

Uni NEWS

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APRIL 2021



DR JOEL RINDELAUB

The comical analytical chemist is getting the air quality message across

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THE QUESTION OF VAPING

Dr Kelly Burrowes sets to work on a three-year research project about the safety of e-cigarettes

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INVESTING IN EDUCATION

Rutherford Medal winner, Professor Brian Boyd, gives support to first-year student Michelle Prasad

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GOT TEN MINUTES?

Dr David Moreau says high-intensity interval training isn't a fad – it's backed by strong research

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Just a few of the University of Auckland staff and student appearances in the media in the past month. Email: uninews@auckland.ac.nz

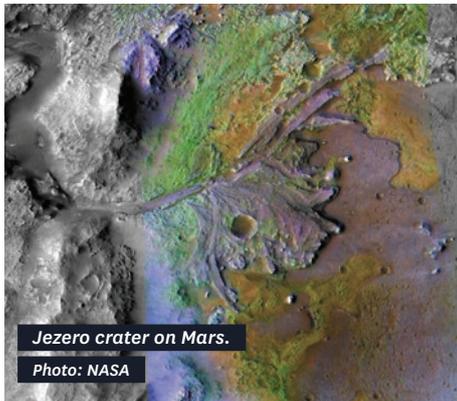


Fish have remarkable sensory abilities vital for survival.

FISH HEARING AFFECTED

Associate Professor Craig Radford's research on fish hearing was reported on RNZ then picked up overseas by *The Wired*. Craig and researchers from Marine Science, NIWA and James Cook University in Australia found that increased acidification in the ocean affects the development of fish ears. They measured the first evidence of what happens to reef fish hearing when larvae develop in a more acidic ocean and found that the fish suffered a reduction in hearing that affected their behaviour and directional abilities.

Link: tinyurl.com/craig-radford-fish



Jezero crater on Mars.

Photo: NASA

BEHIND THE NAME JEZERO

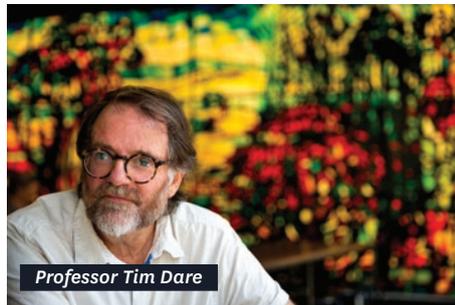
The Dean of Arts, Professor Robert Greenberg, is a linguist. His South Slavic expertise was behind his explanatory piece in *The Conversation*, later picked up by *Stuff*. Headlined: 'How did NASA's Martian rover come to land in a crater named after a tiny Balkan village?' the article explained the meaning behind the name of the crater Jezero on Mars. Jezero, which made headlines after NASA's *Perseverance* rover landed in it, is named after a village in Republika Srpska, the Serb-dominated part of Bosnia and Herzegovina.

Link: tinyurl.com/conversation-Greenberg

COPING STRATEGIES

Doctoral student Cui Le (Faculty of Education and Social Work) was in *Gay Express* about his research with gay male academics in China. He interviewed 40 academics there in 2018-2019 and found in order to work in universities they concealed their homosexuality and, for some, that went as far as to marry a heterosexual or lesbian woman. They also had to hide their support of gay students on campus, to avoid risk of being outed.

Link: tinyurl.com/gay-express-china-research



Professor Tim Dare

VACCINE PASSPORTS: DO WE DARE?

Professor Tim Dare (Philosophy) spoke about the dangers of introducing 'vaccine passports' in an opinion piece in *The Conversation* that was expanded on by *Stuff* and RNZ. Tim is involved in the ethics of data collection and says the use to which a vaccine passport might be put is key, as is the issue of equitable access to vaccines.

Link: tinyurl.com/conversation-tim-dare

MONEY BEHIND MISINFORMATION

Dr Andrew Chen, digital technology ethics researcher from Koi Tū: The Centre for Informed Futures, warned about a 48-page magazine that appeared in letterboxes headed 'The Truth About the Covid-19 Pandemic & Vaccines that We're Not Being Told'. He told the *NZ Herald* the magazine was unusual in that misinformation was usually spread online but this publication obviously had money behind it.

Link: tinyurl.com/andrew-chen-covid-mag



Dr Andrew Chen

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SURVIVE TO THRIVE LECTURE

The nutrition babies receive from birth influences their lifelong health.

For our smallest babies, what they eat and how they eat can have a significant impact on their developmental outcomes. These days, most babies born pre-term will survive, but the jury is still out on the best feeding strategies to help them thrive.

This public lecture and webinar discusses this issue. Hear from the director of the Liggins Institute Professor Frank Bloomfield, and paediatric dietitians Dr Barbara Cormack (Starship) and Tanith Alexander (Middlemore Hospital).

WHAT: Survive to thrive: Feeding NZ's pre-term babies better

WHEN: Thursday 15 April, 5.30-7pm

WHERE: Liggins Institute, 85 Park Road, Grafton

Register: tinyurl.com/liggins-april-lecture

EDITOR: Denise Montgomery

denise.montgomery@auckland.ac.nz

PHOTOGRAPHY: Elise Manahan, Billy Wong

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TIME TO GET HIGH AND INTENSE

Dr David Moreau says you don't need much time in your day to exercise your body and your brain.

Dr David Moreau doesn't buy the excuse that we don't have time for exercise.

His Early Career Research Excellence Award from the Royal Society Te Apārangi was for his research into the benefits of short bursts of high-intensity exercise. It shows just ten minutes a day is all we need to keep our brain and body functioning.

It seems for once fitness crazes are getting it right. High-Intensity Interval Training, or HIIT as it's known, is pretty mainstream these days and David's research shows HIIT's benefits include our ability to plan, focus attention and remember instructions.

"We've known for a long time that exercise is beneficial to the brain," says David, a senior lecturer in psychology in the Faculty of Science.

"It helps cognitive function and mental health, including conditions like depression. But, for a long time, people have thought the best way to get exercise was to do it for a long period of time at moderate intensity. That's not necessarily so."

What – all those hour-long aerobics classes in leg warmers were a waste of time?

"Labs across the world are now showing that high-intensity exercise – in just ten minutes a day – has major benefits. It's also great for the time-starved."

But you're not really going to make yourself fit by doing ten minutes a day are you?

"Well, yes. Studies show that with high-intensity regimens, your body doesn't just work out while you're doing the exercise. It's burning energy afterwards. The muscles are sore and need to get rid of the lactates, your metabolism increases for an entire day – even a couple of days. You actually burn more calories than you would after aerobic exercise. Afterwards, you're recovering for quite a bit of time and this plays a role in getting you fit."

David's research has mainly looked at the benefits of HIIT in adults up to the age of 40, but shows high-intensity exercise has advantages in younger and older people.

"You may have to adapt the workouts to your actual fitness level as you age, so they still remain at a high intensity but not an intensity that might be dangerous."

He says if your knees are blowing out and your body is generally falling to bits, HIIT can be perfect.

"High-intensity training is easier on your body



Dr David Moreau is a cognitive neuroscientist who says one reason people stop exercising is they get bored.
Photo: Elise Mandhan

***"High-intensity exercise – just ten minutes a day – has major benefits."* – Dr David Moreau, senior lecturer in psychology, Faculty of Science**

than aerobic exercise where you may be running for a long period and it's hard on the joints. You get a similar workout with high-intensity in a very short period."

You can even do HIIT in a pool.

"Olympic swimmers train like that a lot," says David. "They sprint and then recover for a while and sprint again. The average person can do something similar."

Some of David's research has been with school children and it's shown HIIT is very effective in getting those little brain cogs whirring.

"We published a study where we had this short workout video running in schools. In just ten minutes you prepare your students to be more alert and ready to learn."

"Typically, we would encourage teachers to do the ten minutes' exercise with their classes at the beginning of the day."

He says feedback was great and what also occurred was better cohesion between the students.

"They were sharing the moment, laughing, improving and encouraging each other. There are a whole bunch of things that come into play; it's a social aspect as well as a physiological."

Exercises for the children included squat jumps and jumping jacks. They were encouraged to go as hard as they could for bursts of 20-30 seconds and then rest for 20-40 seconds. Upbeat music helped them along as they followed the movements on a big screen.

"In some of the schools we also equipped

children with Fitbits so we could see the physiological benefits were actually happening."

David says even children with lower fitness levels showed big improvements.

"They're the ones who benefit the most. HIIT sessions act as a real equaliser too – people go as hard as they are capable of. There's no competition. They all have the same opportunities to exercise and the fitter ones just push themselves a bit harder."

David says popular exercise franchises like F45 and CrossFit that adopt these concepts, or programmes like Fast Exercise, are attractive because they reduce the boredom factor.

"One of the big reasons people stop exercising is they're getting bored with their workouts. But these kinds of routines change things up – there's a range of things to try."

David says the other way to keep going is to just have HIIT in your arsenal a few times a week.

"Then do something else at the weekend that you enjoy."

David's first language is French. He was born in France, went to University in Canada when he was 23 and at 26 went to Princeton University in New Jersey for his postdoctoral years. He came to Auckland in 2015. In July, it will be two years since he's seen his family, thanks to the pandemic. He's been keeping his mind off that with his research.

As well as studying physical workouts, David, who runs the Brain Dynamics Lab, is interested

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GOOD TO KNOW

From page 3

in brain-training workouts. Researchers are exploring how the brain changes after such workouts.

“Kids often have a very rich environment, so any brain training needs to be different from what they’re already experiencing, to elicit any kind of gain. The plus side is that their brains are very plastic so you can capitalise on that plasticity to try and change things for the better.

“When it comes to adults, the more we age, the more we become experts at what we do. While that makes our lives easier at work, we may not be challenging ourselves. What we know from the evidence is that brain challenges are unlikely to be a magic pill that works for you and for everyone else all the time.

“Your brain operates better with all the things we actually know about – a healthy blend of exercise, cognitive stimulations like challenges, and even a good social life. Sleep is very important, healthy foods, all those things. It’s about finding what works for you.”

He says there’s a popular perception that people only use about 20 percent of their brains but it’s difficult to prove that.

“We’re using our entire brains all the time. Sure, if you don’t get enough sleep your cognitive abilities decline quite drastically but it’s short-lived until you get better sleep.”

David says cognitive training, to improve a person’s working memory, can create benefits even for the elderly.

“There are lots of studies that have found it’s probably more effective in older adults, because their working memory may be declining and training can potentially slow that decline.

“If they’re in a retirement home, for example, the social environment might not be as stimulating or challenging as life was before, so they can really benefit from it.”

Mindfulness also seems to be a trend, and is really just good old-fashioned meditation.

“There are people who meditate just ten minutes a day, just like those high-intensity workouts we described, and get some benefits especially if they have a very stressful life. Like anything, if we want to see any kind of tangible cognitive benefits though, we may have to wait for a little while.

“In the Brain Dynamics Lab, we look at whether changes are the result of things we do naturally or as a result of interventions, such as interventional brain training exercises or mindfulness interventions.

“What we’re realising is there’s no generic intervention that works for everyone. Things need to be tailored to individuals because although we have a high degree of similarity, we’re also all very different from each other.”

■ Denise Montgomery

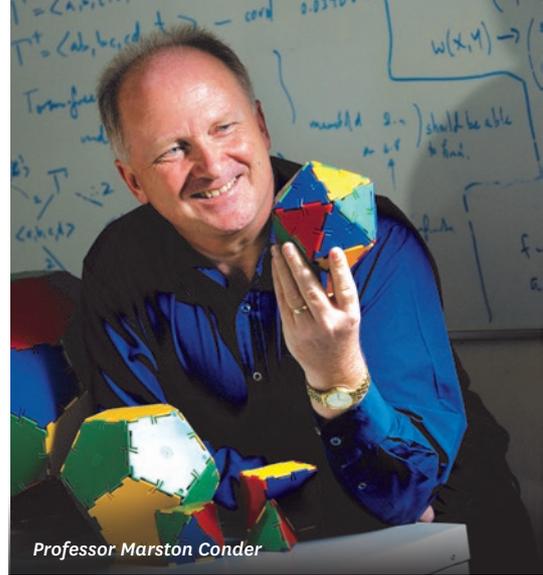
MATHS MEDAL ADDS UP

Professor Marston Conder has been awarded the prestigious Euler Medal for a distinguished lifetime career in an area of mathematics known as combinatorics.

Combinatorics is mainly about enumeration (or counting) of particular kinds of structures, as well as parts of applied maths and computer science known as discrete optimisation. It underlies the methods used in activities from the number squares in Sudoku puzzles to complex everyday tasks such as air-crew rostering and devising codes for telecommunications.

The medal was awarded by the Institute of Combinatorics and its Applications (ICA) which was founded in 1990 and is based in the United States. It is named after the Swiss mathematician Leonhard Euler who, in the 1800s, developed some of the foundations of combinatorics.

Marston’s work involves a mix of theoretical analysis, experimental computation and spotting and exploiting patterns in the results of his computations. There have been some cases where this approach has helped him find answers



Professor Marston Conder

to questions in other branches of mathematics.

“My research has been a lot of fun and it’s great to see some very clever younger colleagues coming through in mathematics,” says Marston.

Adapting a quote from Thomas Jefferson, he adds, “I’ve been very lucky many times in my career, but it seems that the harder I work, the luckier I get. I’m very grateful to the many people who helped me along the way, both personally and professionally.”

The medal was announced at a Combinatorics conference in the US in March and will be presented in person at a similar conference when air travel is easier.

INNOVATIVE ONLINE SUMMIT

The University will partner with Pennsylvania State University (Penn State) to host the Times Higher Education (THE) Innovation and Impact Summit from 19-22 April.

It’s the continuation of an existing strategic relationship with Penn State. The online summit will focus on the value of international research and collaboration and explore the critical ways research and academia are supporting global development. The 2021 THE University Impact Rankings will be announced during the conference. Auckland has been ranked first in the world in the two years since the ranking was launched in 2019. International Office director Brett Berquist says Auckland and Penn State have already co-funded joint research that can be accomplished through remote collaboration.

“Covid-19 exposed a critical need for institutions to develop effective models for virtual collaboration and experiential learning to promote global thinking,” he says. “The virtual THE Innovation & Impact Summit is a natural development of this,” he says.

■ Full story: auckland.ac.nz/innovation-summit
Updates and reports from the conference will appear on the staff intranet.

BRAIN SCANS YIELD CLUES

Dr Helen Murray’s expertise with the brain’s olfactory bulb is helping unravel the mysteries of Covid-19’s neurological effects.

The neuroscientist, a research fellow at the Centre for Brain Research, has been poring over scans of brain tissue from people who died from Covid-19. She is collaborating with scientists at the National Institutes of Health (NIH) in the US.

Around a third of hospitalised Covid-19 patients have neurological symptoms, including stroke and encephalitis. Working from home because of lockdown, Helen analysed brain scans sent to her in high-resolution, microscopic detail. What she saw surprised her. “It was striking. I’ve looked at tissue from Alzheimer’s patients for years now, but I have never seen changes as severe as these in the olfactory bulb.”

■ Full story: auckland.ac.nz/helen-murray-research



Dr Helen Murray



Professor Brian Boyd with the inaugural recipient of the Brian Boyd First in Family Scholarship, Michelle Prasad.

A BOOST WHEN THEY NEEDED IT

When Distinguished Professor Brian Boyd won the Rutherford Medal last November, the Royal Society Te Apārangi award came with \$100,000.

Brian, the world-leading scholar on Russian-American writer Vladimir Nabokov, decided he didn't need the money for his own research and that the funds were a chance to help someone else. The Brian Boyd First in Family Scholarship has been set up to help students who may be prevented from tertiary study because of their financial situation. The inaugural winner of \$8,000 a year for four years is 18-year-old Michelle Prasad, who came here from Fiji in 2018. In 2020 she was made head girl at Edgewater College in Pakuranga.

Brian says Michelle stood out. "As many have recognised, she does an astonishing amount for her community. And she has clear financial need and a background disability and family distress that she has turned into ability and positivity."

Michelle and her younger sister have been raised by their mother after her parents divorced and the family became estranged from her father. Michelle was born with a disability that meant she didn't speak until primary school but doesn't mind admitting she's made up for it since. "I'm enrolled in law and interested in politics so need to be able to communicate. I'll tell you now, I intend to be future prime minister of New Zealand!"

Michelle is doing a BCom/LLB. When she arrived in New Zealand she went straight from Year 10 in Fiji to Year 12 in New Zealand. "My New Zealand teachers saw something in me. My teachers in Fiji doubted me; one told me I'd never get anywhere. That just made me more determined."

Over summer, Michelle did a couple of law papers in the Summer Start programme so she could start the academic year well.

But she also got all the legal paperwork in place to set up her own foundation.

"At school I was friends with the head boy and he wasn't quite strong enough academically to get a scholarship to university. I thought to myself there must be something for people like him – to give them a hand to do other study, not necessarily university. Just to give them options."

Last November, she created the Good Start Foundation and sought donations on Facebook and Instagram and then got the foundation officially registered as a charity in February.

"I want to create opportunities for people like him who do so much in the community but don't have the financial means to study further."

Michelle is heavily involved in community and relishes the opportunities given her by her new home country. In 2020 she was Auckland Head Students committee leader, youth adviser to local government boards, United Nations Youth Ambassador at the UN Model Parliament, and Auckland and Multicultural Rep for Young Labour. She has also been involved in fundraising for charitable events.

Brian says he's extremely happy to be able to assist someone with her personal qualities.

"After reading what Michelle has done, and even more after meeting her and hearing what else she has done for others since submitting her application, I couldn't be happier with her getting the first award. She can go anywhere and she will give everything."

Another student whose life has been made easier through staff giving is George Leafa. George is the inaugural recipient of the Freshwater-Tyrrell Postgraduate Scholarship established in 2020 by Vice-Chancellor Professor Dawn Freshwater. George has a BSc in Psychology, a Postgraduate Diploma of Science in Psychology and a Masters in Psychology from Canterbury, and has now begun his Master of Nursing Science at Auckland.

"After my masters, I wanted a career in mental health and I was blessed with an opportunity to be employed in a medium-secure psychiatric and forensic service in Christchurch for two years. That made me decide to enrol in this two-year Masters in Nursing Science programme at Auckland."

Already laden with a student loan, he made the tough decision to leave Christchurch to follow his dream and to give back.

"Having the opportunity to further my education means so much to me. When I become a health professional, I'll have the honour of giving back to the community. Mental health is where my passion lies and I'm willing to go the extra distance so I can ultimately share my knowledge and life experiences with vulnerable people."

George is Samoan/Chinese and says he fell by the wayside at one point, growing up in Christchurch. He got in with the wrong crowd, but now sees that as part of his learning.

"We all face adversity and obstacles, but it's up to us whether we choose to take those lessons to better ourselves or make excuses. I have been through rough patches from a very young age, but I kept moving forward and learnt from my many mistakes. Over time, I matured and realised what kind of life I want to live. That is a successful life where I can take care of my loved ones and give back to my nations. Education has provided me with a safe zone to excel and opportunities to chase my goals."

He says the scholarship, which is worth \$15,000, relieves a lot of his financial burden.

"It means I can focus on my studies without the financial stresses and burden of trying to live a decent quality of life. I am so grateful for this support and I'm even more motivated to do well."

George has only been in Auckland for a couple of months but can already feel the benefits of living in the world's largest Polynesian city.

"Auckland has a lot more opportunities to offer and the large Pacific community motivates me to lead by example for our younger Pacific generation."

George is a talented sportsman, musician and artist so hopes to connect with people in those areas in any spare time he has.

"I'm looking forward to playing sports, music, meeting new people and exploring Auckland."

He also has advice for young Pacific students. "Don't beat yourself up if you fail something, because to be successful, we all must fail.

"Find a passion, generate some goals for yourself and put in the work. Surround yourself with quality people. If you feel like it's too much, just remember pain is temporary. Just keep moving forward."

■ If you're interested in contributing to scholarships, see giving.auckland.ac.nz



BRINGING COMEDY TO CHEMISTRY

Dr Joel Rindelaub is a chemical emissions researcher. Photos: Elise Manahan

The man described as “New Zealand’s newest science celebrity”, Dr Joel Rindelaub, wears the mantle with ease.

“The mullet, the moustache, the myth” proclaimed *The Spinoff*, although there isn’t a lot of myth to Dr Joel Rindelaub’s science.

It was his occasional not-so-scientific turn of phrase that got people talking when he appeared on TVNZ’s *Breakfast*. Discussing whether Covid-19 could be transmitted through a hotel’s ventilation system, he explained: “If you sneeze or you cough, you’re going to expel some gross droplets from your face hole, right?”

Joel and his ‘face hole’ interview went down a treat, if social media is the judge of anything. “I feel like I stepped back to Levin in the ’80s. That’s awesome,” tweeted one.

Joel has also been on RNZ talking about why masks should be used to cover that ‘face hole’. For that audience, he described the virus spreading through ‘the tiny droplets coming out of your mouth’ but threw in the word ‘spitball’ for good measure.

“I’m passionate about science communication so I adapt it for different audiences,” says Joel, a research fellow in the Faculty of Science. “Whether I’m doing chemistry demonstrations for primary school children, or talking about emissions with an older crowd, I try to fuel excitement in the kinds of things that we do at the University.”

Joel will have been in New Zealand four years on 15 April. He arrived on a working holiday visa, hoping to play a bit of ice hockey while here. Yes, ice hockey.

“There are five rep teams in the New Zealand Ice Hockey League, two in Auckland, one in Dunedin, one in Christchurch and one in Queenstown,” says Joel. “It’s a small community, but it’s very passionate.”

Joel played for the Botany Swarm at a rink in East Auckland and says the sport is popular amongst Canadian ex-pats. “So my accent has become more Canadian than Kiwi.”

That could also be something to do with where he’s from – Minnesota in northern US, on the border with Canada.

Anyway, he arrived to play ice hockey but had applied for the job at Auckland and secured it

once he was here. “You could say ice hockey brought me here, but science is definitely the reason I’m staying.”

There’s little doubt Joel is part showman. In high school he won the Triple A award: for arts, academics and athletics, demonstrating his ability in all. “Then I went to a small liberal arts university, Gustavus Adolphus College, in Minnesota. I wrote and performed in a play and also played ice hockey there. But I was a huge science nerd too.”

He settled into serious study, completing his PhD in chemistry at Purdue University.

“I worked in industry for two years and through that I realised my heart was definitely in academic research. I like learning and discovering and teaching.”

Chemistry is still at the heart of his research.

“Atmospheric chemistry, environmental chemistry and forensic science are my key focuses. I’m very interested in air quality.”

Recently, Joel highlighted the dangers of fireworks and his research was picked up by media.

“During Guy Fawke’s Day, it’s extremely common for people in New Zealand to light fireworks, randomly, in residential locations. They’re hanging onto sparklers in front of their faces. These have a high concentration of dangerous particles that you breathe in ... but people just don’t think about it.

“I’m not the fun police. I’m not saying, ‘take away all fireworks’, but as a scientist, it’s my job to present this information, so people can make an informed choice.”

He also created a comedic YouTube video to emphasise his point further.

Joel says New Zealand also has a problem when it comes to air quality.

In 2020, the government released a discussion document for its proposal to amend the National Environmental Standards for Air Quality (NESAQ), to address the size of particulate matter or PM. New Zealand’s air quality is strongly influenced by PM, which is measured in microns e.g. PM10, and smaller particles, PM2.5. The Cabinet paper says New Zealand is unusual in that the primary cause of particulate matter pollution is home heating in winter, followed by vehicle emissions, agricultural burning, industrial combustion and road dust. With home heating the dominant source of the pollution, 75 percent of New Zealand’s PM10 is actually the smaller unregulated PM2.5 particles.

In 2018 the estimated health effects attributable to PM2.5 particles were 646 premature adult deaths, 215 cardiac hospital admissions and 422 respiratory hospital admissions.

From 2014-16, 35 of 69 air-quality monitoring

sites exceeded the NESAQ standard for daily PM10. In towns such as Alexandra, Arrowtown and Cromwell, the standards were exceeded more than 40 times in 2014.

“New Zealand is a long way behind Europe, the US and even China in how we regulate

particulate

matter,” says

Joel. “The

smaller the

particle, the

more dangerous,

because it can go

deeper into your

lungs and cross into your bloodstream to your heart which pumps straight to your brain. That’s a risk factor for lung cancer and heart disease and it can affect cognitive ability as well.

“What the Ministry is proposing is to move from its current PM10 standard of 10 microns or less – that’s the diameter of the particle – and to finally regulate PM2.5. This is what all of the developed world did decades ago. The US did it in 1997, Europe around 2008, even China did it in 2013. This is how far behind New Zealand is.

“We just assume everything is pristine in this country which isn’t always the case. So we’re finally catching up to the rest of the world.”

He says the amendments to the regulations are expected sometime this year.

Joel is happy to talk about this to whoever needs to know and made a submission to the government on the proposed changes.

“Around 10 percent of my time is supposed to be focused on service so I definitely utilise that 10 percent because science communication is important. I started a YouTube channel over the first lockdown to try to convey science in a different manner. I try to communicate in a bit more of a light-hearted comedic fashion. It hasn’t really taken off, but it’s out there!”

Joel is also a freelance writer and used to write the science section in US pop culture magazine *Paste*. He recently had a piece in *The Spinoff* in which he clarified why the Covid-19 vaccine has been able to be developed quickly. It was written in response to a *Herald* article headlined: ‘Why I wouldn’t give son vaccine yet’ that questioned the safety of Covid-19 vaccines.

Joel responded: “In a piece that covers a significant breakthrough in science, you might expect to hear from an expert in the field, like a medical doctor or a PhD researcher. But not here. The only source was an accountant from Christchurch who was worried about the speed at which the vaccines were developed.”

Joel isn’t attacking people questioning the vaccine, but says scientists should have been called on to answer the questions.

“Money was the most significant factor that

led to being able to expedite these vaccines.

Scientists could start clinical trials as soon as they were ready and do parts of them simultaneously, simply because they didn’t have to worry about funding.

“It’s perfectly normal for people to have

questions, but

it’s our job as

scientists to

propagate this

knowledge,

rather than hide

it. I wanted to

correct that and

educate at the same time.”

Joel’s background is analytical chemistry and he “has a foot in the forensic programme too”.

“My projects try to marry forensic science, environmental chemistry and analytical chemistry. Every forensic scientist needs to understand analytical chemistry, which is basically how to measure chemicals. At a crime scene they need to understand exactly what’s there, on a molecular level. I teach some graduate level courses which are an introduction to forensic science, including environmental forensics.

“I also teach advanced analytical chemistry. The idea is to try to make classes fun and interesting so students are more engaged.

“Another of my interests is microplastics, not just in the air but in drinking water and various New Zealand beverages. And so, spoiler alert, yes they’re there, even in something like a takeaway container. There’s no such thing as microwave-safe plastics either, it’s just that some are better than others.”

He says science updates and amends information as it discovers more. An example might be that early in Covid-19 we were told the virus wasn’t airborne, then that it was.

“This is a completely novel virus, we knew virtually nothing about it. So, our knowledge is going to grow and change and that’s the beautiful thing about science. If we’re wrong

about something we correct it. It’s a constant learning process.”

He says the University is fortunate it has a number of people who excel in science communications.

“As well as Siouxsie Wiles and Shaun Hendy, who we’ve come to know through Covid, there’s Professor Richard Easter. I’m not a physicist, but he’s able to break down really complex astrophysics and make it more understandable. That’s a very underrated part of this University; that we have really smart people who are able to connect with different audiences.”

Back to the important stuff – the mullet, the moustache and the manner. Is this a look he fosters to reflect the comedic aspect of his personality?

“I’ve had a mullet on and off since high school. It’s been a full-time thing since 2013. In ice hockey they call it ‘the flow’ because it just comes out the back of the helmet ... and kind of waves like a cape. If you look at the 90s, it was a popular haircut for many professional ice hockey players. Then I got used to it, and now I just roll with it.”

Joel doesn’t have family here but his parents visited when that kind of thing was allowed and they love it here. He didn’t expect to be in New Zealand this long but has a contract until 2023.

“I enjoy New Zealand, I love to go tramping or just get out into the bush. I don’t mind being stuck here.”

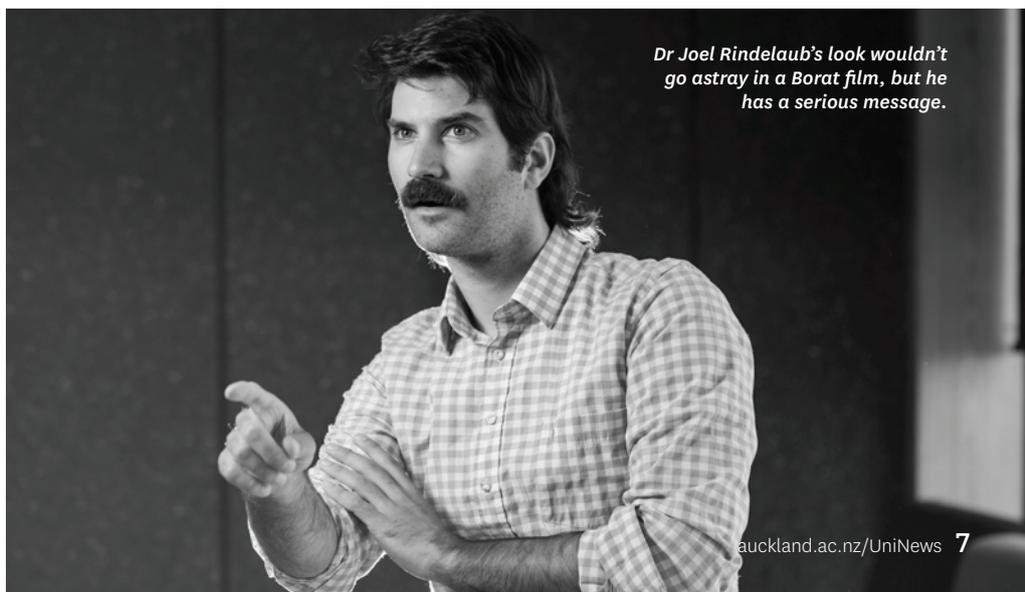
Asked if there’s anything else he wants to add, his message is simple: “Just that science is awesome.”

■ Denise Montgomery

See Joel’s Take 10: auckland.ac.nz/joel-take-10

Dr Joel Rindelaub will appear at the Raising the Bar event on 20 April. He will speak at Shadows Bar on Alfred Street at 8pm. See: rtbevent.com/auckland-21

Dr Joel Rindelaub’s look wouldn’t go astray in a Borat film, but he has a serious message.





**HOW SAFE IS VAPING?
THAT IS THE QUESTION**

Smoking has been around for a long time and we know the damage it causes. But we're yet to conduct conclusive research about vaping. That's the focus for senior research fellow Dr Kelly Burrowes for the next three years.

Photo: Elise Manahan

“Many people think, or have thought, that e-cigarettes are pretty safe, but that’s not known yet.” – Dr Kelly Burrowes, Auckland Bioengineering Institute

Dr Kelly Burrowes likes to keep busy but one hobby might have to go on the backburner.

Kelly has an online business she runs in her spare time in the evenings, while by day she's a senior research fellow at the Auckland Bioengineering Institute (ABI).

Kelly started her business during Covid-19. She sells products such as a fitness tracker worn as a necklace or bracelet, a device that measures how much breastmilk you're feeding your baby, pelvic floor devices and environmentally friendly menstrual products.

“I'm reading a lot about women's health and learning about running a business. I love learning. I also like making my own clothes and my own skincare products. I like creating things and understanding how things work.

“Like many academics, I'm always on fixed-term contracts and I'd thought 'well, what if I don't get a new contract? I needed a plan B, so the online business was my plan B.”

Kelly had begun the business before she knew she'd been awarded a Marsden Grant to develop her important research into e-cigarettes. Work began on the Marsden Grant research on 1 March.

“So it looks like my hobby will now be just an hour in the evening,” she laughs.

She is also the mother of an eight-year-old and six-year-old twins. She and her husband, who is from the UK, returned to New Zealand from England when Kelly was expecting the twins. She had been working at Oxford University in computational research for around a decade.

Kelly's focus since 2001 is bioengineering research centred on creating patient-based computational models of the respiratory system. While a lot of that focuses on diseases such as lung cancer and chronic obstructive pulmonary disease, in recent years she has been interested in smoking cessation and the impact of vaping on the lungs.

The Marsden Grant aims to answer questions around any health impacts of vaping compared to smoking regular cigarettes. Kelly will develop a framework that integrates various data, including analysing what goes into electronic cigarette aerosols, where the aerosol travels to in the body and its effect on cells and organs. This will be done using state-of-the-art imaging techniques.

The research runs for three years and the \$900,000 funding means Kelly has been able to

employ two masters students, and is trying to get two PhD students.

She has one PhD student already who can do the work, but the student can't get into New Zealand due to Covid-19 border restrictions.

"It's so hard to find students now because a lot of them would previously come from overseas."

The students need to be in New Zealand because the research involves experimental work. The study will also involve a postdoctoral researcher for one year.

There are three associate investigators involved, Professor Merryn Tawhai, deputy director of the ABI, Dr Vinod Suresh, senior lecturer in engineering science at the ABI, and Professor Chris Bullen from the School of Population Health.

"The Marsden allows us to gather research about e-cigarettes and tie it all together.

My expertise is in computational modelling, although for my undergraduate degree I studied chemical and materials engineering. But I always wanted to get into some sort of biological health research, and that's where I have ended up.

"The first part of our research is chemical analysis – looking at what's in e-cigarette

The Marsden project wants to establish relative harm – how e-cigarettes compare to regular cigarettes – but also look at any harm created in people who have never smoked.

"Many people think, or have thought, that e-cigarettes are pretty safe, but that's not known yet," says Kelly.

She also has a personal stake in knowing. Her husband is a former smoker who has tried a number of quit methods and now vapes.

"He was in the Royal Air Force and smoking was a common habit. I said, 'I can't be with someone who's a smoker!' He gave up, using gum and patches, but now is vaping. Hopefully one day he can stop. It's a battle for a lot of people so this research is important for society."

It stands to reason that at least some harm must come from vaping.

"My hypothesis is that vaping causes inflammation," says Kelly. "Anything you breathe into your lungs that's not just clean air is going to create some inflammatory response, because that's your body's normal response to any sort of foreign body.

"If you have repeated inflammation, that's when you start to get problems and there are

why there is quite a high mortality rate for patients after being ventilated."

Kelly has recently been appointed chair of Women in HealthTech, a network to support women and diversity in the medtech sector. It is a collaboration of Medical Technology Association NZ, NZ Health IT and CMDT/MedTech CoRE.

She believes a contributing factor to her own path into science came from having attended a girls' school.

"I did three sciences and two maths in my last year of school. There's literature to show that girls give up maths and physics because those classes are male dominated. I often wonder if I would have ended up doing the same thing if I'd been in a co-ed school."

Kelly, Merryn Tawhai and Alys Clark are some of the better-known women scientists at the ABI.

In general, women appear to be more attracted to bioengineering and environmental engineering than other engineering fields.

"I've read a bit about this and there are theories that it's because of that innate nurturing and caring aspect, as well as wanting to make a difference."

But there's still work to be done on women climbing engineering's echelons, even in bioengineering.

"There are quite a few females at the ABI but as you rise through the ranks there are fewer and fewer women who are senior staff. I don't necessarily know why that is, but for me it's because of needing to juggle parenting with my career."

She says change takes time.

"Around 50 percent of our students in undergraduate biomedical engineering courses are women ... that's a good start."

■ Denise Montgomery

Kelly will speak about her Marsden Grant research and the ABI at Raising the Bar on 20 April, at 6.30pm at Revelry, 106 Ponsonby Road. If not in Level 1, the event will be held online. See: rtbevent.com/Auckland-21

■ See Kelly's FemTech products at thefemtechrevolution.com

VOLUNTEERS SOUGHT

Dr Kelly Burrowes needs 20 healthy young volunteers who are already vaping and are prepared to have an MRI and their lung function tested.

Email: k.burrowes@auckland.ac.nz

***"Anything you breathe into your lungs that's not just clean air is going to create some inflammatory response, because that's your body's normal response to any foreign body."* – Dr Kelly Burrowes**

aerosol and measuring the size of the particles or droplets in the vapour. Then we'll use our computer models to simulate where those particles go, in a realistic-looking lung. And then with Vinod, we'll be doing some cell experiments exposing lung cells that we grow in the lab to those e-cigarette aerosols and we'll look at how they change after they've been exposed."

The third area will involve magnetic resonance imaging (MRI).

"We will look at the lung before and after a person uses their vape, so we can measure the regional air flow, blood flow and tissue density.

"In the tissue of smokers who don't have health issues, density is known to be a bit higher – thought to be because of increased inflammation. So this research will see if there are similar things going on in vapers' lungs."

Kelly says research often looks at just one aspect – chemicals, cells or how the lung works as a whole.

"At ABI we're good at modelling so the goal is to use our models to bring all these measurements together, right from the cell level up."

changes to how the cells are working. I just want to establish if that's the case with vaping and what happens to the lungs."

She says there are many different types of e-cigarette and liquid used in them, so the researchers will choose typical devices.

"We're going to start with those open-tank type devices, mostly because they create a big cloud of aerosol. We need to be able to collect the aerosol for our analysis."

Kelly says this research, like all at the ABI, aims to have a real impact on society.

For example, she's working on another project, with Merryn and others, to develop a new device to measure airflow in patients who are ventilated, crucial research in these Covid-19 times.

"It's an electrical device to measure airflow in the lungs in these patients. It will be useful for patients to see how the lungs are performing when they're ventilated.

"There's a very fine balance between not enough airflow and too much while a person is on a ventilator. If you inflate too much, that stretches the lungs and damages them. That's

ART & CULTURE

HOPES FOR POLYFEST TO RETURN TO JOY

The ASB Polyfest Auckland Secondary Schools Māori and Pacific Islands Cultural Festival runs from 14-17 April at the Manukau Sports Bowl and organisers are hoping it's third year lucky.

The 2019 event was curtailed because of the Christchurch Mosque massacre and the 2020 event canned because of Covid-19. Aply, the theme for 2021, the 45th anniversary of the popular event, is 'Mā roto mai i te Ahurea whirikoka, ko te whakaora tinana, hinengaro, wairua me te ira tangata': 'Healing the body, mind, spirit and soul with the strength of culture'.

The University has been a sponsor of Polyfest since 2015 and is the platinum sponsor of the Samoan stage. We produce an alumni wall that goes up around the inside of the Samoan marquee, which holds information about our Pacific staff, students and alumni.



Rennie Atfield-Douglas in the Samoan marquee where a visitor tries out the virtual reality experience.

Rennie Atfield-Douglas, director of Te Papa Ako o Tai Tonga, the South Auckland Campus, says our relationship with the event is important.

"Polyfest is an integral part of the school calendar year and the community always looks forward to it. It's always really inspiring and exciting to see the students perform on stage for their families and the wider community."

Around 30 schools are expected to participate in the ASB Polyfest over the four days.

■ See asbpolyfest.co.nz



SCHOLARS HONoured

Six staff have been elected as honorary fellows to the Royal Society Te Apārangi. Among them is Creative Arts and Industries' Professor Deidre Brown (Ngāpuhi, Ngāti Kahu), who is the only one of the current 455 fellows with an architecture and art history background. Deidre is recognised internationally as a scholar of Māori and Pacific art history, cultural property rights and Indigenous digital humanities. She was one of the first researchers to develop scholarship and kaupapa Māori methodology for investigating Indigenous digital culture. Other staff named were: Professor Andrew Hill, assistant dean in the Department of Surgery at the South Auckland Clinical Campus, FMHS; Robin Kearns, Professor of Geography, Faculty of Science; Janet McLean QC, Professor of Law; Professor Julian Paton, director of Manaaki Mānawa, the Centre for Heart Research; and Toeolesulusulu Damon Salesa, Associate Professor of Pacific Studies and Pro Vice-Chancellor (Pacific). The new fellows will be formally inducted in Wellington on 29 April. Full story: auckland.ac.nz/2021-royal-society



WE'RE INVITED TO UNINVITED

The University of Auckland has partnered with Q Theatre (305 Queen Street) for its Summer at Q series of events.

The University is the sole sponsor of Summer at Q, a programme predominantly serving the Rainbow and fringe community and audiences.

With the lockdowns, some of the events were

postponed from February. One of those is the play *Over My Dead Body: Uninvited* directed by Jason Te Mete (Ngāti Ranganui) which runs from 14-17 April at 9pm. On 15 April it will be introduced by Dr Terry O'Neill, director of Student Equity, and the acting Pro Vice-Chancellor (Equity), Prue Toft.

Uninvited is one play in the *Over My Dead Body* series and aims to educate audiences about Aotearoa's HIV/AIDS history.

■ Get tickets: qtheatre.co.nz/overmydeadbodyUNINVITED

BOOKS

Cold Wallet:

Locked, Loaded, Gone

Cold Wallet is a thriller by alumna Rosy Fenwicke, set in Auckland, Fiji and Corfu and in the world of cryptocurrency.

The last words Andrew said to Jess just before he died on their honeymoon were, "You have kind eyes". Grief stricken, she returns to New Zealand and to the cryptocurrency exchange he left her in his will. Knowing nothing about cryptocurrency, physician Jess turns to Andrew's associate, Henry, someone she has never liked, for advice.

Cold Wallet: Locked, Loaded, Gone, Rosy Fenwicke, \$36, and e-book on Amazon

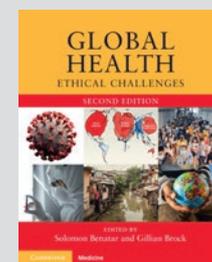
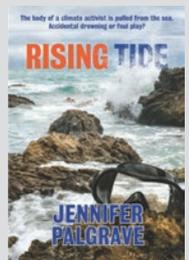


Rising Tide

Lois Cox and Dr Hilary Lapsley (Faculty of Arts) are the writing partnership known as Jennifer Palgrave. Their new book is the story of Nat Spiller, a climate change activist, who drowns. An accident?

Or something more sinister?

Rising Tide, Jennifer Palgrave, Town Belt Press, \$30. Order: townbeltpress@xtra.co.nz



Global Health: Ethical Challenges

Professor Gillian Brock (Philosophy) co-edits a collection of essays addressing ethical challenges posed in global health. This volume

includes multi-disciplinary analysis and practical recommendations to promote health in the face of planetary challenges, including infectious diseases such as Covid-19. Gillian also recently published another book, *Migration and Political Theory* (Polity Books, US\$22.95) exploring the ethics of migration and movement in the 21st century.

Global Health: Ethical Challenges, Solomon Benatar and Gillian Brock (eds), Cambridge University Press, US\$65

A WEEK OF CREATIVITY

World Creativity and Innovation Week (WCiW), is 15-21 April. The Centre for Arts and Social Transformation is leading the University's contribution to this international showcase, highlighting how and why creativity is important, particularly in relation to the Sustainable Development Goals.

See: wcw.org/celebrations/new-zealand/



AUCKLAND'S STORIES

Tāmaki Herenga Waka: Stories of Auckland has opened at the Auckland War Memorial Museum.

The permanent suite of galleries shares stories of the people and place that is Tāmaki Makaurau.

Stories of Auckland are shared through more than 500 objects on display and enhanced with digital experiences, including 25 films especially developed to celebrate the Auckland region. Tāmaki Herenga Waka is divided into seven sections across four gallery spaces.

Part of the project is called Eyes on Tāmaki and is an interactive experience developed with staff from the University including Dr Danielle Lottridge (Computer Science) and Dr Ethan Plaut (Digital Communication, Arts). Their topic is data surveillance and privacy, and Eyes on Tāmaki will provoke visitors to think about the flipside of the data they've been viewing in the rest of the room.

■ Read about it: tinyurl.com/AKMuseum-Auckland



Professor Alison Jones

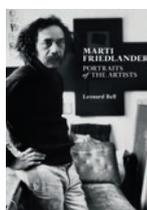
STAFF MAKE BOOK AWARDS SHORTLIST

Three books by University of Auckland staff have made the shortlist for the Ockham New Zealand Book Awards.

This Pākehā Life: an Unsettled Memoir (BWB) by Professor Alison Jones and *Te Hāhi Mihinare The Māori Anglican Church* (BWB) by Dr Hirini Kaa are both finalists in the General Non-Fiction category. *Marti Friedlander: Portraits of the Artists* (AUP) by Associate Professor Leonard Bell is a finalist in the Illustrated Non-Fiction category.

The winners will be announced on 12 May.

■ Read more: auckland.ac.nz/ockham-shortlist



MĀRAMATANGA

VALUE IN ALL THAT IS AOTEAROA

What can we do to value mātauranga Māori in academic institutions, asks Professor Linda Waimarie Nikora.

Our business is to grow graduates to produce knowledge and create a more promising future for themselves and the world. We're living through an epoch of change – of chaos and riotous colour in terms of diversity and the challenges in front of us. It's the ideal time to change the way we do things. If we don't, we risk becoming irrelevant. The pandemic required us to change rapidly and has also presented opportunities to improve the way universities operate.

If we look at the way in which our institutions work, particularly around the recruitment of staff, we tend to privilege the applicant with international experience and undervalue the applicant with local experience. What does this tell our brilliant graduates?

We need to value what we produce here in Aotearoa. University rankings are important and serve a purpose, but what greater dimensions would we achieve if we recognised the depth of knowledge instilled by mātauranga Māori? After all, it is not found anywhere else in the world.

I have co-edited a book with Professor Jacinta Ruru (University of Otago) called *Ngā Kete Mātauranga: Māori Scholars at the Research Interface*. In it, 24 Māori academics, myself included, share their personal academic journeys and what being Māori has meant in their academic work. When you consider the Māori academic, you're not just looking at the hopes and inspiration of one person, you're taking into account the hopes and inspirations of many people, communities and ancestors.

The following is an excerpt from my chapter, entitled 'Growing Up in Psychology'.

Psychology and its advanced practitioners have knowledge and skills to cause miraculous changes in people's lives, within whānau and communities. They can, and do, work magic. I am a fervent believer in the good that my discipline can and does do, yet I believe it can do much, much more.

Teaching mātauranga Māori in psychology remains a challenge. It depends on the appointment of Māori academics into full-time research and teaching positions. I have always asserted that research and teaching have to go hand-in-hand. You cannot have one without the other. I protest the recent pattern of appointing Māori with PhDs in any discipline into teaching-only positions when institutions have the facility to appoint them into entry-level lecturing positions. This seems suspiciously like a double standard and is a result of institutions neglecting to train the type

“Teaching mātauranga Māori in psychology remains a challenge.”

Professor Linda Waimarie Nikora
Photo: Grant Maiden

of candidates they are seeking, that is, candidates experienced in mātauranga Māori! Tērā tērā.

Many of my colleagues in psychology have the luxury of access to ready-made textbooks, with ready-made lectures, tutorials, assessment exercises and tests. Mātauranga Māori-informed psychology, even with the aforementioned explosion in research activity, still remains in its infancy with much, much more remaining to be achieved. There is also the challenge of negotiating space within the curriculum to present mātauranga Māori material to students. With a large and diverse discipline, only a small amount of content can be given airtime. Having sat through a number of curriculum review processes, one begins to recognise patterns in the arguments that are brought to the table. I note some of these below with some brief replies.

There is a core curriculum students should learn and this should be benchmarked against those curricula taught in leading institutions around the world. **My reply:** This does not contribute to a decolonised, relevant and responsive discipline for us here in Aotearoa New Zealand. It simply perpetuates the colonial status quo and those biases that stem from foundations built on false Western-world assumptions.

Students need fluency in the dominant positivist empirical paradigm. **My reply:** The positivist empirical paradigm is simply one of many. Students need to learn about a range of different ways of being in the world.

We cannot use textbooks that we author ourselves as this creates an unjust monopoly and is exploitative of students. **My reply:** There are not many academics able to author mātauranga Māori-informed psychological textbooks. While this argument may be valid in other countries, any peer-reviewed psychological text written by New Zealand academics should be welcomed and celebrated. I do recall Professor James Ritchie setting his own book *Becoming Bicultural* as a textbook, and others that he co-authored

with Professor Jane Ritchie. I didn't hear any complaints about them.

We cannot be too critical of psychology as this just confuses students. **My reply:** As academics, our positions require us to be critical and to reflect this in our teaching. Students deserve fair and insightful evaluations of the knowledge we communicate. Asserting or taking for granted that there is only one psychology in the world, that is, Western psychology, supports and perpetuates a colonial hegemony, and denies Māori and Indigenous knowledge paradigms and voices.

We have to look like a science subject otherwise we will lose our science funding. **My reply:** Our discipline is a producer of knowledge and we do so in a range of ways employing many diverse methods beyond empirical methods. Psychology has to own up to this reality and be comfortable doing so.

I work in a Western academic institution. It is not a whare wānanga of old, or for that matter, of new. Universities are places of learning, but of certain forms of knowledge. I revel in the spectrum of knowledge I am exposed to every day, and yet often mourn the absence of Māori knowledge and weep at the barriers yet to be overcome. Those Māori and Indigenous peoples who pursue careers in the academy with a goal of making a difference to the lives of 'our' peoples will face bigotry, arrogance, racism, exclusion and marginalisation. This is not because we work with bad people, we simply work with people trained in a particular way of knowing and seeing. This way creates inherent biases in all aspects of our institutions and we disturb these biases through our mere presence.

■ Linda Waimarie Nikora (Tūhoe, Te Aitanga-a-Hauiti) is Professor of Indigenous Studies and co-director of Ngā Pae o te Māramatanga.

Ngā Kete Mātauranga: Māori Scholars at the Research Interface, Otago University Press, \$60

The views in this article reflect personal opinion and are not necessarily those of the University of Auckland.