

Auckland

MAKING AN IMPACT

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Ion men

Pure physics research spawns unimaginable industries

On the fan trail

Entertaining rugby fans

NZ to China

MBA students pave way for business in the East



THE UNIVERSITY
OF AUCKLAND

NEW ZEALAND

Te Whare Wānanga o Tāmaki Makaurau



Ion men

Whichever way you view the latest technology – whether it's looking into a camera, at a smart phone or watching television – you'll be looking at a flat panel screen display created by embedding ions such as boron or phosphorus into a panel of silicon.

What you may not know is that the electromagnets used for embedding these ions are made at a factory in South Auckland using technology that was spawned from pure physics research at The University of Auckland – long before cell phones and silicon-based computers were developed.

In 1968, PhD student Hilton Glavish (pictured right) completed his physics research building an intense polarised ion source for use in the study of spin angular momentum effects in nuclear reactions. This attracted overseas attention and soon he was designing polarised ion sources in the University's Department of Physics while the physical components were built by a young Auckland engineer, Bill Buckley (pictured left).

When Hilton joined the Physics Faculty at Stanford University, the two men continued to collaborate across the Pacific. As Hilton became an acknowledged expert on ion beams and the complex electromagnets required to control them, they turned their expertise to designing and building the implanter beam lines which had rapidly become the preferred method for manufacturing transistors on silicon.

Bill's company, Buckley Systems Ltd, is a world leader in the manufacture of the electromagnets and vacuum systems used in ion beam lines, not only for the ion implanter industry, but also for the medical industry and the synchrotrons used in international nuclear laboratories. In September he was named Ernst & Young New Zealand Entrepreneur of the Year.

Hilton went on to form his own company, Zimec, in the USA and continues to design and patent ion accelerators and devices for the semi-conductor industry. His latest project with Bill, in conjunction with Nissin Ion Equipment of Japan, is high-definition silicon flat panel displays as large as 1500mm x 2300mm. The machines that implant the ions in these weigh 25 tonnes and contain the largest electromagnet ever built by Buckley Systems Ltd; they are already being produced at the rate of three per month.

"This \$100 million a year industry in South Auckland has stemmed from the original pure research and good physics conducted at The University of Auckland," says Bill. And that's why, in 2004, he and Hilton jointly donated \$1.5million to endow a chair in Physics at the University. It was one of the first chairs of this kind in the world and was created for the purpose of applying physics research to a problem of great global significance, namely climate change.

"Just as pure physics research has spawned unimaginable industries in the past, I think this may well happen again with respect to climate change," says Hilton, who won a University of Auckland Distinguished Alumni Award in 2005.

Now he and Bill are also funding a senior lectureship in climate physics at the University, to consolidate this work. "We wanted to give something back to the University," says Bill.

"And we wanted it to be new, exciting and in a field where New Zealand could make a mark," adds Hilton.

www.buckleysystems.com www.zimec.com

Auckland Now showcases the impact The University of Auckland has on Auckland, New Zealand and the international community through its teaching, research and community service. For more information contact us at: aucklandnow@auckland.ac.nz



China is a daunting prospect for a small New Zealand company looking for new markets, so John Brooks Ltd, a leader in water pump control systems for dairy farms and wineries, teamed up with The University of Auckland for help.

Students on the MBA International Business Course were given a real-world project to pursue: they identified Guangzhou in southern China as having potential manufacturing and distribution partners for John Brooks Ltd, which has 26 employees across New Zealand.

The students researched and contacted potential partners in Guangzhou and raised money to travel to China to continue their investigations. Armed with training from New Zealand Trade and Enterprise and members of the New Zealand China Trade Association, they met local companies and distributors.

After gathering more data the students prepared a report for John Brooks Ltd: it found profitable opportunities in China and recommended a three-phase entry strategy to gain and grow market-share and to protect intellectual property.

“We could not have wished for a more encouraging outcome for entry into the southern China market and it will undoubtedly lead to substantial business,” says Managing Director, John Brooks.

The University’s MBA International Business Course is unique. Clients benefit from having a student team of experienced business professionals exploring market opportunities while students benefit from being immersed in foreign markets and gaining genuine experience for their future work.

In the past 18 months 110 MBA students have visited Seoul, Kuala Lumpur, Shenzhen, Hong Kong and Guangzhou – markets of about 45 million people including those that are opening up under the NZ-China Free Trade Agreement. They have worked with 25

companies and achieved an estimated \$2 million in sales results. Client companies include airlines, architects and producers of infant milk formula and electro-acoustic technologies.

Phitek Systems Ltd engaged an MBA team to create a market entry plan into Hong Kong for its Blackbox line of noise-cancelling headphones and ear phones.

“We conducted product demonstrations with buyers and owners of high-end audiophile shops, music stores and airport duty-free shops,” says team leader Brad Weekly. “Our team’s modelling conservatively projected profitability within five years of entering the Hong Kong market, with much larger profits in the following five years after Blackbox goes into mainland China and selected Asian hubs.

“Phitek says we have delivered them a blueprint that will allow a successful market entry by embracing low-volume, high-quality stores and duty-free shops.”

Associate Professor Paul Hoskin says the lessons learned by the MBA teams are of value to New Zealand business in general. “For one reason or another, an assumption that may be valid in New Zealand may be wrong in southern China. You can only know about this after spending time in-market. “For example, one company that provides IT and GPS solutions for deploying emergency vehicles found out from their MBA team that GPS-based deployment in Hong Kong is nearly impossible because the services sector is very fragmented and satellite signals are blocked by the tall buildings.”

Course founder Peter Withers, says “a key element of the executive MBA experience is to acquire the decision-making skills needed for New Zealand companies to be internationally competitive”.



Top rank

Morgane Elsen (pictured above) grew up in Belgium, close to some of the greatest art galleries and museums in the world, yet she chose to study Art History at The University of Auckland. As well as enjoying the New Zealand way of life, she was attracted to the University's high ranking internationally.

"I originally came to New Zealand on a school exchange," she says. "I really liked the lifestyle and the fact I could study at a world-class university encouraged me to stay."

According to the latest QS World University Rankings® – an annual league table of the world's top 600 universities – Auckland is the highest ranked in New Zealand at 82. Second is the University of Otago at 130 and the University of Canterbury is third at 212.

The University of Auckland's world ranking was also an important factor for 24-year-old Satya Brota Guha from Dhaka, Bangladesh, when he was considering where to study for his masters in electrical and electronics engineering. "Auckland's high ranking was the deciding factor over other universities," says Satya, who completed his undergraduate degree at North South University in Bangladesh, with exchanges to universities in Malaysia and Singapore.

The league table puts The University of Auckland on a par with prestigious international institutions such as Lund University in Sweden, 86, Fudan University in China 91, and The University of Adelaide, Australia 92 (Top of the list was the University of Cambridge, followed by Harvard.)

"I don't think New Zealanders realise what a truly world-class university they have here," says David Baker, the director of the University's International Office, who formerly held similar positions at Leeds and Durham Universities.

As well as its high overall ranking, Auckland is in the top 50 in individual subject areas: 18th in the world for Law, 23rd for Modern Languages, 27th in Psychology and 39th in both Medicine and Biological Sciences.

The QS World University Rankings® are compiled in close consultation with an international advisory board of leading academics. Universities are assessed on research, teaching, employability of graduates and global connections. These factors are measured by staff citations in respected journals, the ratio of staff to students, the experience of employers and the number of staff and students from overseas.

While the ranking is a key measure of the University's quality research and teaching, it is also critical for recruiting international students. We have 4,700 international students from more than 93 countries – by far the largest overseas student population in New Zealand. They pay full fees and contribute about \$70 million to the University's finances each year.

David says the University's long-term strategy is to attract more international students. However, some overseas governments will only sponsor students to the top 100 universities. "For example Chile has quite a big sponsorship programme but only Auckland and Otago in New Zealand meet the quality threshold to receive them. Other major international sponsors are less explicit about thresholds, but most seek to place their students at leading universities. So maintaining our positive ranking will continue to be very important."

www.topuniversities.com/university-rankings/world-university-rankings



Power of food

Popeye is an extreme example of “you are what you eat” as he downs a tin of spinach and gets a muscle-bulging burst of superhuman strength.

Certain foods have long been known for their health-giving properties but where do the nutrients go in the body and what do they do?

These are the questions that David Cameron-Smith (pictured), The University of Auckland’s new Professor of Nutrition, is exploring.

“I describe my research as nutrition on the inside,” he says. “We feed people different meals and different nutrients and then take samples of fat and muscle to study the way fat and protein, in particular, enhance health.”

David is focusing on the nutritional issues of an ageing population and he has already carried out studies looking at the benefit of giving protein supplements to older men after strenuous exercise. “There is a lot of synergy when exercise and protein are combined,” he says. “Exercise promotes muscle growth through one mechanism and the amino acids in protein supplements work via a different and complementary pathway.”

Consumers are demanding more from their food these days. As well as eating to fuel their bodies they want food products that boost their health, manage their weight and improve their immune system. David believes New Zealand can become a leader in developing these clinically proven “functional foods”.

His work is part of the University’s new trans-disciplinary Food and Health Programme which draws on experts in food science, process engineering, nutrition, health, social sciences and business to help companies such as Zespri, Fonterra and Comvita.

“One of the main goals of the Food and Health Programme is

to boost innovation and growth in the New Zealand food and beverage sector,” says Dean of Science, Professor Grant Guilford. “We work directly with companies to tackle problems as well as make discoveries that will help with diet-related health issues in different communities.”

A long-standing collaboration between engineers and chemists aims to develop food products that not only taste good but also have a pleasing texture. “We want to learn how to alter the structure of solid foods so that they feel good when chewed,” says chemical and materials engineer Dr Bryony James, who is working with food scientist Dr Bronwen Smith, Plant & Food Research and Massey University to investigate the microstructure of food.

“We’re looking at the mechanical properties of food from the first bite through to swallowing. This research would be impossible within only one discipline – it requires engineers to measure material properties, sensory scientists to evaluate mouth-feel and experts in chewing behaviour.”

In another project University scientists are screening fresh and processed mushrooms for novel bioactive molecules that may be used in the treatment of cancer. “At this stage our focus is on the medical implications of any novel compounds that we find,” says molecular biologist Associate Professor Geoff Krissansen who is collaborating with Food Scientists. “But there’s also a potential commercial benefit for local growers, if compounds from native mushrooms are found to have anticancer activity.”

The Food and Health Programme builds on relationships between University researchers, companies and the health sector, says Grant Guilford. “As a result, we’re on track to deliver substantial benefits for public health and the New Zealand economy.”

www.foodandhealth.auckland.ac.nz

Primed for life

When Courtney Meredith was studying English and Political Studies at The University of Auckland she never imagined she would combine both disciplines and perform a poem for the President of Germany.

Courtney has recently returned from a writer-in-residence position in Berlin, the youngest, first Polynesian and first New Zealander to receive the "Bleibtreu LiteraturRaum" residency. "I featured in the world premiere of Lemi Ponifasio's *Le Savali* at the Berliner Festspiele. The German President opened the evening with a speech, and out of the audience I rose and responded to him with *Mau*, written especially for the occasion."

Courtney, 25, has been rising to the occasion a lot since completing her Bachelor of Arts degree and three years of a Law degree at Auckland. "The University is a wonderful place to prime yourself for the real world," she says. "You're constantly challenged and always having to think a step ahead."

"I'm passionate about the Arts and about putting myself out there. There's nowhere I can't go and that's what I tell the youth I work with – that the options are always there."

Courtney is the Auckland Council's Community Arts Co-ordinator for Arts and Culture (Central) and involved with everything from "community interface to strategising, managing staff and delivering projects".

These include establishing a Youth Arts Fono for next year and founding a young writers festival as part of New Zealand Book Month. Her weekly Youth Arts Programme of circus and drama workshops will evolve in 2012 to include more communities and art forms.

Next April Courtney will tour Indonesia as part of a group of international authors – the only New Zealander and Polynesian. Back home her first play *Rushing Dolls*, which won two Adam NZ Play Awards this year, is ready for production and a book of poetry is ready for publication.

Courtney is also committed to encouraging emerging talent. "I believe a true artist creates artistic opportunities for others. I am more sure than ever that our ability to support one another will not only add a new dimension to the art we create, it will define us as a generation."

www.courtneymeredith.com

