

Te Pūnaha Matatini

Complexity is at our heart

Annual Report 2021



Īhahā!

Ko te reo o Te Pūnaha Matatini e tūpapahū nei
Ki Te Ōwī, ki Te Ōwā –
Ka haruru; ka ngatoro;
He oro tī! He oro tā!
He oro kōkō e pāoro nei
Ki runga ki ngā iwi
O te motu whānui, o te ao nui tonu.

He kōingo ki te pono, he minaka ki te tika,
He karanga ki te rangahau; he raranga i te hauhū.
Te ngākau o Te Iti kia ngiha;
Te mahara o Te Rahi me mura –
“Ko te mauri o te raraunga ko ngā kōrero i tuku iho!”

Tihei Mauri Ora!

The voice of 'Te Pūnaha Matatini' resounds
Across the peaks of Te Owi and Te Owa
Reverberating, broadcasting, echoing near and far
A sweet voice indeed, playing amongst the people
Of this land, across the globe.

Desirous of the truth, of justice
Calling for research, weaving the findings
That will light up the hearts of the humble
That will bring a fire to the minds of the proud –
“Stories are data with soul!”

Tihei Mauri Ora!

A Centre of Research Excellence hosted by the University of Auckland



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This report covers the six-month period from 1 July 2021 to 31 December 2021



About us



Complexity is at our heart

**We build community across disciplines
to solve complex problems.**

Te Pūnaha Matatini – the meeting place of many faces – is the Aotearoa New Zealand Centre of Research Excellence for complex systems. We are funded by the Tertiary Education Commission and hosted by the University of Auckland. We bring together researchers from tertiary institutions, government institutes, private sector organisations and marae communities from throughout Aotearoa New Zealand.

We apply inter- and transdisciplinary approaches to address the most complex and critical issues of our time.

Our strategy is to transform the research system in Aotearoa New Zealand by embedding a strong foundation of values that permeates the work that we do on complex systems. We train ethical, collaborative researchers that work with complex data across diverse sectors.

Te Pūnaha Matatini provides a safe place for researchers to grow and develop.

Ko te matatini-tanga hei iho

Ko tā mātou he whakatupu hapori i ngā pekanga mātauranga hei rongoa i ngā raru matatini.

Ko Te Pūnaha Matatini, arā, ko te kāpunipunitanga o ngā tini mata – ko te whare o te rangahau kounga o Aotearoa mō ngā pūnaha matatini. He mea tautoko mātou, ā-pūtea nei, e Te Amorangi Mātauranga Matua, he mea whakaruruhau anō hoki e Waipapa Taumata Rau. Ko tā mātou he whakakotahi mai i ngā kairangahau nō ngā whare wānanga, nō ngā tari kāwanatanga, nō ngā whaka-haere nō te rāngai tūmataiti, nō ngā hapori nō ngā marae puta noa i Aotearoa anō hoki.

Ka whāia e mātou ngā ara mahi ngātahi, whakawhitiwhiti anō hoki i waenga i ngā pekanga mātauranga, kia aro atu ai ki ngā take matatini katoa, ki ngā take whai tikanga katoa hoki o te wā.

Ko tā mātou rautaki ko te panoni i te pūnaha rangahau i Aotearoa mā te whakaū i ētahi uaratanga pakari hei tūāpapa mō ā mātou mahi e hāngai ana ki ngā pūnaha matatini. Ka whakangungua e mātou he kairangahau matatika, e waia ana ki te mahi tahi, ka mahi hoki ki ngā momo raraunga matatini puta noa i ngā rāngai kanorau.

Ko tā Te Pūnaha Matatini he whakarite kāinga haumaruru e whanake ai a ngāi kairangahau.

Our values

Manaakitanga

Reciprocal care for others and recognition and return of mana in relationships

Tika

Doing the right and proper thing

Tapu

Ethical behaviour that acknowledges the intrinsic and sacred value of each and every person and thing

Pono

Truth, genuineness and ethical behaviours

Te kawau mārō

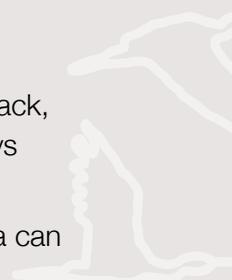
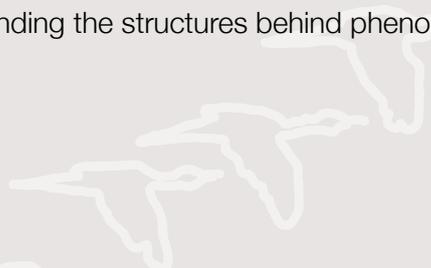


Complexity science enables new ways of seeing and understanding the world.

When birds flock for flight, they move from an individual state to a highly ordered structure that enables them to move together, aiding their collective journey. The kawau, or shag, extends its neck as it prepares to dive. Maniapoto's military strategy — te kawau mārō — is based on coordinated collective action that punches through existing barriers to create beneficial new outcomes.

In reducing the world to its constituent parts, the traditional frameworks of our universities and national research institutes fail to describe how people, the economy, and the environment can, do and must relate to each other. The key features of complexity science — connections, feedback, attractors, intervention points, critical transitions, and emergence — all offer new, innovative ways of tackling societal problems.

The flight of the kawau reveals how seeing and understanding the structures behind phenomena can bring unexpected insights.



Kia mau ki tēnā

Kia mau ki te kawau mārō

Whanake ake! Whanake ake!

Stick to that, the straight-flying cormorant!

– Maniapoto

Mā te rangahau matatini e hua ai he tirohanga hou, he māramatanga hou anō ki te ao.

Ka apū haere ana te rere a te manu, ka huri te āhua o te whakarite - nāwai i takitahi te āhua, ka kuhu kē ki tētahi rāngai kua āta whakaraupapatia, e tapatahi ai te rere, e ngāwari ake anō ai te haere ngātahi. Ka whātaimai te kawau, nōna e whakarite ana ki te ruku. Hei tūāpapa mō te rautaki pakanga a Maniapoto ko te koke ngātahi kia turakina ai ngā tauārai, e puta ai ko ētahi painga hou e whaihua ana.

I te āhua o te āta wāwāhitia o te ao hei wāhi motuhake, kāore e oti i ngā anga whakahaere auraki o ō tātou whare wānanga me ngā whare rangahau ā-motu te āta whakaahua i te āhua e honohono nei te tangata, te ōhanga me te taiao ki a rātou anō, me te tika o te pērā. Ko ngā āhuatanga matua o te pūtaiao matatini - arā, ko ngā hononga, ngā whakahokinga, ngā wāhi whārite, ngā wāhi panoni, ngā whakawhitinga whai tikanga nui, me te mahi ngātahi – hei huarahi hou, hei huarahi auaha anō hei rongoā i ngā raru ā-pāpori.

Ko tā te rere a te kawau e whakatauiria mai ana, mā te aro, mā te whai māramatanga anō ki te hanga o tētahi momo āhuatanga, e kitea ai pea he māramatanga kāore i whakapaetia.



Director's report

Kia mau ki tēnā, kia mau ki te kawau mārō

Hold fast to that, hold fast to the swoop of the shag

Te kanohi hou, the new face of Te Pūnaha Matatini is emerging, and it has been my privilege to lead in this period of transition. Te Pūnaha Matatini 2.0 – the kawau – spread its wings on 1 July 2021.

In our first six months, Te Pūnaha Matatini has launched a suite of new core research projects that draw from our strengths in complex systems and interdisciplinary research.

The emergence of Te Pūnaha Matatini 2.0 during the second half of 2021 has been challenging. The Covid-19 pandemic continues to affect whānau, communities, institutions, societies, economies and biodiversity worldwide.

Many have stepped up to lead. In true Te Pūnaha Matatini fashion, this commitment to serve Aotearoa New Zealand has led to a new spinoff entity, Covid-19 Modelling Aotearoa, that is focused entirely on Covid-19 research.

Deputy Director Dr Michael O'Sullivan and I have been supported by a wealth of inspiring leaders from the Communities of Inquiry in this early stage of development. We have embedded new processes for transparency in our leadership and funding decisions, and opened up more opportunities for our early career researchers in TPM Whānau to get involved with our mahi.

Our kaupapa has expanded to focus on the development and mentoring of students who are collaborative, ethical and responsive to their partner communities and stakeholders, as well as being skilled in data analysis. Our investigator cohort contains both old faces and new, with a wider variety of disciplines and skillsets than ever before, but with the common thread of joy in research and collaboration.

We have worked with Kaumātua Associate Professor Tom Roa and others to weave a strong foundation of values for our mahi in these testing times. I look forward to the collective strength of Te Pūnaha Matatini as we address the coming challenges.

Ngā manaakitanga,

Associate Professor Priscilla Wehi
Director, Te Pūnaha Matatini



Board Chair's report

Welcome to the first report of the newly configured Te Pūnaha Matatini. If anyone was arranging a six month period for launching 'Te Pūnaha Matatini 2.0' they wouldn't have chosen this one!

The work covered in this report was significantly affected by Covid-19 lockdowns, particularly in Auckland. For this reason I would like to thank the whole Te Pūnaha Matatini team for the progress they have made. It is an example of what can be achieved by a united Te Pūnaha Matatini team and good leadership.

Te Pūnaha Matatini has become well known as a result of its Covid-19 modelling work over the course of the pandemic, but it is now time to focus on the other important activities of this Centre of Research Excellence. To this end, Covid-19 Modelling Aotearoa has been set up to focus on Covid-19 research, and is now separate from Te Pūnaha Matatini.

Te Pūnaha Matatini now has three Communities of Inquiry: Complexity, Engagement, and Culture of Research Excellence. It is very pleasing to see the progress made by these Communities of Inquiry under difficult circumstances.

TPM Whānau continues on strongly as before, and I thank the outgoing chair Giorgia Vattiato for her report and leadership of the Whānau in 2021. The awards, grants and recognitions covered in this report describe the continuing success of our investigators and are an indication that Te Pūnaha Matatini is building a foundation for a successful future.

I would also like to acknowledge the critical contribution made by our headquarters team, led by Kathryn Morgan and ably assisted by Pauline Donougher, who do so much work behind the scenes. The transition would not have been so seamless without their efforts. Finally I would like to thank all members of the Advisory Board for their contribution and assistance over this period.

Richard Aitken
Director, Transpower Limited
Advisory Board Chair, Te Pūnaha Matatini

Communities of Inquiry

Communities of Inquiry (COI) are the central threads that weave through all the work we do at Te Pūnaha Matatini.

Our three COIs provide leadership and community around key practices that are fundamental for research at Te Pūnaha Matatini. They weave people and knowledges together, lead by example, and create space for bold and transformative ideas to grow.



Complexity COI

The Complexity COI provides leadership in the development and application of complex systems methods. It aims to empower investigators and students to work collaboratively and ethically on big data, including national databases, and the modelling and analysis of complex systems in a diverse range of applications and contexts.

Leadership:

- Associate Professor Ilze Ziedins
- Professor Michael Plank
- Dr Matthew Parry

Culture of Research Excellence COI

The Culture of Research Excellence COI grows a culture of research grounded in Te Tiriti, partnerships, multidisciplinary, theoretical rigour, and equitable outcomes by developing research teams that are able to nurture and innovate ideas from inception to publication. Providing a meeting point for a range of methodologies, and drawing from kindness in science in particular, we lead the transformation of research both within and outside of Te Pūnaha Matatini.

Leadership:

- Associate Professor Krushil Watene
- Associate Professor Tammy Steeves

Engagement COI

The Engagement COI is an opportunity for anyone involved in Te Pūnaha Matatini to connect with others who are interested in communication and engagement – be that sharing experiences, learning new skills, getting involved in hands-on activities, developing new ideas or simply meeting like-minded people. Supported by a vibrant core of Te Pūnaha Matatini energy, we also hope to enable those who want to become champions, knowledge-holders and agents for engagement activities within their own Te Pūnaha Matatini projects, research groups and home institutions.

Leadership:

- Associate Professor Rhian Salmon
- Dr Dan Hikuroa
- Associate Professor Siouxsie Wiles

Engagement Incubator

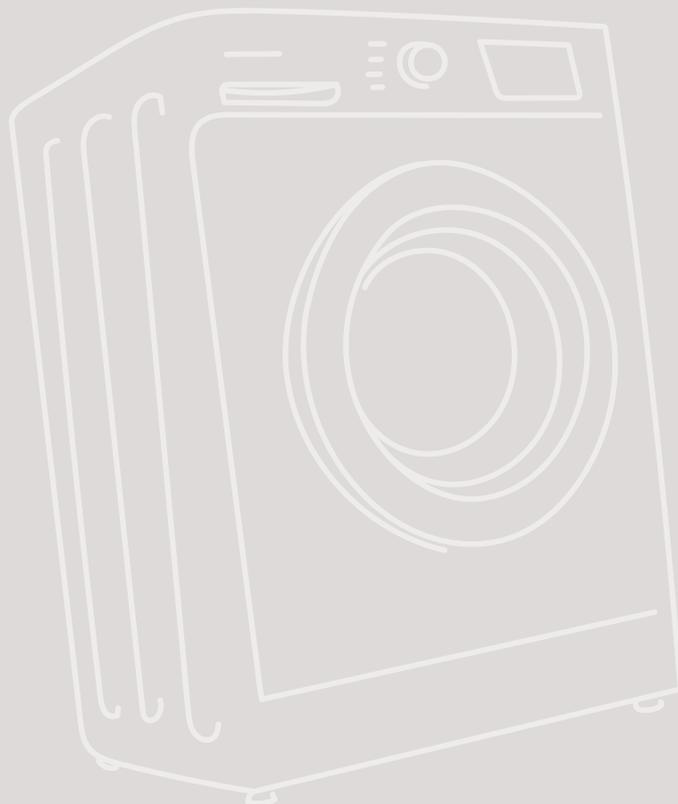
The Engagement Incubator is a key part of the structure of Te Pūnaha Matatini that supports researchers to embed engagement from the start of their projects.

The Engagement Incubator:

- Develops pathways that enable Te Pūnaha Matatini researchers and research projects to be engaged with the ethical, socio-political, cultural, economic, and environmental contexts of the proposed research, and appropriate tools for respectful engagement with Te Tiriti o Waitangi partners, communities, and stakeholders.
- Creates opportunities for stimulating ideas and providing training in research engagement and impact, including engagement to inform policy-making and engagement with communities.
- Provides a safe space to interrogate and catalyse critical conversations about the practice of research, including topics such as data ethics, open science, engagement with Māori and Pacific communities, and being self-critical about equity, diversity, inclusion and access in our workplaces.

People:

- Associate Professor Rhian Salmon
- Jo Bailey



The Observatory

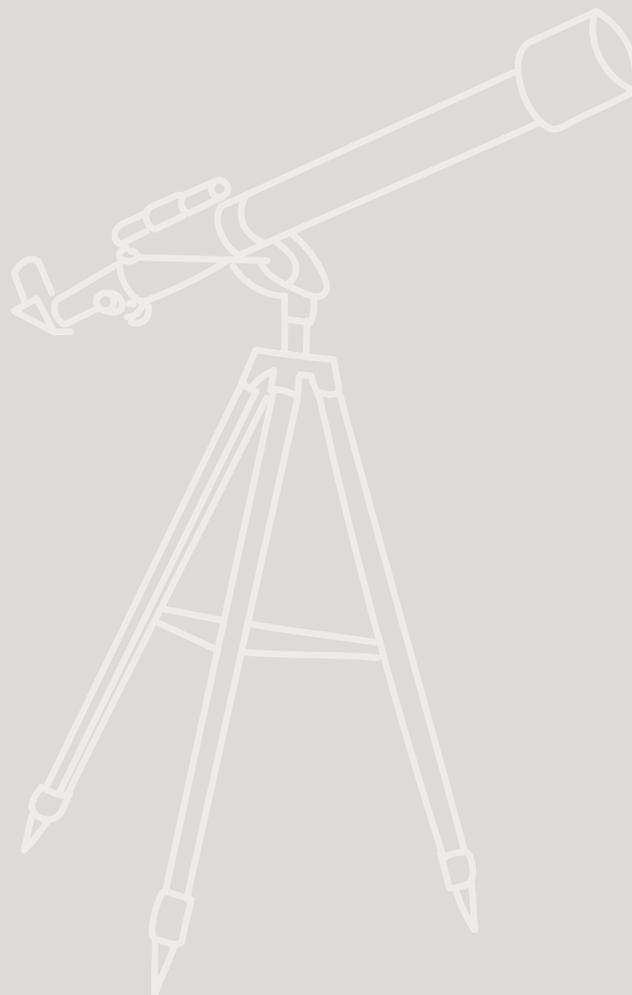
The Observatory is a small yet pivotal feature of the structure of Te Pūnaha Matatini that finds ‘explosive’ issues growing toward tipping points where Te Pūnaha Matatini can shape positive transformation.

Aotearoa New Zealand, and the world, face critical challenges which are interconnected and complex. Best practice decision-making relies on responsive, reflexive, contextualised and relevant evidence-based research which is accessible to all decision-makers.

The Observatory scans the horizon and gathers information about new and upcoming likely intervention points with a focus on emerging issues for Aotearoa New Zealand where complex systems research can create meaningful impact.

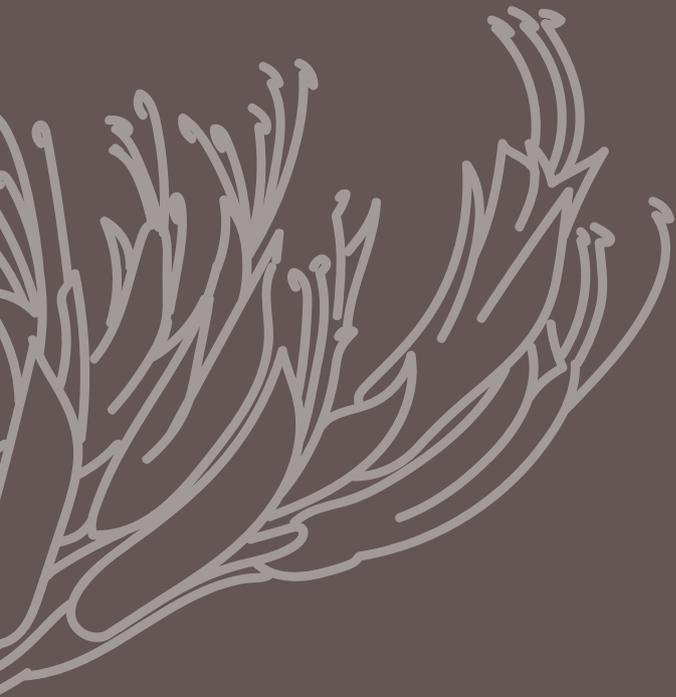
People:

– Professor Troy Baisden





Our research



Our projects



Te ara o te reo Māori The trajectory of the Maōri language

Collating, analysing and transforming data on te reo Māori into an assessment of the current and future trajectory of the language.

- Dr Rachael Ka'ai-Mahuta (Project Co-lead)
- Professor Michael Plank (Project Co-lead)
- Professor Alex James
- Professor Murray Cox



Ngā ara hou ki te ora New pathways to wellbeing

Modelling healthcare delivery and optimising for wellbeing, justice, equity and efficiency.

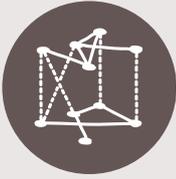
- Associate Professor Ilze Ziedins (Project Lead)
- Associate Professor Krushil Watene
- Associate Professor Cameron Walker
- Dr Marama Muru-Lanning
- Dr Michael O'Sullivan
- Professor Tava Olsen



Science, statistics and the media

Investigating how particular communities in Aotearoa New Zealand use the language, markers and tools of science and technology to promote non-credible scientific and social scientific claims.

- Associate Professor Rebecca Priestley (Co-lead)
- Professor Richard Arnold (Co-lead)



Spreading processes on (multilayer and multiplex) networks

Understanding how the outcomes of spreading processes on real-world networks are affected by the multilayer and multiplex network structures and by different network topologies.

- Associate Professor Claire Postlethwaite (Project Co-lead)
- Dr Dion O’Neale (Project Co-lead)
- Dr Emily Harvey



Towards a better understanding of artificial intelligence and its interaction with its environment

Developing new tools to both understand the consequences of interactions between artificial intelligence (AI) and the systems they purport to study.

- Dr William Godsoe (Project Co-lead)
- Dr Emma Sharp
- Associate Professor Claire Postlethwaite (Project Co-lead)



Evolutionary game theory of Bellman agents

Investigating the origin of cooperation using evolutionary game theory.

- Associate Professor Marcus Frean (Project Lead)
- Dr Christina Painting
- Professor Stephen Marsland



Braided rivers: The land the law forgot

Integrating legal, economic, social, and cultural factors into the well-established models of the topology of braided rivers, along with models of climatic uncertainty to better understand these unique landscape features.

- Professor Ann Brower (Project Lead)
- Dr Audrey Lustig



Human activity in the McMurdo Dry Valleys. Rescue, knowledge and understanding our role as a vector of change

Accessing, rescuing, and analysing the vast range of (mostly hidden) historical information about human activities in this geographically and scientifically distinctive region.

- Dr Fraser Morgan (Project Lead)
- Associate Professor Rebecca Priestley
- Dr Pierre Roudier
- Associate Professor Claire Postlethwaite
- Professor Thegn Ladefoged
- Associate Professor Priscilla Wehi



Achieving sustainable and resilient river ecosystems in Aotearoa under climate change

Leveraging data and models to identify solutions to increase the resilience of river ecosystems to uncertain futures both nationally and globally.

- Dr Jonathan Tonkin (Project Lead)
- Professor Michael Plank
- Dr Audrey Lustig



Networks of knowledge sharing

Understanding the driving forces of knowledge propagation through communities and to investigate whether aspects of this process can shine light on quality and/or value associated with certain items of knowledge.

- Professor Uli Zuelicke (Project Lead)
- Professor Jens Dietrich
- Dr Kyle Higham
- Professor Adam Jaffe



Ki te toi o te ora: System change to reverse health inequality and environmental degradation

Identifying key levers of change within health and environment policy systems to restore and improve wellbeing.

- Dr Anna Matheson (Project Co-lead)
- Professor Troy Baisden (Project Co-lead)
- Dr Daniel Hikuroa
- Dr Dion O’Neale
- Professor David Hayman
- Associate Professor Krushil Watene
- Dr Lynn Riggs
- Dr Rachael Ka’ai-Mahuta



Kaitiakitanga and the ecodynamics of early Māori horticulture

Investigating how Māori drew on the knowledge of the founding Polynesian ancestors and developed unique perspectives and practices in response to the Ahuahu Great Mercury Island landscape.

- Professor Thegn Ladefoged (Project Lead)
- Dr Pierre Roudier
- Dr Daniel Hikuroa
- Professor Melinda Allen
- Dr Rebecca Phillipps
- Dr Matiu Prebble
- Associate Professor Priscilla Wehi
- Dr Emily Harvey
- Dr Jonathan Tonkin
- Dr Dion O’Neale



Maths Craft in a Box

Making maths accessible in new ways to support the vital work of maths teachers across the country.

- Dr Jeanette McLeod (Project Lead)
- Dr Phillip Wilson
- Jo Bailey
- Dr David Pomeroy



Kindness in Science

Developing a culture of inclusion which sustains the robust discourse essential for science but does not come at the expense of the dignity of those who participate.

- Associate Professor Tammy Steeves (Project Lead)
- Dr Emma Sharp
- Dr Leilani Walker
- Professor Shaun Hendy
- Dr Aisling Rayne



The Co-production Project

Developing knowledge of co-production in order to improve use of this method in an Aotearoa New Zealand setting.

- Professor Anna Brown (Project Lead)
- Associate Professor Faith Kane
- Associate Professor Siouxsie Wiles
- Associate Professor Rhian Salmon
- Kate Hannah
- Jo Bailey





Our stories



How maramataka can guide kaitiakitanga of awa and moana

Te Kahuratai Painting (Ngāti Manu, Te Popoto, Ngāpuhi) is exploring how maramataka can guide Ngāti Manu kaitiakitanga of awa and moana.

For his Master of Marine Conservation project, Te Kahuratai Painting explored the interconnection between Ngāti Manu kaitiakitanga and maramataka, and how research practice in marine conservation can be guided by maramataka and grounded in whakapapa.

Maramataka is the Māori lunar-stellar-ecological calendar that uses the phases of the moon, the rising of stars in the morning and the timing of ecological phenomena to understand and relate to the environment around us in Aotearoa New Zealand. The revitalisation of maramataka is thriving in te ao Māori at the moment, led by maramataka experts like Rereata Makiha, Rangi Mātāmua and Rikki Solomon.

Te Kahuratai was supervised by Dr Daniel Hikuroa and Dr Tara McAllister, both principal investigators at Te Pūnaha Matatini, and his mahi was funded by a masters scholarship from Te Pūnaha Matatini.

“It was really me exploring two things,” says Te Kahuratai, “my love of maramataka, and of my hapū Ngāti Manu.”

The maramataka system of knowledge includes tātai arorangi Māori astronomy, knowledge of the lunar phases, knowledge of the tides and weather patterns, as well as the timing of the flowering of different trees or the migration of different birds, or the running of fish up and down a river.

The ongoing Covid-19 pandemic prevented Te Kahuratai from holding a planned week-long wānanga at his marae, talking about and looking at stars, learning about the lunar-stellar-ecological calendar, and watching specific marine phenomena.

“What happened instead was a really theoretical exploration of how other people have recreated their own maramataka, because there’s more than 500 across the country,” says Te Kahuratai.



Above: Te Kahuratai Painting on the hoe of Ngahiraka Mai Tawhiti, sailing through Te Moana o Pikopiko-i-whiti. Right: A group of Ngāti Manu and manuhiri on Te Awa Tapu o Taumarere.



In his thesis, Te Kahuratai linked existing maramataka for the Ngāti Manu rohe of Karetu and Taumarere in the Bay of Islands with the teachings of maramataka experts. He conceptualised pūtaiao as Kaupapa Māori science, developed a framework grounded in kaitiakitanga and maramataka for marine conservation, and asked how we can use knowledge like maramataka to change that way that Kaupapa Māori research is conducted.

“If you’re researching it, you should be practicing it,” says Te Kahuratai.

Tara says that “it was a privilege to work with Te Kahuratai on his master’s thesis. In te ao Māori we often talk about tuākana/teina relations, and in this case Te Kahuratai was the tuākana and I was the teina, and I learnt so much from engaging with his work.”

Te Kahuratai was gifted maramataka from Taumarere by Rereata Makiha.

“I worked with three different manuscripts,” explains Te Kahuratai. “One was written in the early 1900s. One was based on an early manuscript but was reprinted for schools back in the 1980s, and the third was a really old one from before the Māori written system was formalised, and it was based on symbols.”

Te Kahuratai is planning to explore these maramataka as a PhD project, to see if the changing climate affects the guidance from ngā wā o mua many decades ago, and investigate how they could be updated for the more unpredictable contemporary environmental conditions caused by a warming planet.

Dan is excited about this research because of “the scope, the privileging of deep knowledge of a specific place, tested through time, and its application in contemporary times, and how it can inform conservation practices.”

Te Kahuratai’s thesis concludes with a framework that will guide his PhD research, based on the whakataukī “Tuia ki te rangi, tuia ki te whenua, tuia ki te moana, tuia ki te here tangata, ka rongo te po, ka rongo te ao,” which means: “weave towards the sky, towards the land, towards the waters, and weave to the binding thread of people, and then you will come to understand the divisions of night and day”.

For Tara, “Te Kahuratai’s thesis is a koha, especially for Ngāti Manu, filled with insight and provocations to rethink the way in which we do our research.”

A summer of machine learning and data sovereignty

Dion Wharerau spent the summer as an intern with Te Hiku Media, working to improve their automatic speech recognition model for te reo Māori.

Dion Wharerau has enjoyed maths since his first years at Kaikohe West School. His teachers supported him by sending him to older classes during maths time, and says that really reinforced his enjoyment of it.

These days he is studying for a Bachelor of Science in Computer Science at the University of Auckland. He says that programming is the perfect combination of problem solving and creativity for him. Dion continues to enjoy studying maths at university, and is disappointed that he won't be able to fit in all the courses that he is interested in before he graduates.



Last year Dion heard about a summer internship with Te Hiku Media and Te Pūnaha Matatini through the Computer Science Tuākana programme.

Māori language revitalisation is a core focus of Te Hiku, and they are working to enable a sovereign digital future for Indigenous languages. One of their key projects is the Papa Reo natural language processing platform.

“I saw the internship and applied for it straight away! I remember going through Te Pūnaha Matatini’s website and really liking everything I read – about problem solving and complexity.”

“I liked the slogan: Complexity is at our heart.”

Dion spent the summer of 2021-2022 working with the Papa Reo team to apply DeepSpeech augmentations to their automatic speech recognition model for te reo Māori.

“My project was to increase the robustness of the machine learning model,” says Dion. “I worked with a lot of amazing people, and I learned a lot along the way. I made lots of mistakes, and I worked with some really amazing software.”

“A big mistake that I corrected early on was asking for help a lot more often. Everyone at Te Hiku was incredibly helpful! Once I started asking for help, things got sorted immediately.”

Central to the natural language processing work that Te Hiku does is a staunch belief that each community must maintain control and sovereignty of their data.

Learning about data sovereignty was new territory for Dion. “Data sovereignty was something I’d never thought about before, because I’d never really worked in a real-life situation that involved other people’s data.”

“I’m incredibly grateful to Te Hiku and Te Pūnaha Matatini, because my internship was a great experience.”



Climate change focus at regional hui in Tāmaki Makarau

In July 2021, Principal Investigators gathered across the motu in a series of regional hui to kickstart the next phase of Te Pūnaha Matatini under the directorship of Associate Professor Priscilla Wehi.

These hui focused firstly on whakawhanaungatanga and introducing new elements in the structure of Te Pūnaha Matatini: the research plan, projects that have been funded, the new Communities of Inquiry, and opportunities for future funding.

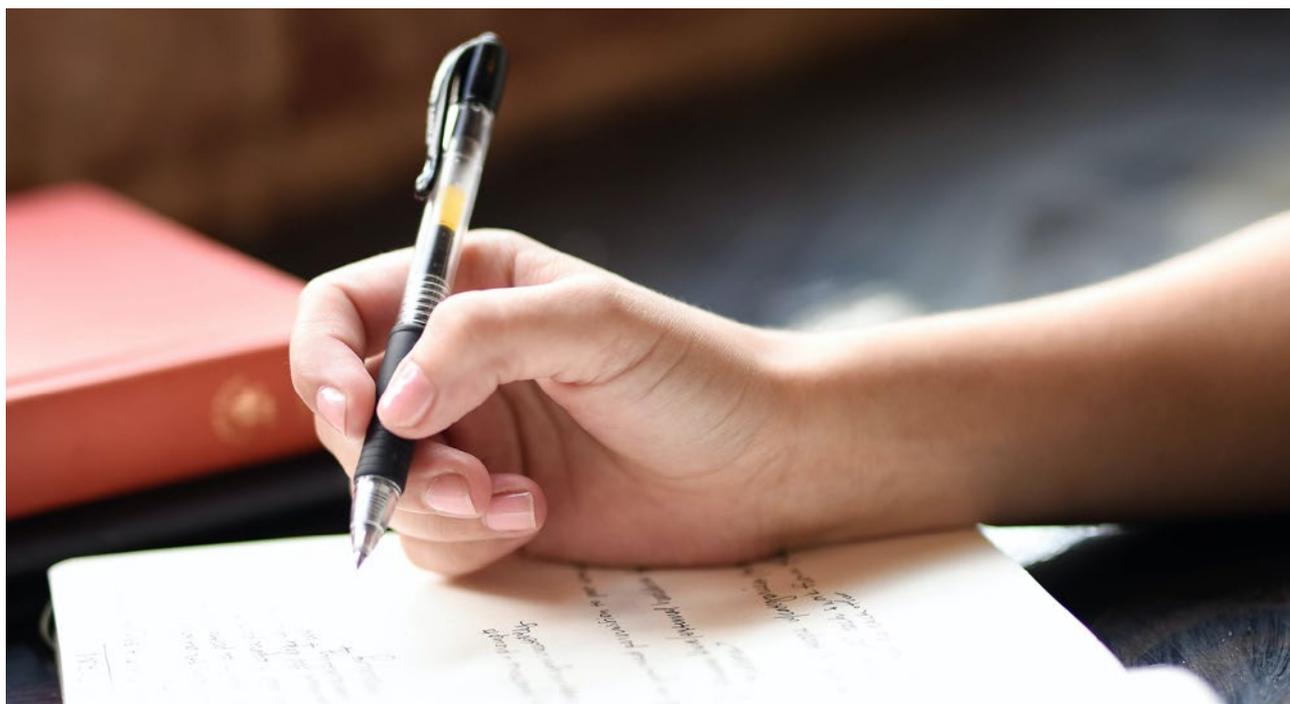
The hui in Auckland then featured three very different talks on climate change and sustainability from Principal Investigators Dr Steffen Lippert, Associate Professor Cate Macinnis-Ng and Dr David Hall.

Steffen is an economist who investigates the institutions that govern climate negotiations. In his presentation he covered the pledge-and-review bargaining leading up to the Paris Agreement, a legally binding international treaty on climate change that entered into force in 2016. He also explored the small heterogeneous climate teams that negotiated emissions cuts for transfers, and the impact of group size on these negotiations.

Cate is a biological scientist, and talked about her research on drought impacts in forests, the need for more work on the impacts of extreme climate events (including heatwaves, drought and fire) on biodiversity and her recent work showing how impacts of climate on biodiversity are often indirect through exacerbation of other stressors such as invasive species.

David researches the politics and policy of climate change. He argued that as momentum develops on climate action, there are three things to keep in mind: thinking holistically, being wary of grand narratives, and fighting for the meaning of useful ideas. He explored nature-based solutions as a type of action that aligns well to these principles.

Te Pūnaha Matatini is well placed to address wicked problems like climate change through its collaborative, transdisciplinary approach. The widely varied interests and approaches of these three investigators demonstrate the collective expertise that we bring to this issue.



Whakawhanaungatanga central to research retreats

Connection, collaboration and time to think and write at retreats are central to the kaupapa of Te Pūnaha Matatini.

In late 2021, as the Delta outbreak receded and the traffic light system was introduced, Te Pūnaha Matatini investigators from across Aotearoa New Zealand emerged from a few months of working at home to reconnect at a series of retreats.

The Mahia te Mahi retreat in early November saw 19 investigators and early career researchers from TPM Whānau gather on the Kāpiti Coast for three precious days to rejuvenate, hosted by the Engagement Community of Inquiry.

Attendees made use of a range of work spaces for collaborative projects and developing ideas, as well as individual focused work in a shared quiet workspace. Engagement-related sessions were woven throughout the retreat, and there was important time to unwind, connect, write, read, work and share delicious kai.

“While we had a diversity of research experience, institutions, age, nationality and cultures represented, it was also a chance to experience what it means for us to all be part of Te Pūnaha Matatini,” reflects Engagement Community of Inquiry Lead Associate Professor Rhian Salmon. “This was demonstrated in the constant babble of collaboration during the daytimes, and evening kōrero about engagement, research culture(s), and allyship.”

This retreat was followed up by back to back retreats in Ōtautahi Christchurch: He Puna Whakaaro retreat and a workshop marking the triumphant return of the Kindness in Science project, which is now firmly established as a central pillar of Te Pūnaha Matatini.

Dr Hamza Ajmal attended He Puna Whakaaro, which was an opportunity for investigators to clear their



heads and get some writing done. Hamza described the retreat as a “much-needed escape, a refreshing experience, and a time to socialise with a nice bunch after I had been working from home for a few months.”

Te Pūnaha Matatini kaumātua Associate Professor Tom Roa conducted morning karakia at this retreat, which Hamza describes as “a new experience” for him.

The centrepiece of He Puna Whakaaro was an informal evening wānanga with special guest and emerging historian Dr Madi Williams (Ngāti Kuia), who spoke about her recent book *Polynesia, 900–1600* and discussed how Indigenous groups have been portrayed in histories.

Madi says that “it was a privilege to be invited and to speak to such an impressive group of people. The manaaki of the group was amazing and before the wānanga we went out for dinner and some whakawhanaungatanga.”

Hamza describes this wānanga as “a great learning opportunity for all of us, especially the insights into Māori values and ways of life.”

Director of Te Pūnaha Matatini, Associate Professor Cilla Wehi, agrees. She says that “the cross fertilisation of ideas at the He Puna Whakaaro writing retreat in Ōtautahi Christchurch was a joy.”

At the workshop that followed this retreat, the fires of Kindness in Science were relit. 16 participants joined the workshop in person and online, from as far away as Windsor in Canada and Boise in the United States. This workshop focused on creating an online toolbox to help others develop a strong inclusive culture of research.

These three in-person events were important to encourage rejuvenation and connection amongst Te Pūnaha Matatini investigators and TPM Whānau in challenging times for collaborative research.

Building an ethical, agile, collaborative research system

Working on our response to Te Ara Paerangi Future Pathways gave Dr Aisling Rayne a much deeper appreciation for the challenges, opportunities, and the diverse perspectives within our research system.

Te Ara Paerangi Future Pathways is a multi-year programme focused on the future of Aotearoa New Zealand's research, science and innovation (RSI) system. The programme seeks to start an open and wide-ranging conversation on a range of issues facing the research system, how these issues might be addressed, and how to take advantage of emerging opportunities.

"The release of a green paper provided the unusual signal that the Ministry of Business, Innovation and Employment needed deep consultation and input before formulating a plan," says Te Pūnaha Matatini Principal Investigator and Observatory lead, Professor Troy Baisden.

The Observatory joined forces with the New Zealand Association of Scientists and the Kindness in Science project to research and write an evidence-based submission on behalf of Te Pūnaha Matatini on how bold reforms can transform Aotearoa New Zealand's RSI landscape into a more connected, resilient and adaptive complex system.

TPM Whānau member Dr Aisling Rayne works on the Kindness in Science project. She says that "In late 2021, the publication Te Ara Paerangi Future Pathways stirred dialogue across Aotearoa New Zealand, including in the Kindness in Science team. In our early conversations, we reflected on how transformative change might move us toward a more just, kind and interconnected system."

"We also identified a broad need to understand the diverse people and relationships that form this complex system, and its trajectory of change."

Te Pūnaha Matatini is the sole CoRE dedicated to complex systems research. As researchers who apply inter- and transdisciplinary approaches to address the most complex and critical issues of our time (pandemics, climate change, intergenerational equity), we are well-placed to comment on the challenges and opportunities facing Aotearoa New Zealand's RSI system.

The team produced ten short working papers available on a public repository, with a few significant insights. These contained historical and systems analysis, literature review, and data analysis which served to inform the submissions from Te Pūnaha Matatini and the New Zealand Association of Scientists – and hopefully others.

Aisling appreciated the chance to be involved in this mahi. "It's a rare thing to have the opportunity for deep reflection on the spaces and communities within which we work," she says. "As an early career researcher, this experience provided me with a much deeper appreciation for the challenges, opportunities, and the diverse perspectives within our research system."

<https://zenodo.org/communities/tearapaerangi/>



TPM Whānau report

**Written by outgoing TPM
Whānau Chair Georgia Vattiato**

TPM Whānau is Te Pūnaha Matatini's early career researcher network. The goals of TPM Whānau include creating connections between members of Aotearoa New Zealand's transdisciplinary community, creating opportunities to learn some of the key skills needed for a successful research career, and developing entrepreneurship and leadership.



TPM Whānau aims to provide a space for collaboration and skill sharing, and we encourage all our members to take an active role in shaping our goals and activities. This is done through retreats, workshops and webinars organised throughout the year and open to all our members.

All students of Te Pūnaha Matatini investigators are automatically invited to be part of TPM Whānau, but we also accept applications from any external applicant whose research interests align with Te Pūnaha Matatini. In 2021, we accepted 54 applications, six of which came from students and early career researchers not directly affiliated with Te Pūnaha Matatini.

Because of the Covid-19 outbreak in August 2021, the Whānau was unable to meet in person for any of our usual yearly retreats. Instead, we organised a series of ten webinars running from June to December, featuring some fantastic guest speakers from both within and outside Te Pūnaha Matatini, with topics spanning from how to improve mental and physical wellbeing to environmental archaeology in Aotearoa New Zealand.

This year's webinar series focused on innovation and entrepreneurship. We established contact with the University of Auckland's Centre for Innovation and Entrepreneurship and provided all Whānau members with information and mentorship opportunity for new business ideas or projects.

We also heard about research opportunities outside of the world of academia, advice for early career researchers, how to best communicate complex research with the media, the risk brought by rising sea levels on archaeology, and what fish skeletons can tell us about Aotearoa's past.

In December 2021, some TPM Whānau committee members met to discuss the future of TPM Whānau, how to best communicate with the Communities of Inquiry (COI), and how to ensure we're fully integrated into the new Te Pūnaha Matatini by taking a more active role in its strategic direction. Some Whānau members are already part of the COI committees, and we have started to brainstorm ideas to create some effective communication channels with the rest of Te Pūnaha Matatini.



Maths Craft in a Box ships to schools

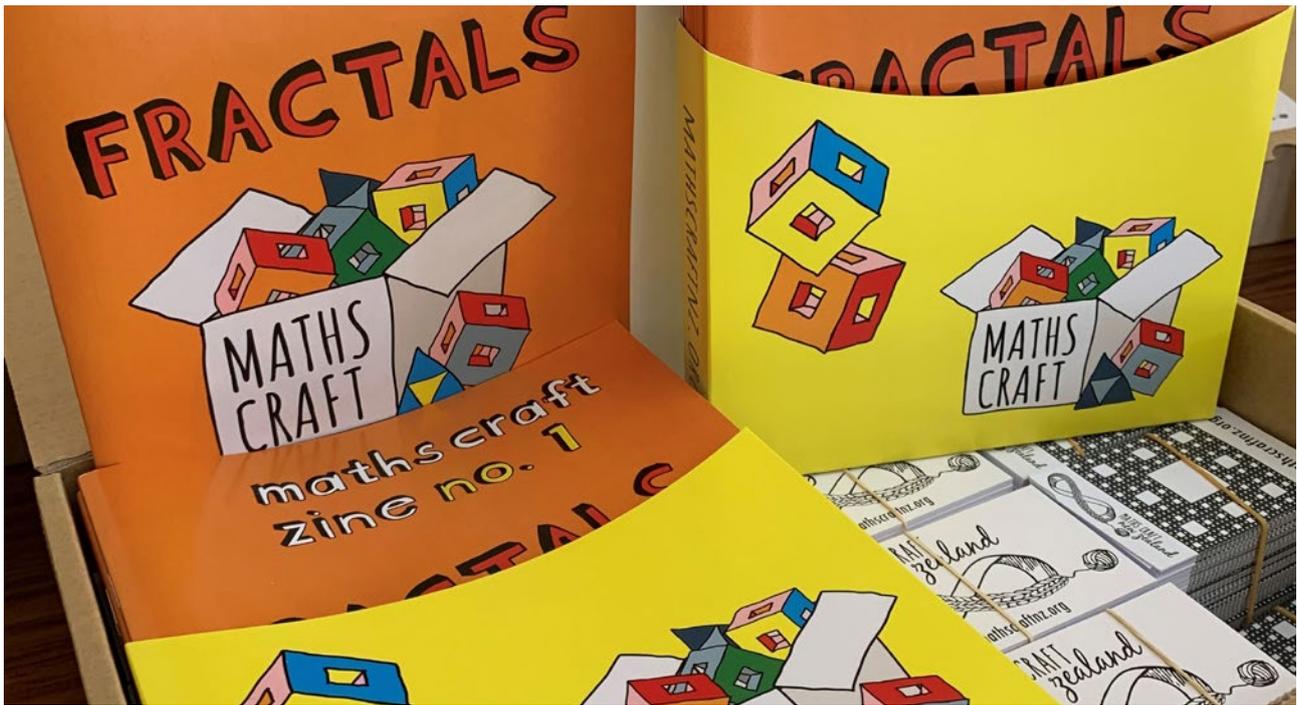
Te Pūnaha Matatini has had a longstanding relationship with Maths Craft, and is proud to now fund Maths Craft in a Box as a core project. Maths Craft brings maths to the masses by celebrating the links between mathematics and craft through events and resources.

Maths Craft in a Box is the latest evolution of this project, which delivers Maths Craft directly into classrooms. Maths Craft in a Box resources schools to support teachers in delivering engaging, cognitively-rich mathematics in the classroom.

The first edition of Maths Craft in a Box is an entirely self-contained box, delivered directly to schools, with everything that students and teachers need to explore the fascinating world of fractals. It includes enough content to easily fill several lessons, and is ideal for years 7-13. In early November 2021 the first boxes shipped to 23 schools in and around Ōtautahi Christchurch as a pilot, and their materials have been enjoyed by at least 700 students across multiple year levels.

“Teachers and students loved it!” says Co-leader of Maths Craft New Zealand and Te Pūnaha Matatini Principal Investigator, Dr Jeanette McLeod. “We received emails and photographs from teachers proudly displaying their work and discussing their classroom experience. Our online survey responses were also full of praise and enthusiasm with comments like: ‘My kids are having such an awesome time with this!’ and ‘The Maths Crafts team is doing an excellent job to help teachers and students to be engaged in learning while having fun.’”

Maths Craft in a Box models Te Pūnaha Matatini’s approach to public engagement. Co-led by Jeanette and Te Pūnaha Matatini Principal Investigator Dr Phil Wilson, the Maths Craft in a Box project includes design expertise from Te Pūnaha Matatini Principal Investigator Jo Bailey, and mathematics education expertise from Dr David Pomeroy of the University of Canterbury.



The snappily designed box includes:

- Craft materials to build a fractal sculpture called a Menger sponge.
- 20 copies of a student zine (workbook) designed to be a guided introduction to the mathematics of fractals. As well as instructions for building a Menger sponge, the zine includes guided reflections, exercises, and extensions for students to work through.
- A teacher version of the zine with additional information and answers to exercises.
- Links to online instructional videos designed to accompany the written instructions in the zines.

With tangible outcomes for teachers and students, Maths Craft in a Box improves confidence with maths and enables novel methods of classroom engagement for teachers. This has important implications for mathematics teaching at all levels and for equity in mathematics more generally.

“Since this was a pilot project, one of our main objectives was to determine if there is a demand for such a box within Aotearoa New Zealand schools.” says Jeanette. “Excitingly, the answer seems to be yes, with teachers giving us feedback like ‘Highly engaging task. Ākonga all acknowledged how much they enjoyed the hands-on nature of this task. They all wanted to do more tasks like this.’ and ‘This was such a wonderful resource. I would welcome the opportunity to engage with other craft boxes should they become available!’”

Based on this overwhelmingly positive feedback, Te Pūnaha Matatini and the Maths Craft in a Box team are excited to launch Maths Craft in a Box nationwide in 2022 to continue to support the vital work of maths teachers across the country.

<https://www.mathscraftnz.org/box>

Research outputs

7 Book chapters

85 Journal articles

4 Keynote presentations

13 Invited speaker presentations

7 Conference papers

1 Conference chaired

6 Conference sessions chaired

36 Contributed talks

1 Art exhibit

Research highlights

Our investigators and TPM Whānau published 141 pieces of peer-reviewed research in the second half of 2021. Here are some of the highlights:

Quentin D. Atkinson and Jennifer Jacquet. 2021. Challenging the idea that humans are not designed to solve climate change. *Perspectives on Psychological Science*
<https://doi.org/10.1177%2F17456916211018454>

Alberto De Rosa, Isabel Castro, and Stephen Marsland. 2021. The acoustic playback technique in avian fieldwork contexts: a systematic review and recommendations for best practice. *Ibis* 164 (2) 371-387 <https://doi.org/10.1111/ibi.13033>

Māui Hudson, Jane Anderson, and Rogena Sterling. 2021. Protecting Indigenous data sovereignty. In “He Pou Hiringa,” edited by Katharina Ruckstuhl, Merata Kawharu and Maria Amoamo. BWB Bridget Williams Books. <https://www.bwb.co.nz/books/he-pou-hiringa/>

Billie Lythberg and **Daniel Hikuroa.** 2021. How can we know Wai-Horotiu—a buried river?: Cross-cultural ethics and civic art. *Settler Colonialism and Environmental Ethics* 42 (4) 373-390
<https://doi.org/10.5840/enviroethics202042434>

Tara G. McAllister, Sereana Naepi, Kelly Dombroski, Sian E. Halcrow, and **Christina J. Painting.** 2021. Parity during parenthood: Comparing paid parental leave policies in Aotearoa/New Zealand’s universities. *Women’s Studies Journal* 35 (1) 4-20 <https://doi.org/10.17608/k6.auckland.16945960.v1>

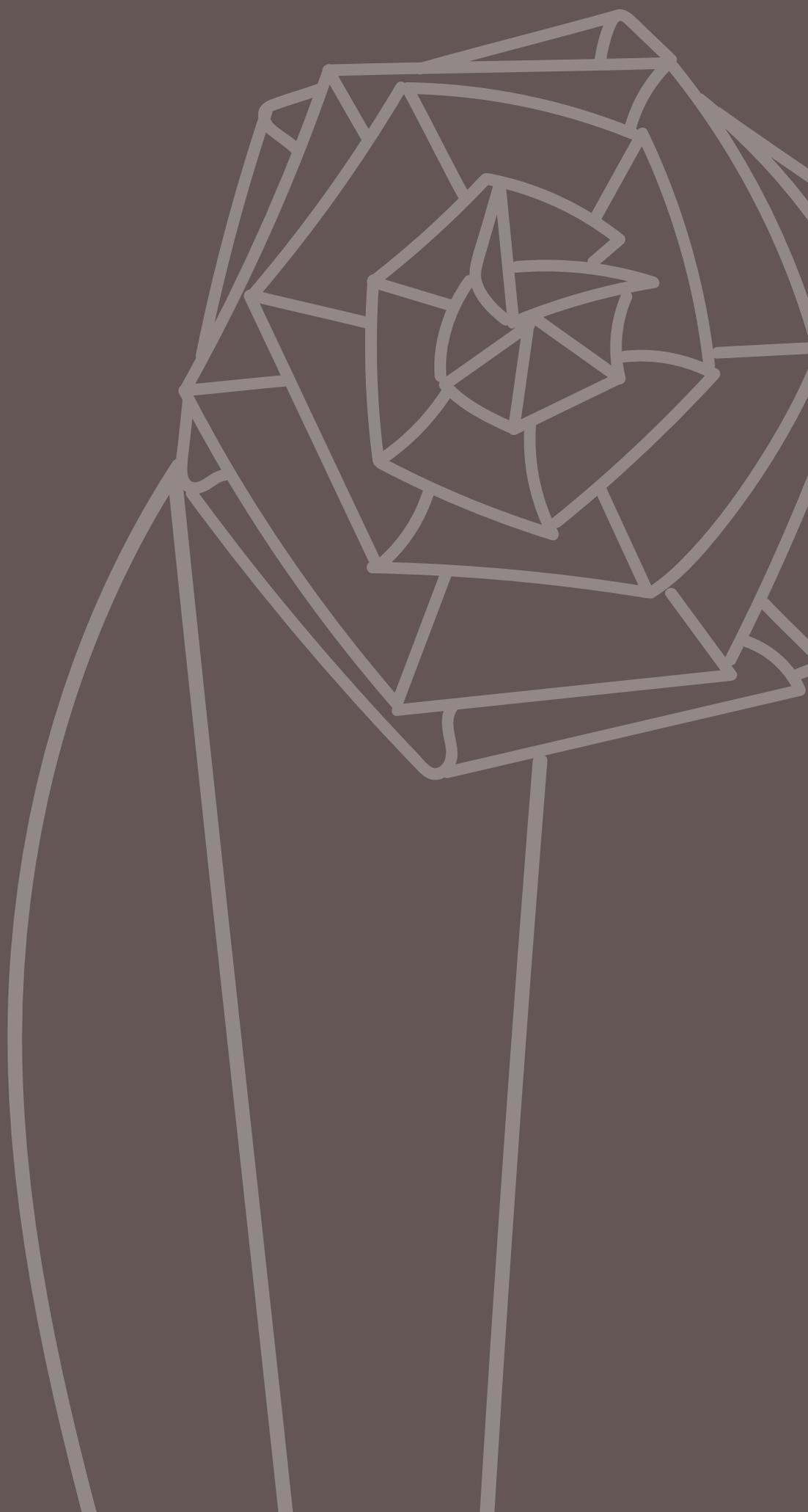
Jeanette C. McLeod, Phillip L. Wilson, David Pomeroy, and Julie Alderton. 2021. Crafting connections in post-COVID classrooms: learning university mathematics through craft. *International Journal of Mathematical Education in Science and Technology* 53 (3) 728-737 <https://doi.org/10.1080/0020739X.2021.1984597>

Julie Mugford, Elena Moltchanova, **Michael J. Plank**, Jon Sullivan, **Andrea Byrom**, and **Alex James**. 2021. Citizen science decisions: A Bayesian approach optimises effort. *Ecological Informatics* 63 101313 <https://doi.org/10.1016/j.ecoinf.2021.101313>

Alex J. Schuddeboom, and **Adrian J. McDonald**. 2021. The Southern Ocean radiative bias, cloud compensating errors, and equilibrium climate sensitivity in CMIP6 models. *Journal of Geophysical Research: Atmospheres* 126 (22) e2021JD035310 <https://doi.org/10.1029/2021JD035310>

Jonathan D. Tonkin, Julian D. Olden, David M. Merritt, Lindsay V. Reynolds, Jane S. Rogosch, and David A. Lytle. 2021. Designing flow regimes to support entire river ecosystems. *Frontiers in Ecology and the Environment* 19 (6) 326-333 <https://doi.org/10.1002/fee.2348>

You can see all of our published research at <https://www.zotero.org/tepunahamatatini/library>





Awards, grants and public engagement

Innovative research at the intersection of science and mātauranga

Associate Professor Priscilla Wehi has been awarded the 2021 Hill Tinsley Medal from the New Zealand Association of Scientists (NZAS).

Cilla is the Director of Te Pūnaha Matatini and a leading figure in conservation biology and ethnobiology in Aotearoa New Zealand. The Hill Tinsley Medal recognises her innovative research at the intersection of science and mātauranga.

The NZAS Medals for 2021 were presented on 15 November 2021, following the Association's online conference and AGM. The Hill Tinsley Medal is awarded for outstanding fundamental or applied research in the physical, natural or social sciences published by a scientist or scientists within 15 years of their PhD.

Cilla engages with some of the most challenging conservation issues that confront humanity globally, focusing on the links between culture, biodiversity, and ecological restoration.

Her research is cross-disciplinary and incorporates humanities and western science, working with both quantitative and qualitative approaches in learning how the world works. She has also been active in finding non-traditional ways of communicating her research, collaborating in media from comics to film.

"When I look at the past recipients of the Hill Tinsley Medal, I see scientists who have created change in both our understanding of the world, and the tools we use to examine problems," says Cilla.

"It is a huge privilege to be part of this group. However I also want to acknowledge the immense contribution of all researchers, and the collective body of work that we contribute to, which enables us to solve problems. Kua rarangatahi tātou he whariki mō ngā rā a mua."

Cilla's research interests are focused on human-nature relationships, including biocultural diversity and Indigenous environmental relationships. She also works on introduced species that challenge native ecosystems, insect ecology and behaviour, and interdisciplinary Antarctic research.

Professor Troy Baisden said that "From the perspective of NZAS President presenting the award, and knowing Cilla as a Te Pūnaha Matatini investigator, the citation and her response on accepting the award sum up how she has showed daring in crossing disciplinary boundaries to deliver major insights through excellent research, while always thinking of people along the way."

"Her work and the citations speak for themselves, yet she wanted to communicate that a significant amount of her work was carried out on precarious contracts. She had the daring to succeed while taking risks, but the risks and challenges facing post-docs interrupted by the pandemic is huge – she asks how we can do more to help today's emerging researchers."

Cilla is passionate about inclusivity and diversity in science and has undertaken extensive work with Māori communities to incorporate their needs and aspirations. Her natural curiosity and open approach to multiple ways of knowing make her a role model and natural leader for many emerging scholars who seek to work in a cross-cultural way.

<https://scientists.org.nz/2021-Awards>



Awards

Associate Professor Priscilla Wehi

Hill Tinsley Medal

Professor Michael Plank

Fellow of the New Zealand Mathematical Society
University of Canterbury Research Medal

Associate Professor Claire Postlethwaite

Fellow of the New Zealand Mathematical Society

Associate Professor Alex James

University of Canterbury Research Medal

Dr Tara McAllister

New Zealand Freshwater Science Society Early
Career Researcher Award

Dr Emma Sharp

Early Career Researcher of the year, School of
Environment, University of Auckland
Research Communication Award, School of Envi-
ronment, University of Auckland

Professor Stephen Marsland

Runner up for Open Source New Zealand's Open
Source Science Software of the Year

Grants

Te Pūnaha Matatini investigators are leading projects which received \$42 million from various funding bodies from July to December in 2021. These include:

Associate Professor Claire Postlethwaite received a \$684,000 grant from the 2021 Marsden Fund of the Royal Society of New Zealand, along with two associate investigators. The project, titled “Beyond survival of the fittest: population dynamics of cyclic competition networks”, examines how network architecture is a key mechanism underlying models of competitive interactions between plant or animal species.

Associate Professor Tammy Steeves received a \$1,000,000 Smart Ideas grant through the Ministry of Business, Innovation and Employment 2021 Endeavour Fund Investment Round. The project, titled “Building an integrative genomics framework to mitigate maladaptive reproductive traits in endangered species,” is a nationwide project investigating the DNA structure of the Kākāpō to find the cause of high hatching failure.

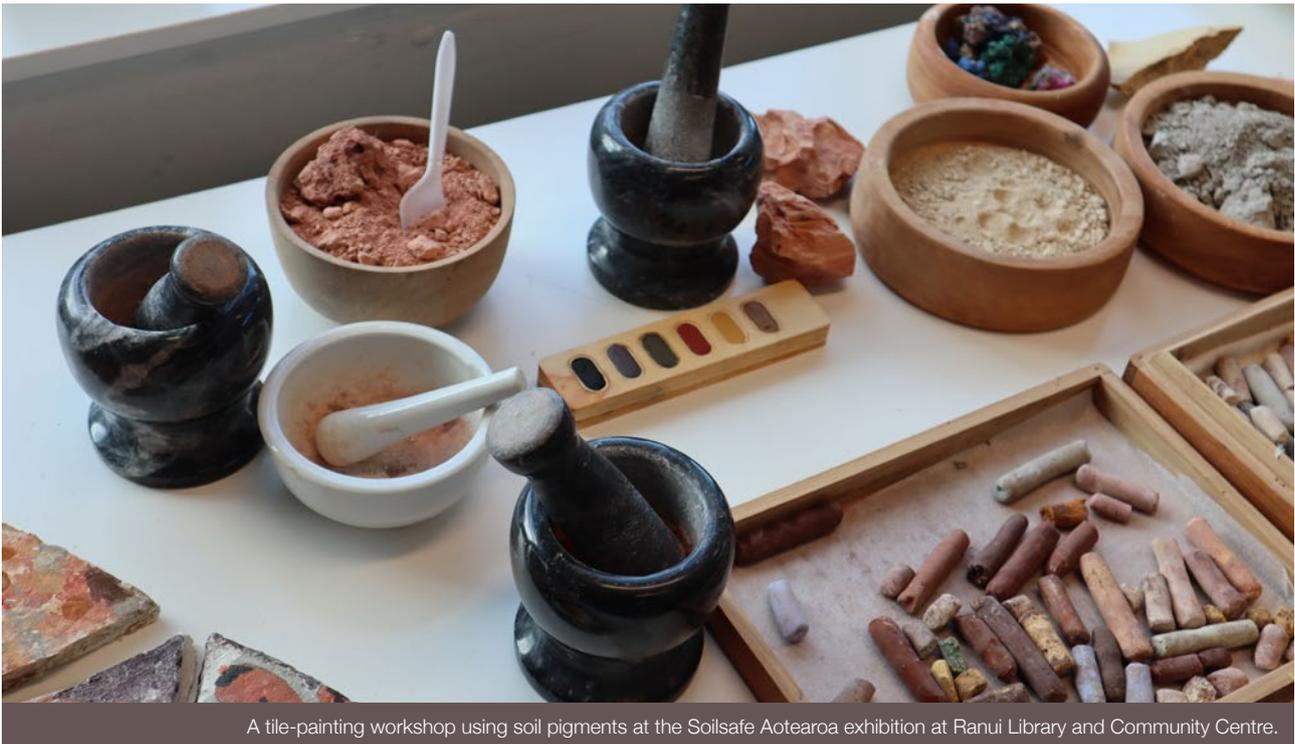
With Funding from Callaghan Innovation, Associate Professor Markus Luczak-Roesch will lead a two-year, \$2 million Science for Technological Innovation National Science Challenge (SfTI) research project entitled “Enabling end-to-end veracity within value exchange ecosystems.”

Associate Professor Krushil Watene and Associate Professor Priscilla Wehi will co-lead a project called “Kaitiakitanga and Antarctic Narratives,” which received a \$680,000 Marsden Fund grant.

Dr Simone Linz was awarded \$637,000 from the Marsden Fund for a project titled “Relentlessly complex? New algorithmic foundations to analyse complex evolution.”

Dr Emma Sharp received \$149,000 from the MBIE Unlocking Curious Mind Fund for an extension of her Soilsafe work, “Soilsafe Kids: Engaging school children and their families in soil science.”

With \$1,330,000 from the Tertiary Education Commission, Associate Professor Nirmal Nair will lead work for Te Hiranga Ru: QuakeCore titled “Harnessing Disruptive Technologies for Earthquake Resilience”.



A tile-painting workshop using soil pigments at the Soilsafe Aotearoa exhibition at Rānui Library and Community Centre.

Public engagement

Public engagement is central to the kaupapa of Te Pūnaha Matatini. Alongside a considerable volume of peer-reviewed publications in academic publications, our investigators work hard to communicate their research to diverse audiences.

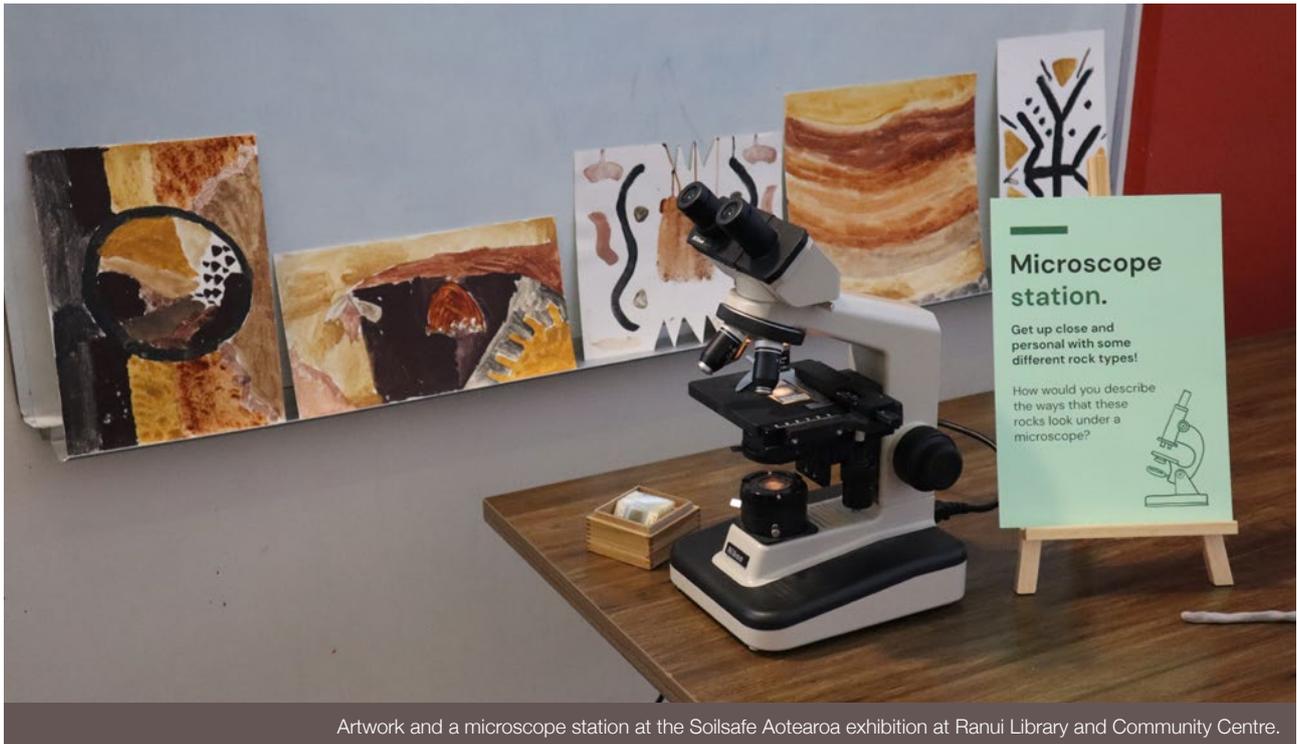
Principal Investigator Dr Emma Sharp and the Soilsafe Aotearoa team held an art exhibition at Rānui Library and Community Centre in Tāmaki Makaurau Auckland to share the soil values of their community and highlight local artists who capture diverse soil values in their work. This included artwork by local artists, a tile-painting workshop with soil pigments, a soil photoscape and soundscape, a microscope station... and worms.

Dr Daniel Hikuroa, Professor Tahu Kukutai, Associate Professor Tammy Steeves and Associate Professor Krushil Watene all delivered keynote addresses virtually throughout the world, and Associate Professor Cilla Wehi chaired a conference in Dunedin. Other investigators chaired conference sessions throughout Aotearoa New Zealand and Australia, and our early career researchers were especially busy delivering invited talks.

Our investigators working with Covid-19 Modelling Aotearoa were in high demand in the media for their insights into the Delta and Omicron outbreaks in Aotearoa New Zealand, Kate Hannah was often in the media sharing her disinformation research, and Associate Professor Siouxsie Wiles tirelessly continued her world-class science communication about the pandemic.

Dr David Hall appeared frequently in the media to share his expertise on climate change policy, and Professor Tava Olsen provided insight into supply chains, which have been in the headlines a lot because of disruptions.

And most importantly, the Giraffe Weevil was featured in the New York Times, thanks to the work of Dr Christina Painting.



Artwork and a microscope station at the Soilsafe Aotearoa exhibition at Ranui Library and Community Centre.

Media highlights

A significant number of New Zealanders overestimate sea-level rise – and that could stop them from taking action, featuring Associate Professor Rebecca Priestley and Zoë Heine

<https://theconversation.com/a-significant-number-of-new-zealanders-overestimate-sea-level-rise-and-that-could-stop-them-from-taking-action-164312>

Should I get vaccinated if I'm pregnant, trying to get pregnant, or breastfeeding?

featuring Associate Professor Siouxsie Wiles

<https://thespinoff.co.nz/society/18-09-2021/siouxsie-wiles-should-i-get-vaccinated-if-im-pregnant-trying-to-get-pregnant-or-breastfeeding>

Maybe we should be shouting at clouds, featuring Professor Adrian McDonald

<https://thespinoff.co.nz/science/16-08-2021/maybe-we-should-be-shouting-at-clouds>

Meet the Giraffe Weevil. It's got a secret up its long snout, featuring Dr Christina Painting

<https://www.nytimes.com/2021/08/13/science/meet-the-giraffe-weevil-its-got-a-secret-up-its-long-snout.html>

Dr David Hall: Why pricing emissions isn't enough

<https://www.nzherald.co.nz/business/dr-david-hall-why-pricing-emissions-isnt-enough/EK76URKETIPUR3E5EHGCRFFS3A/>

Indigenous data protection system to branch out into Māori communities, featuring Associate Professor Māui Hudson

<https://www.stuff.co.nz/pou-tiaki/300427310/indigenous-data-protection-system-to-branch-out-into-mori-communitites>

Yes, the supply chain grinch will probably steal Christmas again, featuring Professor Tava Olsen

<https://www.stuff.co.nz/business/126259905/yes-the-supply-chain-grinch-will-probably-steal-christmas-again>

Governance and management

Advisory Board

Richard Aitken (Chair)

Transpower Limited

Peter-Lucas Jones

Te Hiku Media

Pieta Brown

Orion Health

Professor Wendy Lawson

AUT

Atawhai Tibble

Haemata

Professor John Hosking

University of Auckland

Professor Jim Metson

University of Auckland

Strategic Leadership Group

Associate Professor Ilze Ziedins

Complexity Community of Inquiry Lead
University of Auckland

Associate Professor Krushil Watene

Culture of Research Excellence Community of Inquiry Lead
Massey University

Associate Professor Rhian Salmon

Engagement Community of Inquiry Lead
Victoria University of Wellington – Te Herenga Waka

Dr Anna Matheson

Project Leader Representative
Victoria University of Wellington – Te Herenga Waka

Professor David Hayman

Investigator Representative
Massey University

Associate Professor Tom Roa

Kaumātua
University of Waikato

Dr Michael O’Sullivan

Deputy Director
University of Auckland

Associate Professor Priscilla Wehi

Director
University of Otago

Kathryn Morgan

Research Operations Manager
University of Auckland

Giorgia Vattiato

Chair, TPM Whānau
University of Canterbury

Financial report 2021

Funding summary for the six-month period to 31 December 2021

	Actuals
	\$000
Funding received	
Tertiary Education Commission grant	2,000
Surplus carried forward	0
Total funding received	2,000
Expenditure	
Salaries funded by CoRE	81
Other costs	
Overheads	104
Project costs	43
Travel	14
Postgraduate students	0
Extra-ordinary expenditure	0
Total other costs	161
Total expenditure	242
Net surplus/(deficit)	1,758

Notes

This report covers the period from 1 July 2021 to 31 December 2021 and details funding received and funds distributed to collaborative partners of Te Pūnaha Matatini.

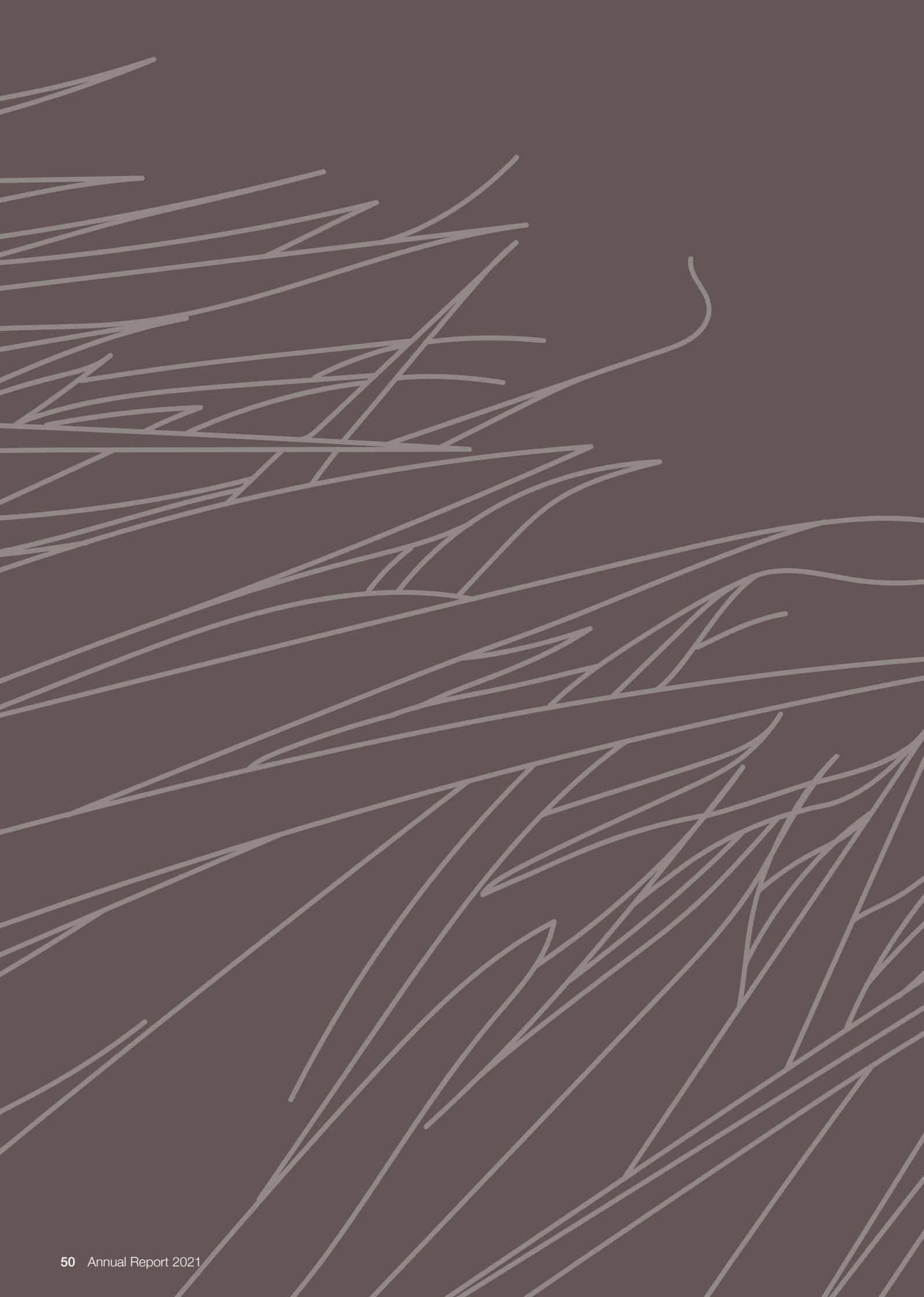
All amounts are shown exclusive of Goods and Service tax (GST).

The net surplus will be carried forward into 2022 to be spent on back-dated costs post contract execution.

2021 summary

Broad category	Detailed category	Yr1*
Value of CoRE funding from TEC (\$M)		2,000,000
FTEs	Principal investigators	1.80
by category	Associate investigators	0
	Administrative/support	1.62
	Total	3.42
Headcounts	Principal investigators	78
by category	Associate investigators	0
	Postdoctoral fellows	8
	Research technicians	1
	Administrative/support	4
	Other	5
	Research students	63
	Total	159
Peer-reviewed research	Book chapters	7
	Journal articles	85
	Conference papers	7
	Other	42
	Total	141
Students studying at CoRE	Doctoral degree	40
by level	Masters degree	11
	Other	12
	Total	63
Number of students completing qualifications	Doctoral degree	6
	Masters degree	3
	Other	3
	Total	12
Immediate post-study graduate destinations (since 1 July 2021)	Employed overseas	11%
	Employed in NZ	89%

*Six months from 1 July 2021 to 31 December 2021



Our people

78 Principal Investigators

205 TPM Whānau

4 HQ Team

1 Kaumātua

Kaumātua

Associate Professor Tom Roa

Kaumātua
University of Waikato

Executive team

Associate Professor Priscilla Wehi

Director
University of Otago

Dr Michael O’Sullivan

Deputy Director
University of Auckland

Kathryn Morgan

Research Operations Manager
University of Auckland

Jonathan Burgess

Communications and Marketing Senior Adviser
University of Auckland

Pauline Donougher

Research Operations Coordinator
University of Auckland

Alice Zhao

Research Operations Administrator
University of Auckland

Principal investigators

Dr Hamza Ajmal

Livestock Improvement Corporation

Professor Melinda Allen

University of Auckland

Professor Richard Arnold

Victoria University of Wellington – Te Herenga Waka

Professor Quentin Atkinson

University of Auckland

Jo Bailey

Massey University

Professor Troy Baisden

Motu

Dr Rachelle Binny

Manaaki Whenua Landcare Research

Dr Élodie Blanc

Motu

Professor Ann Brower

University of Canterbury

Professor Anna Brown

Massey University

Professor Isabel Castro

Massey University

Professor Murray Cox

Massey University

Dr Giulio Valentino Dalla Riva

University of Canterbury

Associate Professor Marcus Frean

Victoria University of Wellington – Te Herenga Waka

Professor Mark Gahegan

University of Auckland

Dr William Godsoe

Lincoln University

Professor Michele Governale

Victoria University of Wellington – Te Herenga Waka

Dr David Hall

AUT

Kate Hannah

University of Auckland

Dr Pauline Harris

Victoria University of Wellington – Te Herenga Waka

Dr Emily Harvey

M.E Research

Professor David Hayman

Massey University

Professor Shaun Hendy

University of Auckland

Dr Daniel Hikuroa

University of Auckland

Associate Professor Māui Hudson

University of Waikato

Professor Alex James

University of Canterbury

Dr Rachel Ka’ai Mahuta

AUT

Professor Tahu Kukutai

University of Waikato

Professor Thegn Ladefoged

University of Auckland

Dr Simone Linz

University of Auckland

Dr Steffen Lippert

University of Auckland

Dr Kirsten Locke

University of Auckland

Dr Markus Luczak-Roesch

Victoria University of Wellington – Te Herenga Waka

Dr Audrey Lustig

Manaaki Whenua Landcare Research

Associate Professor Cate Macinnis-Ng

University of Auckland

Professor David Maré

Motu

Professor Stephen Marsland

Victoria University of Wellington – Te Herenga Waka

Dr Anna Matheson

Victoria University of Wellington – Te Herenga Waka

Dr Tara McAllister

University of Auckland

Professor Adrian McDonald

University of Canterbury

Dr Jeanette McLeod

University of Canterbury

Dr Barry Milne

University of Auckland

Dr Tze Ming Mok

Auckland Council

Dr Fraser Morgan

Manaaki Whenua Landcare Research

Associate Professor Marama Muru-Lanning

University of Auckland

Associate Professor Nirmal Nair

University of Auckland

Dr Dion O’Neale

University of Auckland

Dr Michael O’Sullivan

University of Auckland

Professor Tava Olsen

University of Auckland

Professor Les Oxley

University of Auckland

Dr Christina Painting

University of Waikato

Dr Matthew Parry

University of Otago

Dr Rebecca Phillipps

University of Auckland

Professor Michael Plank

University of Canterbury

Associate Professor Claire Postlethwaite

University of Auckland

Dr Matiu Prebble

University of Canterbury

Associate Professor Rebecca Priestley

Victoria University of Wellington – Te Herenga Waka

Dr Mubashir Qasim

Livestock Improvement Corporation

Dr Lynn Riggs

Motu

Associate Professor Tom Roa

University of Waikato

Dr Pierre Roudier

Manaaki Whenua Landcare Research

Associate Professor Rhian Salmon

Victoria University of Wellington – Te Herenga Waka

Dr Emma Sharp

University of Auckland

Dr Inga Smith

University of Otago

Associate Professor Tammy Steeves

University of Canterbury

Dr Jonathan Tonkin

University of Canterbury

Associate Professor Arvind Tripathi

University of Auckland

Dr Sandra Velarde

New Zealand Climate Change Commission

Associate Professor Cameron Walker

University of Auckland

Dr Leilani Walker

Tāmaki Paenga Hira Auckland War Memorial Museum

Associate Professor Krushil Watene

Massey University

Associate Professor Priscilla Wehi

University of Otago

Professor Hēmi Whaanga

University of Waikato

Associate Professor Siouxsie Wiles

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Kairangi

Kairangi is a Māori term meaning ‘the finest pounamu’ (greenstone or jade) which can be used to describe a person held in high esteem. This category of investigator reflects our development as an organisation and acknowledges the important contributions of our senior colleagues.

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Te Pūnaha Matatini
Complexity is at our heart