

Matter of Fact

Newsletter from Science & Engineering and Computing & Mathematical Sciences



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

Autumn 2012

Tauranga marine life may hold bio-medicinal secrets

A University of Waikato student is creating an inventory and repository of marine organisms in Tauranga Harbour to see if there are potential cancer-or PSA-beating compounds in Bay of Plenty waters.

Summer Research Scholarship student Nikki Webb has been creating an inventory and a bio-resource repository of Tauranga harbour marine life, checking those organisms for potential drug and agrichemical leads.

Nikki's research is part of a bigger study by The University of Waikato's Chair in Coastal Science Professor Chris Battershill looking at the biochemical machinery of marine organisms, to generate bio-medicinal and agrichemical leads.

New Zealand is internationally recognised as being one of the top source countries for bio-discovery leads with a drug licensed for breast cancer in late 2010 and three other compounds currently in late phase clinical trials.

"We're going to have a look at some extractions of these organisms and see if they have any bioactive properties which could then hopefully evolve to be anti-cancer drugs or PSA or other agrichemicals."

To date, Nikki has collected algae species, sea weed, sea sponges, sea squirts and other samples of marine life samples from Leisure Island, Waikareao Estuary and Rabbit Island.

Once the inventory is complete it will be available for educational purposes in museums around New Zealand.



Nikki Webb has been creating an inventory and a bio-resource repository of Tauranga harbour marine life, checking those organisms for potential drug and agrichemical leads.

University engineers create a smart water meter

University of Waikato scientists are hoping to create a smart water meter, completely powered by the water running through it.



PhD student Mark Jones and Summer Research Scholarship student Wayne Crump (pictured left to right) are looking at the best way to harvest power by separating electrical charge in water, without moving parts.

They're looking to create a charge separation through the use of a streaming potential cell, and are hoping to harvest enough power to run a smart water meter that can wirelessly report water consumption.

The cell works by forcing water through a glass micro-channel that has a charge bound to its surface. As water travels through the channel, ions of an opposite polarity cling to the charged surface. When pressure pushes these ions through the channel a useful amount of electricity builds up.

INSIDE...

Soil scientist

Riki Lewis works for the Queensland Government

Page 2



Puffer fish app at hit

Waikato students develop asthma app for kids

Page 3



Work placements get results

Success story of three BE graduates

Page 3



Monitoring green house gas emissions in Oz

Graduate Profile

High School: Cambridge High School

Degree: BSc, MSc

Job: Soil Scientist

Employer: Department of Employment, Economic Development and Innovation (DEEDI), Queensland Government

For Riki Lewis, studying Earth Sciences at Waikato has led to an exciting job as a Soil Scientist with the Queensland Government.

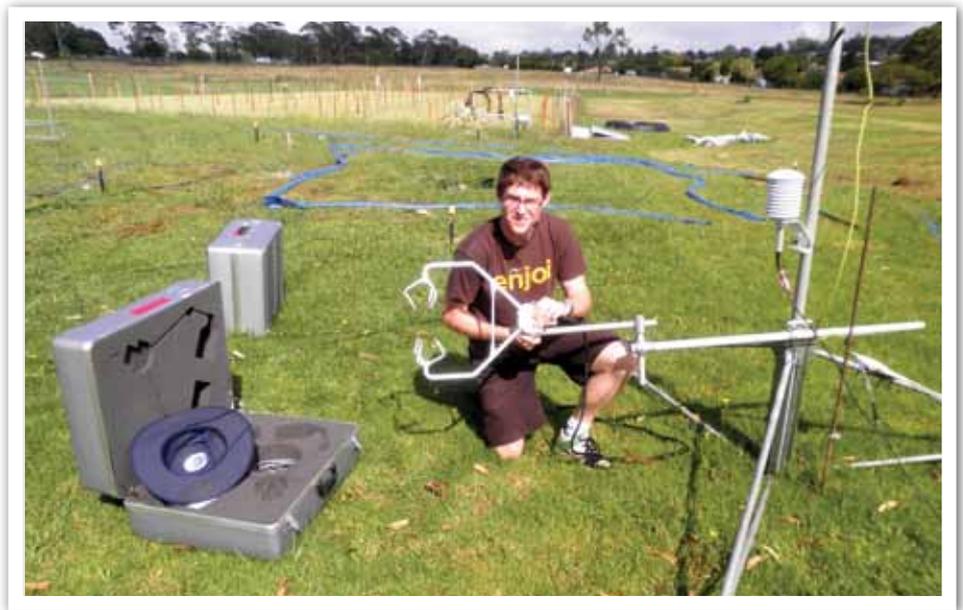
"I travel to beef feed lots to collect soil samples, which we test on site. Currently I'm in charge of running an experiment in which we're trying to validate a new experimental method against an older, more trusted method.

The validation experiment involves running a machine which analyses greenhouse gases (GHG) at very low concentrations. I then collect and process the meteorological data."

The government will use this data to help determine an acceptable level of GHG emissions from feed lots and to set a limit from which farmers will begin to pay carbon tax.

Riki moved straight onto tertiary study following his teenage years at Cambridge High School.

"The practical skills I learnt during study were



Riki Lewis works for the Queensland Government collecting and analysing data on green house gases.

invaluable for securing a job after graduation."

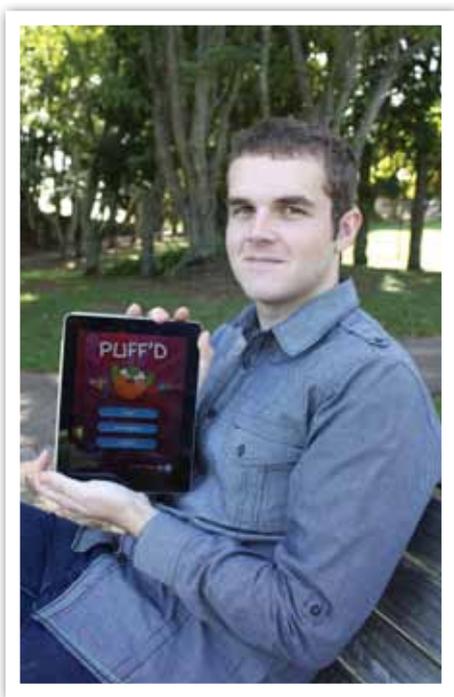
While studying he attended conferences in New Zealand and Australia, which gave him one on one contact with industry – a valuable bonus when looking for jobs later in his career.

As for study advice? "Study what you find interesting. Subjects you are interested in will be

more enjoyable and you'll do better in them. If you're unsure about anything, just ask. Lecturers and support staff at Waikato are excellent."

Interested in Earth Sciences? Visit www.sci.waikato.ac.nz/earthsciences to discover the opportunities available at Waikato University.

Students make Sailor the Puffer fish an Apple app



Apple Puff: Waikato University student Daniel Loomb holds PUFF'D, the Apple app he and a team of Waikato students developed for Asthma Waikato.

A team of students from Waikato University have developed an app to teach kids with asthma how to best manage their condition, with the help of a wee puffer fish called Sailor.

Computer graphic design student Stephen Sherman and computing and mathematical sciences students Benjamin Squires, Billy-Jo Hunia and Daniel Loomb have been working with Asthma Waikato to bring to life the Apple application PUFF'D.

The game is part of a project aimed at raising awareness of asthma among 5-10 year olds. Asthma Waikato has links with Sport Waikato's Project Energize to deliver Sailor the Puffer fish into every Waikato school.

PUFF'D, which is now available to download on the app store, sees Sailor the Puffer fish inside a pair of lungs, bouncing into and destroying asthma triggers such as cold, pet dander and smoke.

Team leader Daniel Loomb says the students got involved as part of a software engineering paper which involved connecting with businesses in the community.

"The direction the game went in was set from the start by Asthma Waikato. They told us what they were looking for and we came back to them with a number of game ideas for them to choose from."

"We met with Asthma Waikato every Monday for a whole semester," says Daniel. "This was crucial in forming a solid relationship between us and the client. We would show them how our progress was going and they would tell us the tweaks they would like made to help get the asthma health message across."

Business Manager for Asthma Waikato Vikki Blundell says the Apple platform was chosen because it's a new and innovative way of getting the message out to kids.

"Sailor is well known in the Waikato as he has been delivered into all schools by Project Energize. Kids who see the iPad game are amazed Sailor has his own game and think it is very cool."

Visit www.scms.waikato.ac.nz to find out more about studying with the Faculty of Computing & Mathematical Sciences.

Engineering grads popular at Dairy Automation Ltd

The University of Waikato's science and engineering work placement programmes often result in students securing full-time work before they graduate.

Such is the case for three current Dairy Automation Ltd (DAL) employees, who each found full-time jobs with the company following electronic engineering degrees and work placement programmes at the University of Waikato.

The most recent employee, Mark Wilson, has a full-time role as a production technician, after completing a work placement there last year. His technical competency and professional attitude during his placement helped him to secure full-time employment in the production room upon completion of his study.

Mark's manager Richard Doohan completed his studies in 2005. Following his degree Richard worked at Sensortec Ltd (a company which would later form Dairy Automation Ltd), where he completed the requirements for his final work placement, before moving to DAL as the technical manager for building, production, and research and development.

Mark's main role at DAL involves technical assembly of the products and supervision of the production team, alongside work mate and former work placement supervisor Chetan Jairaj.

Chetan completed his Bachelor of Engineering degree at Waikato University in 2010 and maintained his employment at DAL following a workplacement. Currently Chetan supports both



Three University of Waikato engineering graduates have been employed by Dairy Automation Ltd. From left, Chetan Jairaj, Mark Wilson and Richard Doohan.

production and R&D as a production engineer.

Dairy Automation Limited (DAL) is a 100% New Zealand owned company formed to provide effective automation solutions to New Zealand farmers.

"It's encouraging to see that the work placement programme at Waikato now has such a long history, that former graduates of the programme have since moved into significant management roles and are employing the new generation of students for work experience," says University of Waikato Work Placement Coordinator Dr Karsten Zegwaard.

As for study, Hamilton Boys' High old boy Mark didn't plan on a university career and had intended to train as a tradesman. Yet when a mate pulled

him along to the University's Engineering Open Day, he decided Waikato was for him. During study the social environment of the degree was the highlight and he enjoyed the team work during projects such as the first-year engineering Boat Design Competition.

Cooperative education is the combination of study and work and allows students to gain industry experience while gaining credit towards their degree and being paid for their work. The work placement programme is a compulsory element of both the BSc(Tech) and BE degrees at Waikato University.

Visit <http://coop.sci.waikato.ac.nz> to find out more about work placements at Waikato University.

Science & Engineering Open Days registrations open soon



Hands-on: Students at the 2011 Science Open Day and Engineering Open Day made the most of the workshops on offer.

Interested in science or engineering? Spend the day on campus with staff and students and experience either science or engineering through hands-on workshops and lab demonstrations.

Both full-day events are suitable for Year 11, 12 and 13 high school students, as well as adult learners. Attend just one event or register your interest for both.

Science Open Day: Wednesday 11 July 2012

Covers: biological sciences, chemistry, physics and earth & ocean sciences.

Engineering Open Day: Thursday 12 July 2012

Covers: electronic engineering, software engineering, chemical & biological engineering, material & process engineering and mechanical engineering.

Numbers are limited, so register your place as soon as possible!

Registrations for both events close 22 June 2012.

Registration packs will be sent out to schools from 14 May 2012. Alternatively, visit www.sci.waikato.ac.nz from 14 May 2012 to download a registration form.

Scholarships awarded to talented first-year Science & Engineering students



Winners: University of Waikato Science Admission Fees Scholarship winners each received up to \$4000 towards course costs.

Scholarships of up to \$4000 each were awarded to 28 first-year students from the Faculty of Science & Engineering last month. Science Admission Fees Scholarships are awarded to successful applicants in their first full-time year of a Bachelor of Science or Bachelor of Science (Technology). Bachelor of Engineering Fees Scholarships are awarded to successful applicants in their first full-time year of a Bachelor of Engineering.

Winners are selected based on high academic calibre in NCEA Level 3, leadership potential and involvement in sporting and community activities.

In addition to the monetary award, a congratulatory lunch was held for the first-year students, alongside scholarship winners from masters and PhD level within the Faculty.

The entrance scholarships are awarded annually. For more information visit www.sci.waikato.ac.nz/study/scholarships

Biology bootcamp tests students' skills

Four budding biology students have been selected to represent New Zealand in Singapore at the International Biology Olympiad (IBO) this July.

The students were selected following a recent week-long training event hosted by the University of Waikato and Massey University's Institute of Natural Sciences.



Of the 22 students from around New Zealand who attended the camp, the four students selected for the team were SuMin Yoon from Hamilton, Eddie McTaggart from Nelson and Richard Chou and Evelyn Qian from Auckland.

The Olympiad challenges exceptionally gifted young students in higher secondary school biology. The New Zealand team will compete against more than 60 countries in the prestigious international event.

Above, University of Waikato senior biology tutor Brydget Tulloch (left) demonstrates the art of fish dissection to St Cuthbert's College student Stephanie Chen and Sacred Heart Girls' College Hamilton student SuMin Yoon.

What's on

12-13 JUNE

Waikato Experience Biology Days

Year 13 students and their teachers are invited to attend our annual biology event. Lectures and lab work cover topics such as DNA technology, human evolution and animal behaviour.

Visit www.sci.waikato.ac.nz/webdays

14-15 JUNE

Osborne Physics and Engineering Days

Upper secondary school students and their teachers are invited to attend lectures and demonstrations relevant to the physics curriculum and current research.

Visit www.sci.waikato.ac.nz/ospendays

20 JUNE

NZIC Analytical Chemistry Competition

Teams of Year 13 students are set an analytical task requiring accurate and careful analysis of an unknown substance. The results are judged and prizes are awarded on the day.

Visit www.sci.waikato.ac.nz/chemcomp

11 JULY

Science Open Day

Experience a day in the life of a science student at Waikato. Attend labs and lectures on chemistry, biology, physics and earth sciences. Registration is essential as numbers are limited.

Visit www.sci.waikato.ac.nz/scienceopenday

12 JULY

Engineering Open Day

Spend a day at Waikato University learning about the exciting world of engineering. Participate in hands-on workshops and discover the study options available. Registration is essential as numbers are limited.

Visit www.sci.waikato.ac.nz/engopenday

24 OCTOBER

ChemQuest

Every year the Department of Chemistry offers Year 12 students from local secondary schools the opportunity to compete for the ChemQuest trophy and other prizes.

Visit www.sci.waikato.ac.nz/chemquest

Contact us

Science & Engineering

Phone +64 7 838 4625

Fax +64 7 838 4218

Email science@waikato.ac.nz

Toll free 0800 438 254

www.sci.waikato.ac.nz

www.facebook.com/WaikatoScienceEngineering

Computing & Mathematical Sciences

Phone +64 7 838 4322

Fax +64 7 838 4155

Email scms@waikato.ac.nz

www.scms.waikato.ac.nz