

Engineering Alumni News

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Professor Michael C.R. Davies

From the Dean

The first quarter of 2011 has brought with it enormous challenges for New Zealand and the Engineering fraternity in particular. Not least has been the impact on life and infrastructure in Christchurch of the 22 February 2011, 6.3 M Lyttleton earthquake that occurred only six months after the 4 September 7.1 M Darfield earthquake.

The response from colleagues in the Faculty to the most recent earthquake in Christchurch was immediate and exhaustive. Three academic staff from the Department of Civil and Environmental Engineering, Professor Michael Pender, Associate Professor Jason Ingham and Associate Professor Charles Clifton happened to be in the Christchurch CBD when the earthquake struck. Ironically, they were within minutes of commencing a seminar on earthquake building standards, which was attended by 84 of Christchurch's leading earthquake engineers, when the earthquake occurred. The group stayed on in Christchurch for several days after the quake to help with building inspections, both to assess immediate safety and to inform research and they were soon joined by others from the Department of Civil and Environmental Engineering. The Department's geotechnical engineers have also been engaged in assessment and research activities in areas of Christchurch that were subjected to severe liquefaction.

This year I was delighted to welcome a new cohort of academically outstanding first year students. Once again, there was fierce competition for places and this is not surprising, therefore, that many of our new students were duxes or leaders at their schools. Included in this group are new students who have had

exceptional sporting achievements with some performing internationally. We maintained the highest standards of entry criteria, with 60 students gaining the maximum possible grades in their final year examinations.

Also pleasing was the rise in the number of female students accepted into engineering both at postgraduate and undergraduate level with women representing 24 percent of our intake into the undergraduate programme and 24 percent of new postgraduate students. Sixty-four students who have demonstrated outstanding academic results gained entry into the demanding three-year Accelerated Pathway BE(Hons) programme.

In addition to taking great satisfaction in the quality and academic performance of our students, the Faculty takes pride in the recent outstanding achievements of its alumni.

Multi-award winning alumnus Dr Mark Sagar won his second consecutive Scientific and Engineering Oscar in February this year. Mark, who has a PhD in Mechanical Engineering from The University of Auckland, has helped bring Spiderman, Benjamin Button and characters in Avatar to life. He was awarded the Oscar for his development of facial motion capture technology which allows him to create realistic animated faces.

Another of our alumni to gain recognition on the international stage is Chris Liddell. The distinguished alumnus has made headlines around the world this year for his role at General Motors (GM) in the United States. The Civil and Environmental Engineering graduate astounded Wall Street when he led GM through a world record \$23 billion initial public offering in November last year, allowing the company to recover from a government-sponsored

bankruptcy. He was named the NZ Herald's Business Leader of the Year in 2010 for his efforts at GM and received a Lifetime Achievement award as part of the 2011 New Zealand CFO awards. Chris has since resigned from GM and we can be assured of seeing more great things from him in the future.

At the start of the 2011 academic year there were changes to the headships in two of the departments in the Faculty. Professor Bruce Melville stood down as the long serving Head of the Department of Civil and Environmental Engineering and Professor Andrew Pullan completed his three year term as Head of the Department of Engineering Science. I am most grateful to both Bruce and Andrew for their unique contributions to their departments and, as members of the Faculty Executive team, to the operation of the Faculty. I am very pleased that Bruce and Andrew have been succeeded by Professor Pierre Quenneville and Professor Matthias Ehr Gott, respectively. Pierre and Matthias have already played important roles within the Faculty of Engineering and will continue to uphold the qualities of leadership that we have enjoyed for many years in our Heads of Department.

Anticipation is building as the Rugby World Cup 2011 looms ever closer and the 2011 Alumni Dinner, on Friday 23 September, falls within the period of the competition. Please note that this year the dinner is on a Friday and not, as has been our custom in the past, the Saturday evening. This is because New Zealand will be playing France on Saturday 24 September and we wish to avoid a diary clash! The annual Alumni Dinner is one of our most popular events and allows alumni spanning more than 50 years to reconnect with each other, Faculty and the University at large. Graduates from all years are welcome but I particularly encourage all of our alumni who graduated in years ending with a one - 1951, 1961, 1971, 1981, 1991 and 2001 - to attend this year. Good company coupled with great food and wine will ensure a most enjoyable evening.

Finally I should like to take this opportunity to congratulate all students from the Faculty who are graduating in 2011. I welcome you to the alumni family and wish you the best in your future endeavours. I look forward to following and taking pride in your careers as you make a positive impact on society, as so many of our alumni have done in the past.

Professor Michael C.R. Davies
Dean of Engineering

Christchurch Earthquake

Researchers investigate the Christchurch earthquake

The University of Auckland engineers believe difficult decisions must be made to improve public safety in the wake of the Christchurch earthquake on 22 February 2011.

Civil and Environmental Engineering Lecturers Professor Michael Pender, Associate Professor Jason Ingham and Associate Professor Charles Clifton and fellow researcher David T. Biggs, a US-based structural engineer, were ironically in Christchurch preparing for a seminar on earthquake building standards when the building began to shake.

The team soon realised this was not a typical aftershock.

"At that point I think most of us don't have clear memories of what happened next. The

adrenaline hits and you sort of run around and try to get out," Associate Professor Ingham says.

Before they began the seminar David Biggs checked the emergency exits at the hotel to find they were locked and he requested hotel staff unlock the doors.

"There would have been 84 of Christchurch's best earthquake engineers in the room. So there were interesting implications if our hotel had not survived, because it would have wiped out much of the structural engineering capabilities in Christchurch," he says.

They escaped without injury and stayed on in the city as part of the official building assessment team investigating structural damage.

"I suppose the one comment I can make is that it was obvious to me that people were going to be dead in this earthquake. The other comment is that I'm surprised the death toll isn't at least ten times what it is," says Associate Professor Ingham.

Others from the Civil and Environmental Engineering Department joined their colleagues in Christchurch to help with building inspections and to carry out earthquake research.

As the teams in Christchurch move from response to recovery they begin to evaluate why so many modern buildings failed and have been damaged beyond repair. They are also faced with the challenge of testing damaged buildings before they are destroyed.

Associate Professor Ingham, David Biggs and a PhD student in Structural Engineering, Lisa Moon, are researching how unreinforced masonry buildings performed in the earthquake.

Their research report entitled "How did unreinforced masonry buildings perform in the February 2011 Christchurch earthquake?" shows the aftershock effects were "four to six times greater than the initial earthquake and generated approximately





to current strength, or demolish these iconic heritage buildings, he says.

“However, there were many successes of seismically retrofitted URM buildings that could be emulated to ensure public safety in these heritage buildings.”

Soil liquefaction caused severe damage throughout the city.

Dr Rolando Orense from the Civil and Environmental Engineering Department says that what has been seen after the aftershock is what is expected in terms of liquefaction.

“The softening of the ground due to liquefaction would have induced more shaking for the structures,” he says.

Associate Professor Clifton says the engineers who surveyed the September quake damage did not anticipate such a big aftershock.

“When we did the assessment in September we were asked to assess on an aftershock basis and then complete an in-depth analysis.”

He says he had “an instinctive sense that everyone could recover from the September earthquake”.

“But this time around the whole concept of bringing the city back is not going to happen in a hurry. There is such a magnitude of damage.”

The researchers anticipate it will take at least three years before the CBD will be functioning.



twice the 500-year design load for new buildings or about three times the loading from the September 2010 quake.

“In that regard, the strengthened buildings were likely exposed to a loading that was six times what they might have been designed for,” Associate Professor Ingham says.

“Recognising the intensity of actual accelerations, failures would be expected and the surviving buildings are actually real success stories.”

The procedure the engineers used was to identify damage by categorising each building as green, yellow or red.

“A judgement was made regarding whether the building was essentially undamaged (green), was damaged but expected to be repairable (yellow) or damaged to the extent that demolition was likely (red).”

By March 4 2011, 3000 buildings had been inspected, with 23% red tagged and 53% green tagged.

Associate Professor Ingham says approximately 50% of unreinforced masonry (URM) buildings were severely damaged; mostly due to the failure of connections.

“Once again it has been demonstrated that

unreinforced masonry buildings collapse in large earthquakes unless they have been suitably strengthened. To maintain public safety, difficult decisions must be made regarding whether to upgrade URM buildings



Faculty News

Professor receives international acclaim

Faculty of Engineering Professor Debes Bhattacharyya has been presented with the prestigious award, the 'Nav Rattan' at a spectacular ceremony in New Delhi, attended by cabinet ministers and intellectuals.

The Nav Rattan (nine jewels) is one of the highest honours given to non-resident Indians. It has been named after a very famous court of an ancient emperor who assembled nine learned people from nine areas of study. The Nav Rattan is one step higher than his previous award the 'Hind Rattan' (jewel of India), which he received last year in New Dehli.

"The award was presented to me to recognise 'the outstanding contribution to the profession and community' made by a non-resident Indian," he says.

Professor Bhattacharyya was delighted to receive one of only nine of the Nav Rattan awards for 2011. He was the only recipient from the Asia-Australasia region. He was also awarded a Gold Medal in September 2010 at the House of Lords, London for his contributions to the profession.



Professor Debes Bhattacharyya

Professor Bhattacharyya was born in Calcutta and attended the University of Calcutta. He began his career at The University of Auckland in 1980 and was Head of Department for Mechanical Engineering from 1999 to early 2005. He is currently the Director of the

Centre for Advanced Composite Materials at Tamaki. He was named a Distinguished Fellow, the highest award of the Institution of Professional Engineers New Zealand (IPENZ), in 2010. He is also a Fellow of the Royal Society New Zealand.

Engineering graduate steps in as Equity Adviser

It was with deep gratitude and fondness that staff bid Robyn Macleod farewell at the end of last year, and wished her well as she takes a leave of absence from the Faculty in 2011.

The announcement was also made that during this period the role of Women in Engineering Equity Adviser is being filled by Imee Tribo, a graduate of the Faculty with a BE(Hons) in Engineering Science.

Imee returns to the Faculty after several successful years in industry, most recently with Orion and we are confident she will carry on the excellent work and progress promoting and supporting women in engineering started by Robyn.

"I'm finding the role to be very rewarding in terms of helping young women at high school level understand the various specialisations, career options, real-world applications and ability to make a difference that engineering has to offer. I enjoy talking to students, parents

and teachers about the creativity, logic and communication skills required to be a professional engineer," Imee says.

"I am constantly learning about new research and applications of engineering just by being in such an encouraging learning environment and the team of people I work with, both in the

Faculty and the Equity Office, have been very supportive."

She says working with the women students has also proved to be very rewarding.

"It has been a positive experience and I'm encouraged by the feedback we've received



Imee Tribo

about the support that's available to them – tutoring, WEN student events, the Part I Assistance Centre and Employment Management, just to name a few. Staff have also been supportive in dealing with the occasional issues with individual students and I think that most students understand that we can help them if they just ask for it," she says.

Imee aims to continue to increase the number of female students in engineering, much like her predecessor Robyn did.

"Part of that involves extending the number of schools I visit to include large co-educational schools as well as schools outside of the Auckland region, she says.

"I also hope to be working with the Faculty of Education as they coordinate professional development for teachers in Auckland. I think this is an excellent channel for us to build relationships with the science and mathematics teachers in the region, who in turn can further encourage their students to consider a career in engineering."

Imee can be contacted on any matter relating to current women students, alumni or potential new recruits.

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Changing of the guard

Professor Matthias Ehrgott, an expert in multicriteria optimisation, is the new Head of Department of Engineering Science.

Professor Matthias Ehrgott, who replaces Professor Andrew Pullan, was appointed to the role in February.

Professor Matthias studied mathematics, economics, and computer science at the University of Kaiserslautern, in southwest Germany, where he obtained his Masters (1992) and PhD degrees (1997).

It was during his term as Assistant Professor of Mathematics at The University of Kaiserslautern he decided to spend a year overseas. That year turned into ten, and this year Matthias was one of 12 Associate Professors at the University promoted to Professor.

Matthias is an authority in operations research who specialises in modelling and solving multiple criteria decision-making problems. Some of his research has been used to lessen the impacts of delays on airline schedules and another project is looking at improving the planning for radiotherapy treatment for cancer. "A private oncology centre in Auckland is interested in a possible collaboration," he says.

Last year Matthias was one of twenty academics from The University of Auckland awarded a prestigious Marsden grant.

The \$585,000 grant is to conduct research to develop new capability in equilibrium models that arise in areas such as transport planning and energy modelling. "Equilibrium models form the foundation upon which many decision-making processes are built, and are therefore crucial to many sectors in New Zealand," he says.

Matthias has published more than 50 journal articles and proceedings papers, written and edited several books and special issues of journals. His book *Multicriteria Optimisation* is a standard reference in the field and used as a textbook around the world.

He is Vice President of the Operations Research Society of New Zealand, which has

around 180 members. In 2002, Matthias was awarded a Wiley Prize for best applied paper in Multiple Criteria Decision Analysis at the International Conference on Multicriteria Decision Making, in Semmering, Austria. More accolades are possible this year as Matthias has been nominated for an award at the same conference which is being held in Finland in June.



Professor Matthias Ehrgott

Faculty News CONTINUED



Industry leader on University Council

Michael Daniell, a Faculty of Engineering graduate and prominent industrialist, has joined The University of Auckland Council.

He has been appointed by the Minister for Tertiary Education for a period of four years.

Mr Daniell is Managing Director and Chief Executive Officer of Fisher & Paykel Healthcare. The company employs more than 2000 people worldwide, including many of The University of Auckland graduates, and is a leading designer, manufacturer and marketer of innovative medical devices. Its products and systems are sold in more than 120

countries, earning revenue of around \$500 million annually.

Mr Daniell received his Bachelor of Engineering degree in Electrical Engineering with honours from the University in 1979.

He joined Fisher & Paykel as a Product Design Engineer. He served as Technical Manager and General Manager before being appointed to his current position in 2001.

In 2009, the New Zealand Herald made him its New Zealander of the Year in Business.

The University's Chancellor, Roger France, says "Mr Daniell's background and experience as the Chief Executive Officer of one of the country's great international high tech success stories, itself a major employer of graduates, will be enormously valuable to Council and the University."

New Head of Department for Civil and Environment Engineering

Professor Pierre Quenneville, a world-leading expert in timber design, is the new Head of Department for Civil and Environmental Engineering.

Professor Quenneville officially took over the reins from Professor Bruce Melville in February.

"I am excited to be working with a supportive, academic team," Professor Quenneville says.

Professor Quenneville was born in Canada, and before embarking on an academic career, was an Officer in the Canadian Armed Forces for nine years. He completed his Master's degree at Montreal Ecole Polytechnique while still serving as a Military Engineer. He left the forces to complete his PhD in Civil Engineering at Queens University, Canada. In 1988 Professor Quenneville joined the Royal Military College of Canada as a Lecturer and during his tenure was promoted to Head of Department.

Professor Quenneville started at The University of Auckland in 2007 as Chair in Timber Design, a newly created position supported by the Ministry of Agriculture and Forestry.

As part of his new role, as Head of Department, he leads the Faculty of

Engineering's timber research group, which through research and innovation is aiming to increase the use of wood in non-residential buildings, help expand New Zealand's timber industry and grow the export market.

Professor Quenneville's passion for timber came from his father.

"Most people who are working in timber have relatives with timber backgrounds. In my case it was my father who started as a carpenter and became a teacher in carpentry."

Using his inherited skills he built his own house in Canada and makes his own furniture when time permits.

Four years ago, Professor Quenneville received the Wood Advocate/Wood Champion award from the Canadian Wood Council for advancing wood engineering, education and research.

Professor Quenneville has been conducting research on timber connections for nearly two decades. He is well-known in the industry for campaigning for the use of timber in more construction projects and his research into efficient bolted connections has helped set international building standards.

In 2008 a consortium made up of The University of Auckland, the University of Canterbury and the University of Technology Sydney was successful in obtaining

an industry/Government grant of \$10 million over five years for timber research to advance the use of timber in construction. Professor Quenneville spearheads the University's research programme which concentrates on research on large-span timber roofs and timber connections.





Professor Xun Xu

Professor Xu debates with China's political elite

The Faculty of Engineering's Professor Xun Xu was one of a select few expat-Chinese recently invited to one of the most important gatherings on China's political calendar.

In March Dr Xu spent 12 days in Beijing, as a non-voting delegate, at the Chinese People's Political Consultative Conference (CPPCC) and National People's Congress (NPC) Annual General Meeting (AGM).

"It's a huge honour to be a member of either political body in China, so I felt extremely honoured to be there," says Dr Xu.

During sessions more than 2000 domestic delegates and 38 Chinese-expats from across the world, debated and discussed a raft of topics including the direction of China's 12th Five-year Plan, which sets the country's strategic direction until 2015.

Expat-Chinese are invited to the conference by the Chinese Government to help with, and give advice on China's development.

"It's about how overseas Chinese can help China further develop in a sustainable manner and it also provides opportunities for overseas

Chinese to make contributions to the country's economy," he says.

Dr Xu says this year's AGM was significant as it marked the beginning of the next Five-year Plan for China.

The conference received world-wide attention for the setting of a 7 percent GDP growth target in the Five-year Plan, which is about 3 percent less than the country's current growth rate.

"The Chinese economy has been rapidly expanding and providing a positive and stabilising effect on the global economy, but concerns have also been expressed by some experts that a growth rate of over 10 percent is not sustainable, and therefore there is need to 'cool' it down," he says.

The conference is held in the Great Hall of the People, Beijing's political hub, located on the western edge of Tiananmen Square. Some of the most important discussions during the conference take place in the Great Auditorium, which seats more than 10,000.

"We mixed and mingled with the domestic members. It was overwhelming," says Dr Xu.

"I thoroughly enjoyed the opportunity to debate and advise on government policy and its economic plan alongside some of the most prominent economists and politicians," he says.

As a world-leading figure in intelligent and interoperable manufacturing, Dr Xu offered advice on how China may maintain the status of "world manufacturing centre" with a focus on green and sustainable manufacturing.

Dr Xu was chosen by the Chinese Government as the sole New Zealand representative.

Dr Xu, from the Department of Mechanical Engineering, is well-known in the Chinese community, through his work at The University of Auckland and for his research collaborations with a number of Chinese universities and research institutes.

He is also the President of the New Zealand Chinese Scientists Association.

The past year has been a major one for Dr Xu. He was elected a Fellow of the American Society of Mechanical Engineers (ASME), making him the only second ASME Fellow in New Zealand.

In February he was one of 13 Associate professors at The University of Auckland promoted to Professor.

"I started as a lecturer when I first joined the department. I feel extremely lucky to be working at this elite university and thankful to my colleagues who have really 'made me feel at home' in this beautiful country," says Dr Xu.

Research

Team of researchers take technology to Chicago

World-first technology developed at The University of Auckland could help doctors better diagnose stomach conditions.

By recording the stomach's electrical activity, Professor Andrew Pullan and a team of researchers from The University of Auckland are paving the way to the development of new

and improved methods to diagnose a variety of stomach-related illnesses. This could ultimately lead to the development of pacemaker-type devices that aids in-stomach performance, in much the same way as is currently done for the heart.

The team will be showcasing their investigation into the stomach's electro activity at the upcoming Digestive Diseases Week conference in Chicago.

The conference will be held from 7-10 May and attracts 15,000 people. The team submitted

seven abstracts last year to the conference and all were accepted. Overall, the team will give two oral presentations, show two posters of distinction, and three abstracts were accepted for posters.

Professor Pullan says the opportunity to present at the conference is "a big deal".

"To get a talk is pretty difficult at this conference, so for my team to get two is great," he says.

When the team return from Chicago they will be heading to the Mayo Clinic to "try out some new ideas and methods for recording the electrical activity of the stomach." Professor Pullan and his team have designed a new device for such recordings and a medical device company near Mayo are building a prototype of it.

Professor Pullan says the new device will be much less invasive in measuring the stomach's electrical activity. The existing methods used for measuring electrical activity of the stomach require access to the stomach through the chest wall, so cannot be used routinely. With the new device, access to the stomach will be down the throat.

"It is a difficult process to measure electrical activity of the stomach from the inside as the stomach is insulated with mucus layers so it is not straight forward. But we believe we can do it with our device," he says.

They use the information from the recordings to make mathematical models of normal and abnormal activity in the stomach.

"There is simply no one in the world who is recording, analysing and building the detailed models of the stomach that we are doing," he says.

He says the project is unique because the team working on creating the device is an interesting mix of experts from medicine and engineering.

The team have received seed funding from UniServices to turn the device into a commercially viable project. They need to secure more funds to conduct a larger series of patient trials.

"There is still a lot of work to be done, but it is the tip of the iceberg. There is nothing out there like this. It could easily move in the same direction as the heart pacemaker and defibrillator has in monitoring and controlling the heart," he says.

"In doing this we believe we can improve the lives of many patients."



Professor Andrew Pullan

Technology developed at The University of Auckland used to charge luxury cars wirelessly

Pioneering technology, developed by The University of Auckland's Power Electronics Group, has been integrated into Rolls-Royce Motor Cars test vehicle.

It is the world's first wireless technology that allows parked or moving cars fitted with a receiver pad, to charge automatically when parked over transmitter pads buried into the ground.

The Power Electronics Group is led by Professor John Boys and Associate Professor Grant Covic from the Department of Electrical and Computer Engineering.

The breakthrough technology is owned by UK-based HaloIPT, which was founded by Auckland UniServices.

Dr Covic says it is very satisfying and motivating for himself and Dr Boys to see their research ideas being used and proven.

"What is pleasing is that it is well known that Rolls-Royce does not put anything on their cars that is not up to very strict standards. The fact that we can work with them, and they are very happy with the end result, speaks volumes for the robustness and quality of our technology and the systems HaloIPT is producing," he says.

HaloIPT says it is the first in the world to bring IPT (Inductive Power Transfer) technology to the market. The theory is that an electrical current produces a magnetic field and that a coil



placed in this field will generate voltage. The technology is designed to function beneath asphalt and even works under water or covered in ice and snow. The technology will be used for the Phantom Experimental Electric Rolls-Royce vehicle.

Dr Anthony Thomson, CEO of HaloIPT, says: "We are delighted to provide our wireless charging technology for this trial. Industry feedback so far tells us that the automation advantages of wireless charging make it the best charging solution for luxury electric vehicles and will be the key to unlocking the potential of this exciting market. Users don't need to get out of their vehicles and hunt for a cable to plug-in; they will just park and walk away while their car starts charging automatically; the ultimate in modern convenience."

IPT technology was invented in the basement of the Faculty of Engineering at

The University of Auckland more than 20 years ago led by Dr Boys.

The group is pleased to see the technology making it on to the international stage.

"We have a dream for a transportation system for New Zealand and the rest of the world. Cars will be equipped with pads and as the car moves along the road way it will pick up power to charge up the battery. The cars will be cheaper, lighter and more efficient and completely green," says Dr Boys.

IPT systems can be configured to power all road-based vehicles from small city cars to heavy-goods vehicles and buses.

Auckland UniServices Ltd Chief Executive Peter Lee says the wireless charging technology, which is set to revolutionise the electric vehicle market, has major benefits for New Zealand.

"The project we have underway has the ability to radically improve our quality of life in the area of health and low carbon transport."

Dr Covic says the group has many more ideas in this area that they are continually working on.

"We are focusing on creating systems which allow electronic vehicles to be charged and powered while moving (not only when stationary), and alongside this, will use green sources such as wind as the major source of energy," he says.

"All of these ideas combined have the potential to effect major changes in the design of future cities which is exciting, but need an uptake in electronic vehicles and acceptance of inductive charging as an appropriate way to do it for this to happen. The Rolls-Royce demo is a start."



1 POWER SUPPLY 2 TRANSMITTER PAD 3 WIRELESS ELECTRICITY & DATA TRANSFER
4 RECEIVER PAD 5 SYSTEM CONTROLLER 6 BATTERY

Research CONTINUED



Fletcher Construction sponsors Masters in Construction Management

Fletcher Construction has generously sponsored the Faculty of Engineering's Master in Engineering Studies (Construction Management), which responds to the large growth in the construction industry and the increasing complexity of construction projects.

The programme equips engineers with the management approaches necessary to assume leadership roles; such as project manager in the construction industry.

Fletcher has contributed \$150,000 to the programme. Programme Leader Garry Miller says the programme responds to calls from leading organisations such as Fletcher Construction, to support the development of professional managers by supplementing an

engineer's technical problem solving skills with modern construction management knowledge and know-how.

"The role of the professional manager in the construction industry is a challenging one, requiring skilful engineers with a command of technical problem solving skills coupled with robust management approaches, and 'softer' people leadership skills," he says.

Garry says industry has responded positively: "We have an industry advisory body with representatives from some of the leading consulting engineers and contractors in New Zealand. They provide us with feedback on industry perceptions which are very positive. The programme attracts people from New Zealand and internationally. Many of the domestic students are sponsored by their employers to undertake the programme, which demonstrates the value they place in the programme and in the training of their staff," he says.

The Master in Engineering Studies (Construction Management) is a one year

full-time specialised taught programme at postgraduate level. The programme can also be completed part-time in two to four years.

Garry says "approximately half of the students have been sponsored by their employers and are working part-time. There is between 20-30 students currently in the programme".

"Typically people attracted to the programme have worked for a few years in the construction environment, and are looking to acquire new skills for the next career step. Others are seeking to change the direction of their career," he says.

The programme comprises of courses ranging from project management, cost engineering and risk management for engineers to logistics and contracts. One of the optional papers, called Work Based Learning, is aligned to the IPENZ professional competencies and this helps students prepare towards CPEng.

"The programme is not aimed at any particular sub-sector of the industry and is relevant to people in sectors from infrastructure, engineering and building. It is equally relevant for individuals working for constructors, owners and professional service providers," he says.

There are two enrolments each year at The University of Auckland, with semesters starting in March and July.

If you are interested in getting more information about how the MEngSt Construction Management can be tailored to your professional career development, contact:

Garry Miller
Phone: 09 373 7599 ext 88558
Email: g.miller@auckland.ac.nz

New Master of Engineering Studies specialisation

The University of Auckland is responding to rapid growth in the global medical devices industry with a new Master of Engineering Studies in Medical Devices and Technologies programme.

The Master of Engineering Studies in Medical Devices and Technologies is aimed primarily at engineers and health professionals to provide them with the necessary broad range of knowledge in the various technologies underpinning medical devices. It will also provide essential skills in medical practices, regulatory

processes, and product development and innovation.

The degree commenced in the first semester of 2011 with 18 students attending the first course.

Business Development Manager in Medical Devices, David Cotter says Fisher & Paykel Healthcare is the largest provider of candidates with eight students.

"There is a significant amount of project work in the degree and, wherever possible, we are having the students undertake projects on behalf of their companies. This maximises the value for both company and individual," he says.

Graduates of the programme will be equipped with the technical, medical, ethical, regulatory

and business knowledge required for innovation in medical devices and technologies, filling the large demand for these skills in the global and domestic medical devices industry.

"Overall, we are most pleased with the way this new degree has started out and with the high levels of co-operation and help we have received from the local industry."



Engineering Students

Engineer makes Black Sticks squad

Marcus Child has been named in the initial Black Sticks squad for the Sultan Azlan Shah Cup Invitational Tournament in Malaysia during May this year.

The Chemical and Materials Engineering student at The University of Auckland says he had been “on the fringe of the NZ team for a little while”.

“I managed to be named in a series over summer against Korea and Belgium and had played quite well so I was hoping to be named in the team for Azlan Shah. When I was named in the team, I was very excited and then a little bit worried once I found out that we would be playing some of the top teams in the world including Aussie who are number one at the moment,” he says.

He hopes to gain a regular place in the team with the London Olympics approaching.

“I want to have the best shot at making that team as I can. I’ve always dreamed of competing in the Olympics and after I was named in the NZ squad at the end of last year I thought I may as well give it a go to make the Olympic team.”

His debut came in 2010 after he was named to play in the Four Nations Tournament as a replacement for his brother and teammate Simon Child, who had suffered a pelvis stress fracture. His first game was against Japan in Nottingham.

Marcus, who plays midfield, had played in the U21 squad in the Junior World Cup in 2009 and had begun training with the Black Sticks men just months before the announcement. His interest in hockey began at age four.

Marcus completed his first two years of the BE(Hons), but now he has started studying part-time to allow him to play hockey full-time. He says the downside is that it is going to take four years of part-time study to complete his degree.



Azlan Shah will give the 20-year-old an opportunity to play against a range of top teams including those from Great Britain, Australia, India, Korea, Pakistan and Malaysia.

Engineer’s record breaking win

Defending champion Mark Bowstead notched up his second Auckland half ironman win this year.

The Chemical and Materials Engineering student became the first person to win the title two years in a row.

The race included a 2km swim, 90km bike and a 21km run.

Mark says he was happy with his run and had an overall time of four hours and nine minutes, which was the same as the previous year.

“At least I am consistent,” he says.

Mark had been disappointed with his performance at the New Plymouth ironman just weeks earlier.

“So I was extremely motivated to put together some good training and redeem myself.”

He says he found it difficult to balance his university life with his rigid training regime.

“One week out of the race I was feeling the effects of studying and training. It was knocking me out physically and mentally.”

After taking some time out he was back in excellent form.

Race day came without a cloud in the sky.

“The hooter went and everyone was off. I had an amazing start and really put the hammer down from the go, as I wanted to make sure no one got on my feet.”

Mark’s family attended the race as his support crew.

“At the top of the hill I had a funny surprise from my younger brother. He decided to do a Tour de France style undie run next to me.”

But it wasn’t all fun and games for Mark. Just when he thought he had a clear run ahead of him he hit a bump on the bridge.

“My full electrolyte bottle came out of my cage. For a split second I thought about stopping and picking it up but I still had half a bottle of water which I hoped was enough to get me to 60km, he says.

“Most of the coast road was fast but for the last 5km there was a solid head wind. I was very relieved to see the aid station and pick up a Leppin electrolyte and water to get my fluids back up.”

He says coming up to the finish line felt fantastic, as he had achieved his goal.

“It was a great feeling to be able to defend my title, and from the start to finish again.”

Now that the race is complete Mark is focusing on his studies.

“It’s time for a proper break and to turn my full attention to my degree so that I can graduate, and next year travel the world and do what I love – race triathlons.”



Engineering Students CONTINUED

2011 Microsoft Imagine Cup winners take on malaria

Last year a group of engineering students made New Zealand history, placing third at the world finals of the 2010 Microsoft Imagine Cup for their project to improve access to education in third world countries. This year the team will have the opportunity to fight for first place, with software which is set to revolutionise the fight against malaria, after winning the New Zealand finals for the 2011 Microsoft Imagine Cup for the second year in a row.

Team OneBeep, made up of Steve Ward, Kayo Lakodia, Chanyeol Yoo and Vinny Kumar, have changed their name and project in a bid to take out the top spot in the world finals at the 2011 Microsoft Imagine Cup held in America. This year the team includes Kayo Lakodia, Steven Kang, Edward Peek and Vinny Kumar and they are called Team OneBuzz. Team OneBuzz are building a platform to help predict where a malaria epidemic can strike before it actually happens.

Team OneBuzz were awarded \$500 and will now compete in an online qualifying round for a chance to represent New Zealand at the worldwide finals in New York in July 2011. The prize for the competition in New York is \$12,000.

Vinny says "it was an amazing feeling to win. The two new members (Steven Kang and Edward Peek) felt it even more as this was my second time to win the award. It felt great because we could show people that last year's win wasn't a fluke and that we are full of good ideas.

"It took months of sweat and tears to get to this point and the whole process from generating the original idea, through to seeing the project become a reality has been absolutely incredible," says Vinny.

Within a month the team will submit a video of their concept which will account

for a high percentage of their score in the global competition.

The Microsoft Imagine Cup is the world's largest student technology competition, challenging students with engineering, software or technical backgrounds to develop solutions to the world's toughest problems.

Vinny says the team "came close to winning the 2010 Imagine Cup".

"We have learned from the mistakes we made and have tried to eliminate them. Also the feedback we received on a global level helped us improve and evolve the OneBuzz project to what it takes to win."

This is a personal project for Vinny, as he has suffered from malaria and has seen the suffering first hand.

The idea was one of several that the team had. Their focus was on using technology to assist those living in the developing world.

"We saw that malaria is a huge problem - one to three million people die every year and a further 300 million are rendered unable to perform their daily jobs. We researched current initiatives, which are heading in the right direction but fell short. So we proposed a combination of these, along with our system to build a robust platform to encourage local and global partnerships to better coordinate on ground efforts and save lives."

Kayo says through OneBuzz's extensive research on anti-malaria initiatives, the team developed algorithms to help them track a malaria outbreak.

"We are using these to develop a platform which integrates information from a multitude of different sources, overlaying this information on a map to visualise the extent of malaria thus allowing better planning of resources."

He says "one of the sources is satellite images. These are used to help pinpoint pockets of water which could potentially be a breeding ground for mosquitos."

Another source the team will be using is mobile phones. These will provide doctors and nursing staff in remote regions with access to SMS information such as malaria cases and medicine stock.

He says the team will also look into the history of malaria in order to identify areas which are more at risk and prioritise them.

"By aggregating information from these sources, the software can help the Health Ministries make better decisions on resource allocation, track the progress of various anti-malaria interventions, and thus stop a potential malaria epidemic from breaking out."

Vinny says the project does overlap with aspects of the Team OneBeep project.

"Our principle has remained similar between the projects in the sense that we are using developed world technologies, collating and adapting them for use in the developing world. There are overlapping areas where data on malaria needs to be taken out of regions without Internet capabilities or data be sent to them," he says.

Vinny says the focus of the project is "not to just kill mosquitos, it is to not even let them be born in first place".

"Our solution digitizes the process of the fight against malaria. This takes the fight against it to a whole new level."

Team OneBuzz are drawing on the knowledge of their academic mentor, Nick Douglas, who is a Rhodes Scholar to Oxford from New Zealand, and is finishing his PhD on malaria and its spread.

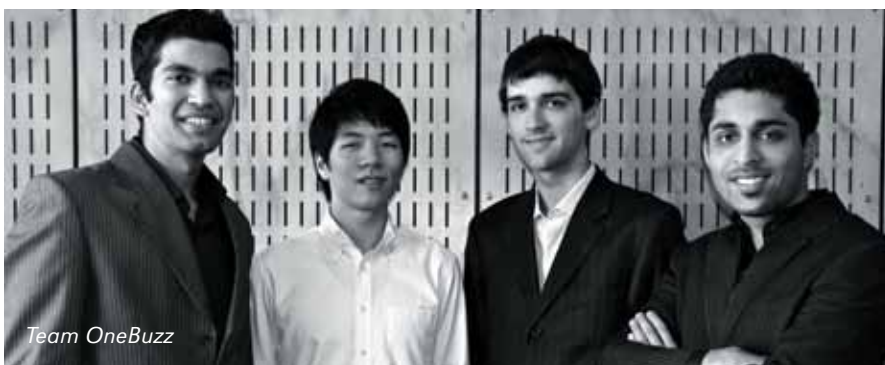
New Zealander of the Year in 2010, Ray Avery, who established Medicine Mondiale, an independent development agency and charity, is a research partner and is collaborating with the team on their project.

Team OneBuzz is working on a self-sustainable business model which is very low cost, and are focusing on taking their project to Africa, South America, India and the South Pacific, where malaria is common.

The team has established a relationship with the National Institute of Malaria Research in India and the Rotary Foundation in order to implement their project.

Team OneBuzz's objective is to get the product launched within a year.

"The Imagine Cup is just a start for us, it is not the end."



Team OneBuzz

Engineers place second with lasers used to fight malaria

A team of engineering students who designed inexpensive lasers to zap mosquitoes mid-flight in a bid to tackle the scourge of malaria have placed second in the Microsoft Imagine Cup 2011.

Team MCG Electrical and Computer engineering students Jonny Lin, Ceya Rao, Bharvesh Lal Maisuria and Tyson Scott Cabral, pushed aside mosquito nets and are targeting mosquitoes, which are well known for spreading the deadly malaria virus, using a laser defence system.

The Microsoft Imagine Cup is a competition where teams of students use technology to solve the world's problems. The finals were held at the University's Business School on 12 April.

Team leader Jonny came up with the idea on a bus ride home. Initially he thought of a helicopter that attracts and kills mosquitoes. The team took the idea further by designing a similar device on an intelligent fence system.

The team has developed an invisible shield between two posts which have modules attached that contain a camera and a laser. Insects which fly through the fence area are detected by casting a shadow on the camera. The insect is then tracked and a tracing beam moves towards the insect. The team then measures the wind



frequency of the insect to see if the flying insect is a mosquito. Once they determine the mosquito is a female, as only the females can bite and therefore spread malaria, the laser will lock onto and kill the airborne mosquito.

Ceya says the device will benefit society and will stop millions of deaths from malaria each year.

"Pregnant women and children are most at risk of malaria, so they will benefit greatly from our product. Our system is designed to protect perimeters of homes, clinics, orchards and hospitals. Anywhere that has human inhabitants and where malaria is rampant."

Ceya says the product is cost effective as the price of the fence is under \$50 per unit.

"In a densely populated area, it is cheaper to implement our system than to supply each household with a mosquito net," she says.

However, there may be concerns about the risks to animals and the general public as the intensity of the laser is just under what is

classified as industrial.

"We have safe-proofed the system with both the software and hardware mechanisms, so the lasers don't target humans or other animals, only the malaria carrying mosquito."

Team MCG have worked tirelessly on the project.

"It's not something that can easily be developed in three months. There is a lot of self-learning in terms of the technical details in the software/hardware implementation. There are quite a few components that we had to individually obtain and pay for," she says.

But this has not dismayed the team who believe their system, which combines hardware and software mechanisms, is a worthwhile development.

"We believe that our project is going to really impact people's lives, directly."

Tyson says, "the Imagine Cup may be over but this is just the beginning for us."

Victoria Tunnel visit entertains engineering exchange students

A field trip to the Victoria Tunnel site in Auckland gave Korean engineering summer school students a first-hand view of the first tunnel to be constructed in Auckland.

Thirty students from Kyung-Hee University in Seoul were on a summer school exchange studying at The University of Auckland. In addition to improving their English language skills, and getting a taste of New Zealand culture, the students were in Auckland to study project management, risk management and engineering economics.

The students, all from different branches of engineering, including civil engineering, mechanical engineering and even nuclear engineering, had the opportunity to go down the Victoria tunnel and see for themselves the

management of a complex engineering project.

Darron Monaghan, Engineering Manager with Fletcher Construction Engineering, gave the students practical lessons on risk management, project management and leadership.

Course coordinator Associate Professor Suzanne Wilkinson, says "this is the first time many of these Korean students have been on a large construction site".

"My understanding is that in Korea almost all of the teaching is classroom based. By visiting such a large and interesting construction project, the students are able to benefit from understanding how theory and practice overlap. We are very grateful that Fletcher Construction was able to accommodate these students," she says.

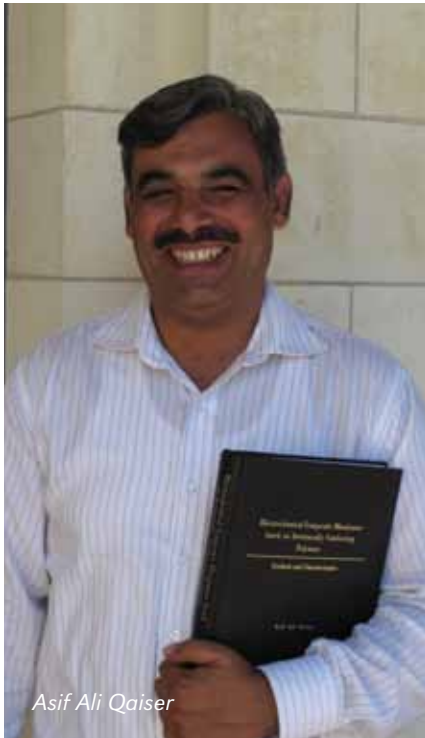
The Victoria Park Tunnel project is the last phase in the Central Motorway Junction improvements programme, which aims to improve traffic flow through Auckland's central motorway.

The NZ\$406m project, which is expected to be completed by 2012, will see a 440m long



three-lane northbound tunnel constructed underneath Victoria Park. The Victoria Park Alliance will also convert the existing viaduct to four southbound lanes and create additional lanes through St Mary's Bay. The Victoria Park Alliance includes Fletcher Construction, the NZTA, Beca Infrastructure, Higgins and Parsons Brinkerhoff.

Scholarships



First HEC Scholarship winner to graduate

The first Pakistan Higher Education Commission (HEC) scholarship recipient, Asif Ali Qaiser, will graduate in May this year.

Asif, from the Department of Chemical and Materials Engineering, has successfully completed all the requirements for his PhD. He submitted the final version of his thesis to the Graduate Centre in late February.

"I feel great being the first HEC scholar who is going to graduate from The University of Auckland. It's a great honour and achievement for me. I am thankful to The University of Auckland and in particular to my main supervisor, Associate Professor Margaret Hyland for all the support that I had during my PhD study," Asif says.

"It has been a wonderful experience to be a PhD student at The University of Auckland, and my family and I enjoyed staying in

Auckland. I am also thankful to my funding agency, Higher Education Commission of Pakistan, for their financial support during my study period."

The University of Auckland entered into an agreement with the Pakistan HEC in 2006. This agreement was designed to foster cooperation between the two institutions, and to enable groups of selected candidates from universities, colleges and research and development organisations in Pakistan to undertake postgraduate studies at the University.

"I am working on establishing my research area (Electronic Polymers and Membranes) at my host Department of Polymer and Process Engineering. I will try to disseminate the knowledge which I gained during my PhD research to my students at the University and transfer my skills to the industry for the prosperity of my country."

At present, there are over 70 HEC scholars studying at the University with the vast majority of them engaged in Doctoral level research.

Budding engineers awarded Kick Start Scholarships

Outstanding school-leavers studying engineering were congratulated by The Faculty of Engineering for their success at the annual Kick Start scholarship prize-giving.

Twenty-five students were awarded the Kick Start scholarships, each worth \$2,000 and aimed at assisting first year students with set-up costs for their first year at The University of Auckland.

Several students are moving to Auckland this year to study engineering. Among them are Timothy Prestage, Oscar Dowson, Thomas Baddeley, Enakshi Chakravorty, Ho Yeung Chin, Alex Guy Kendall, Sibylle Van Hove, Matthew Pearce, Shumeng Susan Sun and Carey May Lintott, who are the winners of the Kick Start City of Sails scholarships. The awards are for students who live outside of Auckland, and it is based on an applicant's academic results along with their personal achievements.

Carey Lintott has left her home on a farm in Tauranga to take on the big city and complete a conjoint degree at The University of Auckland.

Carey hopes to become a civil or environmental engineer and would like

to be involved in Engineers without Borders while studying.

"Engineering takes the things I'm strongest at and lets me apply those into a much broader field where I can use many other skills and thought processes, she says.

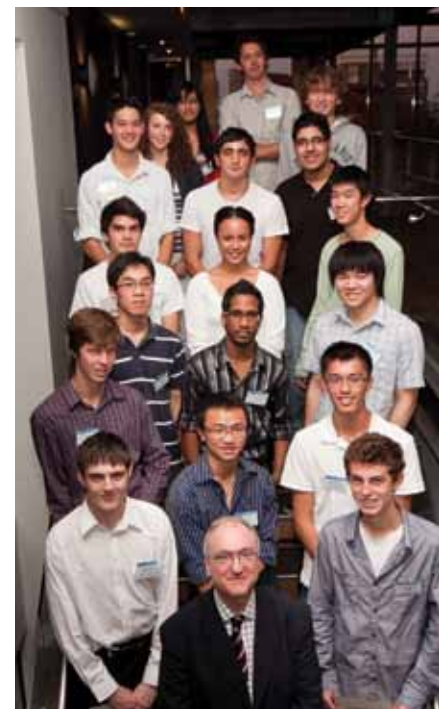
"I'm a kayaker and would especially like to get involved in looking at areas such as water dynamics and sustaining our natural environment."

The active teen is a talented white water kayaker, winning 13 medals last year and is competing in Canada this year as part of the New Zealand under-23 canoe team. She is also a coach and mentor to young kayakers.

All round outstanding students Alex Shegay, Yuen Ho Wong and Anna Mulligan were awarded the Edward Connelly Kick Start scholarship, which was established in 2008 in memory of the late Edward Connelly, a former employee for the Faculty of Engineering, who made a significant bequest of his estate to the Faculty.

Alex says he became interested in the field of engineering because he likes "the idea of being able to make a physical contribution to society".

James Matiu Bronson Burley, Benjamin Tatarihau Urbanc, Ashe Cooper and Viola Edwards took out the Kick Start Affirmative Action scholarships for 2011. The awards are open to top academic students of Māori or Pacific Island heritage who have demonstrated a drive to make a difference.



James says he wants "to find a way to use my engineering degree to benefit the Maori culture and people".

Viola is following in the footsteps of her older brother who is an electrical engineer. She says engineering fascinates her and is something she feels truly passionate about.

She says the scholarship will help her cover textbook costs and travel expenses. She is aiming to work hard so that she can use her

skills to “help others in the community”.

Hamish Chan, Pranav Chandnani, Prineth Leonard Fernando, Harrison Dexter Harcourt Loos, Oliver McMillan, Matthew James Victor Milner, William Quach and David Yan were awarded the Kick Start Merit scholarship for their outstanding academic results in 2010 and their contribution to society.

Pranav says he is interested in studying in the Department of Electrical and Computer Engineering because he loves gadgets and computers.

“I have always had a keen interest in how things work, and I love to take things apart and put them back together. Engineering has always stood out to me

as a field which employs innovative and imaginative thinking. My passion for maths and science has helped me in choosing my career path,” he says.

The Faculty of Engineering is committed to removing financial barriers for potential students and wishes the Kick Start scholarship winners all the best for their future studies.

Auckland student wins Claude McCarthy Fellowship

Doctoral student, Matthew Barrett has been awarded a 2011 Claude McCarthy Fellowship.

Matthew, who is completing a PhD at the Auckland Bioengineering Institute, has won a \$5,000 scholarship to attend a conference in Barcelona, Spain.

The conference is the XXVth International Symposium on Cerebral Blood Flow, Metabolism and Function to be held on 24-28 May next year.

He was one of 23 University students and staff awarded a combined \$93,000 to help advance their research.

“I’m very grateful to have the opportunity to attend this conference,” says Matthew.

“It will allow me to present my work to leading researchers in the field, and exchange ideas with scientists from around the world.”

Matthew completed a BE (Hons) in Biomedical Engineering in 2008. His research is focused on developing mathematical models to better understand the relationship between brain activity and the functional Magnetic Resonance Imaging (fMRI) signal.

fMRI is a specialised scan which allows clinicians and researchers to obtain images of brain activity. The technique is safe, rapid and non-invasive. Exactly how the images

relate to what is happening in the brain remains poorly understood.

Matthew hopes his research will help in interpreting fMRI images and improve our understanding of how the brain functions both in health and disease. He is supervised by Dr Vinod Suresh and Associate Professor Merryri Tawhai.

The Fellowship, funded by income from a bequest by the late Claude McCarthy, enables New Zealand graduates to undertake “original work or research in literature, science or medicine.”

The Claude McCarthy Fellowship was established following Mr McCarthy’s death in 1978. The Trust is managed by Public Trust with the Fellowship selection carried out by the Universities New Zealand.



Scholarships CONTINUED

Professor awarded Marie Curie Fellowship

Professor Mohammed Farid from the Department of Chemical and Materials Engineering has received the prestigious Marie Curie Fellowship.

The fellowship will allow him to conduct research for one year aiming to transfer Phase Change Materials Technology to one of the major European research centres at the University of Lieda in Spain.

"I was very pleased when I received the Marie Curie Fellowship. It has given me a great opportunity to collaborate with European colleagues working in the area of energy storage," Professor Farid says.

Professor Farid, who is supervising four PhD students, says he has built strong ties with several European researchers in Spain.

"My research has impacted the research group in Spain significantly, to the level that I am certain that the research will continue in the coming years, hopefully with some funding from EU."

Professor Farid, who began his career at The University of Auckland in 1997, has a PhD and MSc in Chemical Engineering from the



Professor Mohammed Farid

University of Swansea, Wales and obtained a BSc in Chemical Engineering from the University of Baghdad.

He founded the Department of Chemical Engineering at the University of Basrah in 1983. After achieving this, he worked as a professor at the Jordan University of Science and Technology, as well as at the University of Science, Malaysia.

He is a Fellow of the Institution of Chemical Engineers, London and an active member of a number of international societies.

Professor Farid is regarded as a leader in energy storage with phase change and has significantly contributed to the field worldwide. His research expertise covers many other important areas such as innovative food processing, biofuel and waste management.

Congratulations to new James Cook Research Fellow

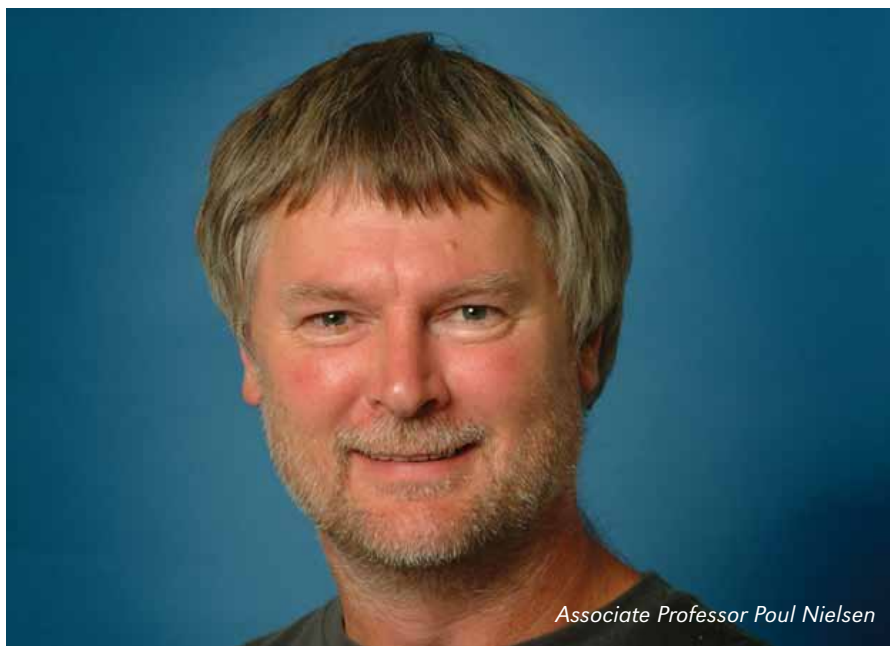
Associate Professor Poul Nielsen from the Department of Engineering Science has received a James Cook Research Fellowship in Engineering Sciences and Technologies for 2011-2012.

The award covers full salary for two years and will allow Professor Nielsen to concentrate on his research. James Cook Fellowships are administered by the Royal Society of New Zealand on behalf of the Government and are widely regarded as New Zealand's most prestigious Science and Technology awards.

Only six James Cook Research Fellowships have ever been awarded in the area of Engineering Sciences and Technologies, four of them to Department of Engineering Science staff; Associate Professor Poul Nielsen, Associate Professor Martyn Nash (2009), Professor Andrew Pullan (2004), and

Professor Peter Hunter (now Director of the Auckland Bioengineering Institute) in 1999. The other two recipients were Professor

Wei Gao from the Department of Chemical and Materials Engineering and Professor Jos Arrillaga from the University of Canterbury.



Associate Professor Poul Nielsen

Alumni

Alumnus working with Boeing

A Faculty of Engineering Alumnus has become a key member in an international research project involving Boeing.

Dr. Fiona Zhao is a full-time guest researcher at one of the top research institutes in the US, the National Institute of Standards and Technology (NIST), in the intelligent systems division. Zhao has been working at NSIT since February this year.

Zhao's research centers on providing solutions for industry in achieving an intelligent and interoperable manufacturing environment.

Zhao, who has a PhD in Mechanical Engineering from The University of Auckland, is currently working on two projects with NIST: the STEP-Manufacturing project and the Quality Information Framework project.

"Both are pilot projects aiming to help industry develop suitable standards to improve industry

information exchange efficiency and save unnecessary data translation cost," she says.

The STEP-Manufacturing Project is carried out in collaboration with industry members such as Boeing, Sandvik and academics from Europe, America and New Zealand.

"Our work has developed certain technologies that can be deployed at Boeing. However, it depends on Boeing to decide how widely it will be used.

"Once the implementations are sophisticated at machine tool level, the process planning sector at Boeing is able to use the STEP-NC (with new development) data model to pass on their manufacturing process information to different manufacturing sites (which use these machine tools to manufacture airplane parts).

"We have two to three demonstrations every year at manufacturing sites of Boeing or other manufacturers. In last year's demonstration, my research was partially incorporated in the demonstration and tested."

The Quality Information Framework Project began in 2010.

"We are hoping to establish a standard data model library for the dimensional metrology industry in the North America."

"We have successfully had an initial pilot demonstration at the 2010 International Manufacturing Technology Show in Chicago with major metrology industry's participation."

Also to be presented is the recently commenced Dimensional Metrology Enterprise Technology Initiative (DMETI) project, the goal of which is to develop a neutral data format for information exchange within dimensional metrology systems for the North America Metrology Society.

Zhao was incredibly successful at The University of Auckland and was awarded the AUEA Braithwaite-Thompson Graduate Research Award, The University of Auckland Faculty of Engineering International Doctoral/Fees scholarship, New Zealand Postgraduate Study Abroad Award and The University of Auckland Doctoral Completion Award.



Dr Fiona Zhao

Alumni CONTINUED

Graduates jet to America

Two Chemical and Materials Engineering graduates have been offered the opportunity to pursue postgraduate study at top institutions in America.

Geran Zhang has chosen to study at Massachusetts Institute of Technology (MIT). He was selected for one of only ten Fulbright Ministry of Research, Science and Technology Graduate Awards available across New Zealand, but he declined as his programme will be fully funded by MIT.

Geran says he chose to study a PhD in Materials Science and Engineering at MIT because the "programme is reputable, there is full funding, there is research I am interested in and it has the top ranked Materials Science and Engineering programme in the States."

His research will be on the self-assembly of block copolymers.

"I hope to complete high-quality research, put out good publications, and learn something in the process. In the long run, I'm hoping what I

learn at MIT can help set me up for a career in academia," he says.

The programme commences in September, but Geran hopes to start his research in June.

Another graduate who will be jetting to America is Ivan Ravlich.

Ivan has received offers to complete postgraduate study at MIT, Caltech and Stanford. He has decided to go to Stanford and will begin studying in September. His research will be in Aerospace Engineering. He aims to complete his masters in one year and then he will work towards attaining a PhD.

"With the choices that were presented to me, the decision [of university] was an extremely difficult one to make. The project and the professor are what initially attracted me to Stanford. Ever since I was a child, I was interested in space and over the last couple years I decided that it was time to pursue a career that utilised my first love," he says.

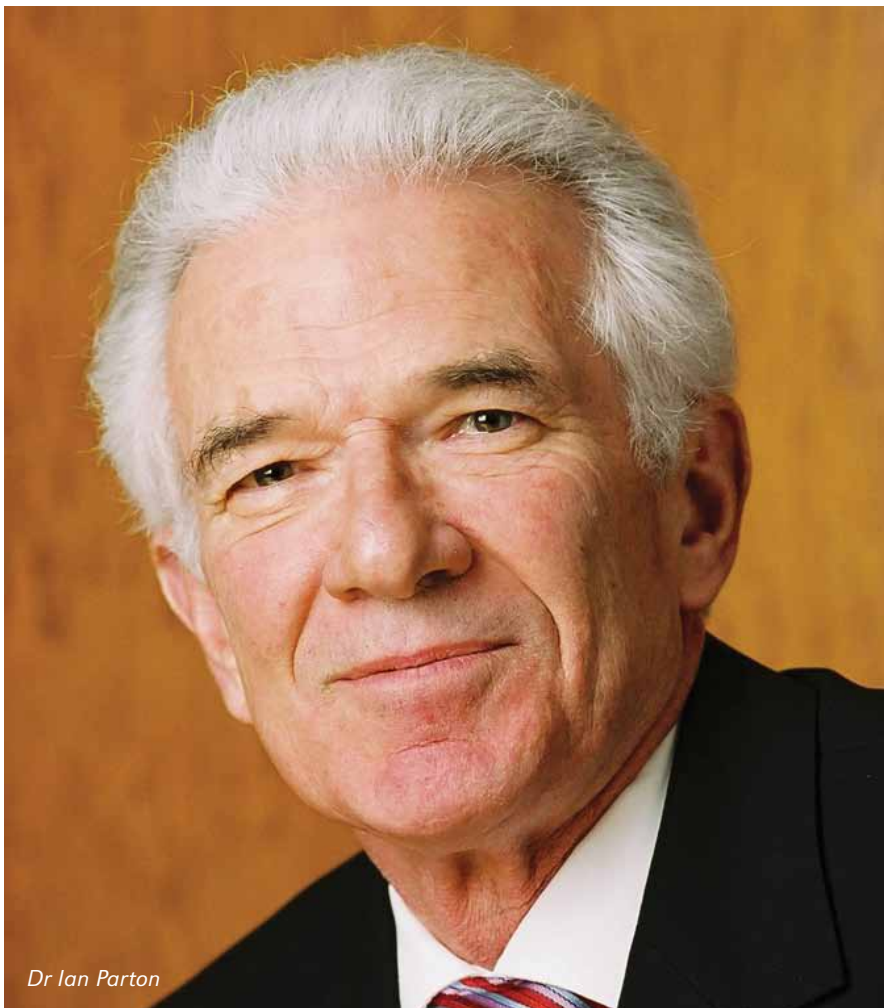
His research focus will be on the Variable Specific Impulse Magnetoplasma Rocket.

"I will be focusing on the fundamental plasma physics of the rocket with an aim to increase the efficiency and bring the device up to full operational capability. The overall goal is to use novel plasma propulsion devices for a myriad of applications ranging from orbital debris removal to drastically decreasing the transit time to Mars for human space flight."

His supervisor will be Professor Sigrid Close who is now working on a project at Stanford alongside the Ad Astra Rocket Company, who is contracting to NASA.

Ivan says he cannot thank his professors in the Chemical and Materials Engineering department enough.

"It has become evident that the whole engineering programme at The University of Auckland has laid a solid foundation that has given me the research, industrial, and academic opportunities needed to propel me into the space arena. I am proud to be an alumnus of The University of Auckland and will never forget my undergraduate experiences."



Dr Ian Parton

New Pro-Chancellor for the University

Prominent Auckland engineer and company director, Dr Ian Parton, is the new Pro-Chancellor of The University of Auckland.

He will deputise for Chancellor Roger France whose governance role includes chairing University Council meetings, presiding at graduation ceremonies and representing the University on formal occasions.

Dr Parton joined the University Council in 2008 after being elected as one of three representatives of the Court of Convocation.

He has a Bachelor of Engineering with first class honours and a PhD from The University of Auckland. He is a past-president of the Institution of Professional Engineers New Zealand (IPENZ), a Distinguished Fellow of IPENZ and a Fellow of the Institute of Directors.

He was elected Pro-Chancellor in place of Lindsay Corban who served a two-year term and remains on the Council.

Dr Parton said he was honoured to be appointed Pro-Chancellor. "The University faces a challenging decade with the largest ever building programme on the Symonds Street campus about to be implemented.

"As well as contributing to the governance of the University, I will be pleased to use my engineering skills to assist the Council in keeping abreast."

Second Oscar for Sagar

Alumnus Mark Sagar received his second consecutive science and engineering Oscar for the development of technology that brings characters like Benjamin Button and the Na'vi people from Avatar to life.

The award honours his development of influential facial motion capture technology. The facial retargeting techniques he has created allow the expressions and emotion conveyed on the face of an actor to be digitally captured and then retargeted to be animated as corresponding expressions on a digital character. This is achieved with a high degree of realism and enables the performance to come through in a meaningful way.

Mark, who works for Weta Digital, studied human emotions and worked with psychologists in order to develop the technology.

He is a former medical researcher who started his career building computer simulations of the human eye for Auckland doctors.

Mark has a BSc and a PhD in Engineering from The University of Auckland.

His PhD research, completed in the late 1990s, was a landmark study in how to develop an anatomically correct virtual eye and realistic models of biomechanically simulated anatomy. It was one of the first examples of how believable human features could be created on a screen by combining computer graphics with mathematics and human physiology.

During his acceptance speech Mark thanked the many amazing and talented people he had worked with over the years and who had given him the opportunity to begin his research, including his PhD supervisors at The University of Auckland, Professor Gordon Mallinson, from the Department of Mechanical Engineering and Professor Peter Hunter, Director of the Auckland Bioengineering Institute (ABI). Mark also thanked Research Fellow Dr Stuart Norris.

Last year Mark was one of a group of four who won a scientific and engineering award for a lighting stage and facial rendering system they developed. It was used to create realistic characters in Spiderman 2.

The awards were held in Los Angeles on Saturday 12 February.



Mark Sagar

Alumni Profile



Chris Liddell

Liddell steps down after record IPO

At the end of last year, Chris Liddell not only celebrated his one-year anniversary with General Motors, but also the company's record breaking initial public offering. The offering allowed GM to burst back on the scene after being plunged into a government-led bankruptcy 18 months earlier. But just four months later he announced his resignation as Chief Financial Officer.

The distinguished engineering alumnus and high profile businessman left GM on 1 April 2011. He is succeeded in the role by fellow Kiwi and former vice president, finance and treasurer for GM, Dan Ammann.

Liddell feels he has achieved what he had set out to do in the role and does not want to be a CFO again, having performed the role successfully at two major companies, first Microsoft, and later at GM.

Liddell's career has been quite a ride and although he was only at the company for a year, his stint at GM was a resounding success.

He could not have predicted that launching an international career at age 45 would put him behind GM's wheel seven years later.

Liddell was at the top of New Zealand's corporate ladder, as CEO of Carter Holt Harvey, when he decided to take on the role of CFO at Carter Holt Harvey's parent company, International Paper, in Connecticut in 2003.

Liddell was faced with plenty of challenges when he arrived in America.

"Clearly the scale of business is significantly different over here. Also, I went into a totally new environment where I had no background and didn't know anyone – so lots of challenges!" says Liddell.

In January last year the high-flying alumnus known for his financial acumen took on a new challenge; leaving his secure and well paid job at Microsoft to work as the CFO and VC for General Motors.

"Many thought coming to GM was a big risk, but it proved to be a good move. If you don't take a certain level of risk, you can't advance your competitors and you end up "with the pack." You may not win 100 percent of the time, but taking measured, calculated risks often presents the biggest rewards – personally and in business, Liddell says.

"I love a challenge, and I love cars. GM offered me both!"

As Liddell suspected the move did have huge rewards. He has proved himself to be a key

player in corporate America and led GM to its strongest annual performance since 1999.

In 2009 General Motors filed for the fourth-largest bankruptcy in US history, the biggest for an industrial company. In a highly controversial move the US Government bailed GM out with US\$50 billion in July last year.

A mere 18 months later, led by the former Kiwi executive, GM was back making profits. Liddell and his team completed the world's largest public share offer ever. The float raised NZ\$30.1 billion. This rare piece of corporate good news meant the US Government could sell up a lot of its stake in the company, moving from 61% ownership to less than 30%.

"Being part of the turnaround and the landmark IPO was a once in a life time opportunity and I wanted to be part of restoring a great American icon to the great company it can be," Liddell says.

President Barack Obama called a press conference stating that "one of the toughest tales of the recession has taken a step towards becoming a success story". This has been backed by financial commentators who deem the company's restoration as "near miraculous".

Two years on from bankruptcy, GM posted 2010 results that astounded the public, with GM earning \$4.7 billion for the year; the first annual profit since 2004.

He says his success at GM is “what you spend your career building up to”. Liddell was named Business Leader of the Year by the New Zealand Herald in 2010, and was awarded the inaugural Lifetime Achievement Award as part of the 2011 New Zealand CFO awards.

Liddell says GM had done a lot of the hard yards before the bankruptcy.

“The old General Motors had made some big gains in recent years, including its leadership position in China, resurgence of its Buick, Cadillac and Chevrolet brands and a product pipeline full of very competitive cars, crossovers and trucks.

“But the bankruptcy also allowed us to restructure our balance sheet and shed historical costs, and to create an entirely new company and put it on a path toward solid footing.”

Before gaining a footing on the international business stage Liddell, who is the son of a teacher and homemaker, attended Mt Albert Grammar in Auckland, where he was a prefect, dux and played in the First XV. Ever the sportsman he won an award for best all round sportsman at Grammar.

Liddell graduated with a Bachelor of Engineering with honours from The University of Auckland in 1979. He specialised in Civil Engineering. He also has a Master of Philosophy in Management Studies from

Oxford University in England.

Liddell says his engineering degree gave him the skills to “break complex thoughts, data and subjects into pieces and understand their inter-dependency”.

“I find that is an essential step toward bringing meaning and insight to otherwise useless information. That’s how effective decisions can be made.”

The rugby obsessed expatriate is a patron of The University of Auckland’s fundraising campaign and awards university scholarships at Mt Albert Grammar. Liddell is a Distinguished Alumnus of The University of Auckland.

He began his career working as an analyst at investment bank Credit Suisse First Boston, where he rose to become joint Chief Executive Officer. From Credit Suisse First Boston he moved to Carter Holt Harvey and then to International Paper. Two years after taking on the role at International Paper he switched industries again, becoming CFO at Microsoft. Liddell was highly successful at Microsoft overhauling their financial systems.

When Liddell left tech giant Microsoft to take his role at GM he had a sterling reputation but no direct experience with the industry.

Liddell says moving from Microsoft to GM was “exciting to say the least”.

“While some of the core elements of the CFO position are quite similar – specifically around managing the financial operations of the business – others are quite unique. At Microsoft there is a constant focus on innovation but a fair level of predictability. At GM, the business has an entirely different level of complexity.”

Liddell is an active member of environmental projects in New Zealand. He is a member of the trust that has overseen the restoration of Rotoroa, an 82ha island east of Waiheke.

Liddell describes himself as “a passionate and patriotic Kiwi” who was always pulled back to New Zealand.

“I come home to New Zealand quite frequently and try to maintain as strong a connection as I can. More time in New Zealand is definitely in my future, but it is hard to know exactly when,” he says.

GM donated \$268,000 to the Christchurch Relief Fund, a move Liddell says wasn’t because he is a Kiwi but one he did encourage them to think about.

When asked what his greatest achievement is Liddell proclaims “I haven’t had it yet!

“Seriously, I hope that I continue to have a positive impact on the world in some way.”

2011 Reunion of the 1963 Ardmore Class

Some of the Ardmore class who started in 1963 celebrated recently with a weekend on Waiheke. Boyd Miller shares his experiences at the reunion.

We arrived in twos and threes to Charley Farleys on Onetangi Beach, Waiheke Island for a reunion of the guys who started at Ardmore about 1963. Some of us had met two years ago, some hadn’t seen the others for yonks. A noisy shared meal for 38 people was interrupted by Bill Larsen’s announcement that there had been a decent earthquake in Japan and a tsunami was on the way. And there we all were at a north-facing beachfront café, wide open to the sea! The noisy chatter soon resumed.

On Saturday morning the obligatory engineering event was a visit to the wartime fortifications at Stony Batter. A very enthusiastic Sue, with her guide team, showed us the history, the artefacts and photos, the



tunnels, gun emplacements and the underground structures. It’s a pity that this very substantial and extensive facility was allowed to be pillaged and vandalised for so many years. Lunch at Passage Rock vineyard capped a good day.

In the light of the tsunami threat the fishermen had deferred their planned early start, but came home from an afternoon trip with a good catch.

The bush walkers met at Rocky Bay and followed the track around the coast to Te Whau Vineyard for a tasting. Then up the road to Trig Point, and down through some very impressive bush to a welcome fresh muffins at Gina and Monty Blomfield’s holiday home.

(Continued on page 22)

Alumni CONTINUED

The formal occasion of the weekend was a dinner for 44 at The Goldie Room. Darryl Dorrington kicked things off by introducing the occasion, I read the good wishes and excuses from those not attending, and proposed a toast to "absent friends". The Dean, Professor Michael Davies brought us up to date with

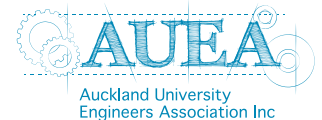
developments in the Faculty, and commented on the Ardmore spirit that was obviously present on the night. Bill Scheissel told tales of life in Kyrgyzstan and other outlandish places. Good food, good wine, a rolling slide show of Ardmore pictures, and the very snappy music from Anu Grace and her Chocolate Fish trio

rounded a very satisfying night.

Sunday brunch at Darryl and Marilyn's in the bush and overlooking Palm Beach, barbecued fish caught the day before and a heap of great food – what more could you ask to finish to a very successful weekend. Bring on the next one in two years or so!



From the AUEA President



I trust this edition of the Alumni News finds you all well. I know many of you are busy in what continues to be a challenging economy and at a time when many of us have been affected by the Christchurch earthquake. To those who have been affected by the earthquakes, our thoughts and support as alumni are with you. It has been fantastic to see the response of so many engineers to the events not only here in New Zealand, but also in Japan.

At the same time there is much happening within the alumni and the AUEA on your behalf.

The Ardmore Lunch was held again at Beaufords on 16 March. As usual the event was a sell-out. The format of the lunch was slightly different this year with tables dispersed across the lawn and, with a brilliantly fine day, the setting was perfect. There was a good cross section of alumni and it was pleasing to see a number of younger alumni present. Former President Dr Ian Parton welcomed those present and spoke briefly on AUEA activities during the year, particularly the Associates and Workplace Champions programmes. He went

on to say that the Executive Committee is committed to its goals of building a strong alumni organisation and encouraging on-going philanthropic donations to fund AUEA activities.

As we progress through the year we are planning alumni events in Hamilton, Tauranga, Wellington and Christchurch. We also have growing interest from offshore. The AUEA Annual Dinner will be held on 23 September – aim to book early, this is in Rugby World Cup 2011 territory. We will also be holding a few extra events in the preceding week, details to be announced.

After much planning we are in the process of launching our own website and re-designing our brochure and logo, thanks to the generosity of the Faculty who will manage it. This will allow us to communicate more regularly and keep you all up to date.

Many thanks to those who continue to give generously. As a committee we remain committed to raising the number of alumnus donating and achieving our overall target of a \$5 million endowment fund.



I wish you all the best for the year ahead. If you want to know more about the AUEA and its work with alumni please contact me.

For those wishing to be a part of the Associate programme, which is designed for corporates wishing to play a significant role in the alumni and gain direct access to the Faculty, please contact either Ian Parton ian.parton@xtra.co.nz or myself dean.kimpton@aecom.com. Likewise the Champions programme, which is for individuals, should contact Matt Thompson Matthew.Thomson@opus.co.nz.

Upcoming Events



2011 Alumni Dinner

2011 will be a milestone year for New Zealand, as we host one of the world's biggest sports events, the Rugby World Cup. The Faculty of Engineering will also be celebrating as we mark the significant achievement of all alumni who graduated in a year ending in 1: 1951, 1961, 1971, 1981, 1991, 2001.

The 2011 Alumni Dinner is booked for Friday 23 September. Usually we hold the dinner on a Saturday but to get into the rugby fever the Dinner will take place on the

Friday to gear everyone up for the New Zealand versus France game the following evening at Eden Park.

The dinner will be held at the Pullman Hotel Auckland (formally the Hyatt Regency) at the corner of Princes Street and Waterloo Quadrant near the University campus. The black tie event will take place from 6:30pm to midnight at a cost of \$105 per person.

The annual dinner is a unique opportunity for members of the Faculty, University and old friends to reconnect and share experiences. We warmly encourage all alumni to attend and look forward to hosting you.

We will also hold our Faculty and Ardmore tours on the same weekend.

There will be a tour of The University of Auckland and of the Faculty of Engineering Labs for alumni on Friday 23 September, at The University of Auckland.

Alumni will have the opportunity to tour the Ardmore Campus and Tamaki Campus on Saturday 24 February.

To attend these events please complete the enclosed registration form. If you are interested in one of the tours please register your interest on the form. If you would like help putting together a table of friends, to reserve a table of ten or more, please contact Sharon Andersen at s.andersen@auckland.ac.nz or phone +64 9 373 7599 ext 88225

Other Alumni events 2011

Melbourne Alumni and Friends reception

Guest Speaker: Professor Richard Faull,
Director of the Centre for the Brain Institute
Tuesday 17 May 6:30-9pm
The Westin Melbourne

Sydney Alumni and Friends reception

Guest Speaker: Professor Richard Faull,
Director of the Centre for the Brain Institute
Wednesday 18 May 6:30-9pm
Four Points Sheraton

Kuala Lumpur Alumni and Friends reception

Sunday 29 May 6:30-9pm
Crowne Plaza Mutiara

London Alumni and Friends reception

Guest Speaker: Dr Julie Maxton,
Director of the Royal Society UK
Tuesday 14 June 6:30-9pm
The Royal Society

Tauranga Alumni and Friends lunch

Guest Speaker: Professor Charles McGhee,
Chair of Ophthalmology
Wednesday 6 July 12-2pm
Mills Reef Winery

If you would like to attend any of these events please contact Sharon Andersen at s.andersen@auckland.ac.nz or phone +64 9 373 7599 ext 88225.

For updates and more information on any of our alumni events please visit: www.alumni.auckland.ac.nz/events

Are you interested in contributing to the health of our nation, the growth of our economy and the future of our cities?

Come along to the Faculty of Engineering's lively and informative postgraduate evening, where we will be showcasing some of our world-leading research.

POST GRADUATE WEEK 16-20 MAY
Register Now! www.auckland.ac.nz/postgradweek

Foundations for the future

Thank you donors

When you provide a gift to the Faculty of Engineering, you are supporting New Zealand's top university based on the three major international ranking systems: Times Higher and the QS World University Rankings, and the 2011 Academic Ranking of World Universities (Shanghai Jiao Tong University).

Thanks to the generosity and commitment of distinguished alumni, industry partners and friends, the impact of the Faculty is felt around the world - through ground-breaking research, and graduates who become leaders in their professions and communities. These donors understand that the Faculty of Engineering requires their loyal support and financial involvement to reach our goals. Monetary assistance helps to ease the financial burden of countless engineering students. It also empowers us to continue our tradition of excellence in research innovation and assists us in providing students with a world-class education, thus building bridges to a better future for us all.

With our students and your generous support you can be proud that you are making an investment in the future of Engineering. You can make donations into any one of five funds listed. Your contribution will be channelled directly into

that fund. Donations can be made by completing the attached form or if you would like to talk to us about other ways in which you would like to assist please contact our External Relations Manager, Sharon Andersen.

AUEA Cecil Segedin Endowment Fund

Established to recognise the significant contribution of Cecil Segedin's work to the fields of Engineering Science and Applied Mathematics. The fund will provide financial support for undergraduate students.

AUEA Ardmore Fund

Established by students from the School of Engineering at Ardmore, class of 1957-59, after their successful reunion in April 2000. The awards are made to students who have excelled academically and who exemplify the camaraderie, school spirit and values representative of "The Ardmore Years". Special consideration is given to students experiencing financial hardship.

Colombo Plan Scholarships

The Colombo Plan was formed in 1950 to assist economic development in South and Southeast Asia. It enabled students from the region to train in more developed countries in areas such as dentistry, agriculture, food processing and engineering. We have had over 220 Colombo Plan

students join the Faculty between 1950-1970, many of whom have gone on to become international leaders in industry and research making significant economic and social contributions in their home countries and throughout the world. These scholarships will go to assisting applicants from participating countries in the Colombo plan.

Engineering Endowment Fund

Established with the specific purpose of helping fund much of the specialised equipment needed for research purposes. For the Faculty to be at the forefront of engineering we need to invest heavily in our future. Research projects, upgrading and expansions of our physical facilities and support for selected academic positions. This fund will help us to achieve our goals in these more than competitive times, and see us continue to maintain our position as a world wide leader in engineering.

AUEA Endowment Fund

Established by AUEA, a committed funding partner of the Faculty of Engineering, to support the need to attract and retain the most talented staff and students possible. The fund's main focus is on providing undergraduate, postgraduate and doctoral scholarships. The significant and projected growth of the Faculty is in need of your generous support.

YES, I would like to support

AUEA CECIL SEGEDIN ENDOWMENT FUND

AUEA ARDMORE FUND

COLOMBO PLAN SCHOLARSHIPS

ENGINEERING ENDOWMENT FUND

AUEA ENDOWMENT FUND

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Please complete form and return to Sharon Andersen. Thank you for your generosity. You can be proud of your commitment to making a difference in our young students' lives.

If you are making a donation from the United States, please make cheque payable to Friends of The University of Auckland and send to Friends of The University of Auckland, c/- Gift Processing, External Relations, The University of Auckland, Private Bag 92019, Auckland 1142, New Zealand



THE UNIVERSITY OF AUCKLAND
FACULTY OF ENGINEERING

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