtration test rig development, drying in vacuum filtration and technology transfer. A mathematical analysis of long time behaviour in batch sedimentation was also commenced with Professor Lee White of Carnegie Mellon University.
David Boger
Professor David Boger attended a ceremony in the UK in December to accept a Gold Medal from the Council of the British Society of Rheology. The Gold Medal is the Society’s highest honour and in this case was awarded in recognition of Professor Boger’s outstanding contribution to the science and engineering of rheology, particularly in the areas of particulate systems, fluid elasticity and the application of rheology to industrial problems. David is the 14th recipient of the Gold Medal only 13 had previously been awarded in the 38 year history of the award.

The Gold Medal citation for David stated that: “David Boger is one of the most recognizable people in the world in our area of science – he is readily recognizable by sight, ‘by sound’ (by that I refer to his distinctive voice) and above all, by name and reputation”.

“The 14th medal being awarded today goes to a man who will make that list even more impressive than it is already.”

Tom Healy
Professor Tom Healy was selected as a finalist for the Victorian Senior Australian of the Year Award 2005 in “recognition of his contribution to the community and the nation through his commitment to science, technology and philanthropy”.

Sandra Kentish
Dr Sandra Kentish received further recognition of her commitment and enthusiasm for teaching when she was awarded a Vice-Chancellor’s Award for Excellence in Teaching. She will receive a $10,000 research grant sponsored from the Faculty for each award. These awards are in recognition of academics that demonstrate a commitment to teaching excellence and outstanding initiatives.

Professor Jannie Van Deventer, Dean of the Faculty of Engineering and a member of the PPFC Executive shown here with Sandra Kentish stated that: “Sandra clearly demonstrated her commitment to issues such as transition to the workforce for final-year students, promotion of the profession in schools and the development of tools to improve student learning.”

John Sader
Associate Professor John Sader was awarded the Woodward Medal in Science and Technology. John Sader receiving the University of Melbourne’s Woodward medal in Science and Technology.

Sabina Zahirovic
The inaugural recipient of The University of Melbourne’s School of Chemistry T W Healy Award is PPFC postgraduate student Sabina Zahirovic. The T W Healy Award will assist postgraduate students with travel expenses associated with conference attendance. The $2000 award will support Sabina to travel to the USA to present her research at the 76th Annual American Society of Rheology, in Texas, in Feb 2005.

Other Awards and Achievements

Clare Anderson
Awarded an Australian Institute of Energy Postgraduate Award for “The Best CO2 Capture Project” in August 2004 ($750)

Grant Lukey
Invited to act as Editor of a Special Edition of Journal of Materials Science on Geopolymer Technology

Jessica Paciﬁco
Received a 6 month extension to her Swiss National Science Foundation postdoctoral fellowship to continue conducting research in the PPFC

John Quinn
Received the 2004 Royal Australian Chemical Institute (RACI) Polymer Division Trolaor Prize for the best oral presentation at the 27th Australasian Polymer Symposium in Adelaide. The prize is awarded for outstanding oral presentations by early career polymer scientists at National or International Polymer Division Meetings.

Briony Rose
Represented the University of Melbourne at the International Council of Women’s Asia-Paciﬁc Regional Council Seminar, in Auckland, New Zealand, 3-6 November

Peter Scales
Elected to Fellow of the Institution of Chemical Engineers in Australia (FIChemE) and also registered with the Engineering Council (UK) as a Chartered Engineer (CEng)

Media Coverage of Research

Geff Stevens
Newspaper and radio coverage associated with latest developments in the area of tissue engineering

Highlights, Awards & Achievements