

Indigenous Science Network Bulletin

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Promoting First Nations' science, teaching & education



‘Our people are the world’s first scientists; 65,000 years of astronomy and chemistry,’ explains **Corey Tutt, Founder of Deadly Science**. ‘There’s a certain part of science that’s deeply ingrained in our culture and our identities as Aboriginal people in Australia.’

Pictured above are some Aboriginal students who have worked closely with Corey in learning about and doing science. They are proudly holding up Certificates of Achievement that show they are Future Deadly Astrophysicists! Read more on p10 following.

For more information about Deadly Science, click on the image of Corey Tutt, taken when he was announced as 2019 NSW Young Australian of the Year:



© Salty Dingo

FROM THE COORDINATOR

This is the first Bulletin of the Indigenous Science Network for 2021. We can all agree that 2020 will not be forgotten in a hurry, given the massive effects of the Covid19 pandemic across the globe. Sadly, the pandemic has been particularly severe for many First Nations peoples, as western countries and the pharmaceutical industry foreground the needs of their citizens where fat profits are guaranteed. For those network members residing in Australia or New Zealand, we can count ourselves lucky that our leaders have generally taken the advice of health professionals and made the hard decisions to prioritise saving lives over keeping the economy afloat. We have watched in disbelief as other countries struggle to deal effectively with the pandemic, with many of their citizens and leaders actively ignoring science and reason to make the pandemic far worse! (Not that we are immune from those who promote feelings over facts, even within our governments). For those network members who have lost colleagues, friends or loved ones, our thoughts are with you.

We have a great issue with two submissions from members looking at efficacious pedagogy for Indigenous students, one based in a Canadian university teaching chemistry remotely, and the other in Australia considering the use of Kriol to enhance understandings in Yr 11 high school biology. Big thanks to Michelle Hogue and Genevieve Firmer for allowing us to share their valuable and important stories.

FIRST NATIONS CO-EDITORS

The group of Indigenous academics and educators who make up our editorial team have been joined by a representative of Pasifika peoples. We are very happy to announce that Associate Professor Frances C. Koya-Vaka'uta, Director of Oceania Centre for Arts, Culture and Pacific Studies with the University of the South Pacific has agreed to join with us. Welcome Frances!

AN ONLINE HOME FOR THE BULLETINS

Up until the end of 2017, all ISN bulletins have been stored on Mike Michies' personal website: <http://members.ozemail.com.au/~mmichie/network.html>. With the renewal of the network, we need to find a permanent home. Network members' suggestions on how we might resolve this issue would be most welcome!



Tiwi designs by Jennifer Coombs, Melville Island, NT

First Nations' Co-Editors

Professor Elizabeth McKinley, University of Melbourne, AUSTRALIA

A. Professor Michelle M. Hogue, University of Lethbridge, CANADA

A. Professor Michael-Shawn Fletcher, University of Melbourne

Dr. Femi S. Otulaja, University of Witwatersrand, SOUTH AFRICA

A. Professor Frances C. Koya-Vaka'uta, University of the South Pacific, FIJI

Joe Sambono, ACARA, Brisbane, AUSTRALIA

Carly Jia, AITSL, Melbourne

Jesse King, Stronger Smarter Institute, Brisbane

Aims of the Indigenous Science Network

Originating from a meeting in 1998 of science educators and Indigenous community members in Darwin, Australia. We agreed that there should be a central place for Indigenous knowledge in any science curriculum. We have grown to cater for scientists, educators and Indigenous community members from across the world:

- To promote First Nations science, teaching and education
- To support all educators who would like to improve their knowledge and understanding of Indigenous science and how to access and use it in their teaching
- To involve Indigenous scientists, educators and community members who support the inclusion of Indigenous knowledge in teaching science and are open to dialogue and sharing about their own experiences.

We acknowledge and pay respect to the past, present and future Traditional Custodians and Elders of the Aboriginal and Torres Strait Islander peoples of Australia and all First Nations peoples across the world. We celebrate and promote the continuation of their cultural, spiritual and educational practices.

Professor Elizabeth McKinley ONZM is Executive Director of the Atlantic Fellows for Social Equity at the University of Melbourne and previously Professor of Indigenous Education, Melbourne Graduate School of Education. She writes here as one of eight ISN First Nations Co-Editors.



Naumai, haere mai! Welcome to the first bulletin of the Indigenous Science Network (ISN) for 2021.

Today I wish to mark two events in this editorial. The first is a personal one. Being a New Zealand Māori (*Ngāti kahungunu/Kai Tahu*) I wish to begin by mentioning the coming together of two sovereign peoples 181 years ago to sign a treaty at Waitangi in Aotearoa New Zealand. The treaty was signed in 1840 between 500 Māori chiefs and British representatives on behalf of Queen Victoria. It is an important day to remember all those people - including many who have passed on - who were at the forefront of the movement to have Te Tiriti o Waitangi honoured. While there are many issues that still need to be addressed, Aotearoa New Zealand can celebrate this national day, particularly the progress made in the last 50 years.

The second event is the global pandemic and its effects on Indigenous peoples (and by extension Indigenous knowledge and wellbeing). It is hard to begin 2021 without acknowledging what the world has been through in 2020 and its effects on Indigenous populations everywhere. While Aotearoa New Zealand, Australia, and the Pacific Islands have been very fortunate in managing to keep their Indigenous communities largely Covid-19 free, not all Indigenous communities have been so fortunate. In many American Indian communities, the number of tribal elders dying from the disease is causing a cultural crisis (<https://www.nytimes.com/2021/01/12/us/tribal-elders-native-americans-coronavirus.html>) – an irretrievable loss of knowledge and language that is usually passed down the generations. In the article Jason Salsman from the Moscogee Nation says: "It's like we are having a cultural book-burning ... One day soon, there won't be anybody (left) to pass this knowledge down."

However, it is not just the loss of traditional knowledge and practices but also the guidance for the positioning of Indigenous communities in relation to current and future science topics and issues. Here I mean how Indigenous peoples react and incorporate 'new' science knowledge to form an Indigenous or, more often, specific cultural standpoints as we incorporate it into our Indigenous knowledge base.

We have a saying in Aotearoa New Zealand that goes: *Taku ahi tūtata, taku mata kikoha; taku ahi mamao, taku mata kipo* (When my fire is close by, the point of the weapon is sharp, but when the fire is distant the point is blunt) (Mead, 2003, p.335). Issues such as genetic modification (GM), genetic engineering (GE), in-vitro fertilisation (IVF), organ transplants, surrogate motherhood, and the like can challenge Indigenous cultures. When these debates reach our countries, Indigenous communities have to engage in the debates. Inevitably we often try to identify an 'Indigenous' position (or Māori position in Aotearoa New Zealand's case). In our attempt to identify a position, we have to engage with our own cultural protocols and knowledge bases to construct a framework of assessment for ethics committees and people working in the health field. It is these fields that are called upon to make regulations about these issues for a country. So instead of focusing on the age-old debates of traditional ecological knowledge (TEK) and Indigenous knowledge (IK) and the like, we are drawn directly into the Indigenous knowledge/science interface creating future Indigenous positions and knowledge.

We don't often think about creating Indigenous (science) knowledge, we often see Indigenous science as having been developed in the past and forming a 'practice', such as cultural burning in Australia. The examples cited above are obviously challenging to a number of beliefs, but there are other circumstances where new Indigenous knowledge is created. In the bulletin you will find Michael-Shawn Fletcher's oration given late last year on cultural burning. Here is an example of knowledge developed in the past (traditional ecological knowledge) being put to use more widely in contemporary times. However, it is not just about learning something from the past because the climactic conditions in Australia are changing and so the knowledge became adapted. So, we are using 'old' Indigenous knowledge and adapting it to different conditions to create 'new' Indigenous knowledge. These examples show not only the versatility of Indigenous knowledge, they also show that it undergoes continual renewal and growth guided by our cultural protocols and law/lore.

And before I end this editorial, I want to send our groups' sympathies to the Indigenous peoples who have experienced the worst of Covid-19 which has torn the fabric of their communities. And lastly, I would like to acknowledge the hard work of Dr Michael Michie who had the vision to provide access to Indigenous science material and resources as a means to support science teachers interested in teaching Indigenous science and also to educate ourselves. We now have a very valuable archive.

I hope you find something here of interest.

Liz McKinley

INDIGENOUS SCIENCE NETWORK: BULLETIN ITEMS

Items are listed under four headings being News and Views; Resources; Indigenous Astronomy; and Conferences / Seminars. Weblinks for most items are contained as hyper-linked addresses or as hotspots within illustrations. Some items will not have links. All links were active at the time of publication (11 February 2021).

ACKNOWLEDGMENT: This issue contains items from the following network members: Mike Michie, Duane Hamacher, Lynne Kelly, Genevieve Firmer, Michelle Hogue, Michael Fletcher, Brad Moggridge, Rebecca Taylor and Liz McKinley. Many thanks and to all members, your future submissions are most welcome.

Aboriginal and Torres Strait Islander people should be aware that this bulletin may contain images and names of deceased persons.

NEWS AND VIEWS

Indigenous grains grown in northern NSW deemed 'commercially viable'

(ABC News: 8 Nov 2020)

Ancient native grains, or 'dhunbarbila', could kick off a new industry in north-west New South Wales after a year-long study by the University of Sydney found them to be commercially viable. The Indigenous Grasslands for Grains project factored in everything from sustainable growing through to harvesting, processing, sales and food production.

"We know these grains are edible — they taste delicious — we know that they grow well, we know environmentally and culturally, they are very significant," study leader Dr Angela Pattison said.

Uncle Bruce Pascoe (of [Dark Emu](#) fame) would be very happy to hear of this, as he champions the use of historic Aboriginal crops.



Researchers have grown, harvested, processed and cooked 15 native Indigenous grains over a year-long study. *(ABC New England North West: Jennifer Ingall)*

Wilcannia witnesses historic floating of Aboriginal canoe along Darling River

(ABC News: 5 Dec 2020)

The first traditionally made Indigenous canoe to appear on the Darling River in 80 years has taken to the water in Wilcannia. Mununjali/Wiradjuri girl Shanaha Clayton helped make the canoe and took it out onto the river. She said it was important to learn about a different culture and become involved in the project.

"It's not my culture but I grew up here," she said. "I've learnt a lot of the language from growing up here, so it's good to know a bit of something I've never learnt before."



The river red gum canoe was made as part of the Barkindji Canoe Project. *(ABC Broken Hill: Callum Marshall)*

Food, tools and medicine: 5 native plants that illuminate deep Aboriginal knowledge (*The Conversation: 21 Oct 2020*)

Over countless millennia, Aboriginal and Torres Strait Islander peoples have harnessed the tremendous potential of plants, ingeniously using them for medicines, nutrition, to express culture and to develop innovative technologies. However, Aboriginal people, culture and deep knowledges are often seen as “in the past”, fixed and stagnant, with the broader Australian community often failing to recognise the depth and breadth of expertise. This article considers five examples that illuminate deep Aboriginal knowledge.



Bulbine lily. *Shutterstock*

Our land is burning, and western science does not have all the answers (*The Conversation: 19 Nov 2019*)



Patch burning in the Midlands region of Tasmania. The technique draws on traditional Aboriginal knowledge and can help in modern fire management. *Alan McFetridge*

Before white settlement, Aboriginal people were a constant presence in the landscape, and traditionally burnt country by walking the land. This meant they could control the timing and spread of fire, as well as its ecological effects. By contrast, most modern fire programs are far less flexible and responsive. They usually take place on weekdays in specific seasons and weather conditions. Many fires are ignited from the air – especially those in remote areas where vast areas of burning is desired. This technique results in bigger, more intense fires than those conducted by Aboriginal people. Aboriginal fire practice across Australia was severely disrupted by European invasion. The practice is being reinvigorated through initiatives such as

the [Firesticks Alliance](#), an Indigenous-led network involving training, on-ground works and scientific monitoring to better understand the ecological effects of cultural burning.

Australia lifts its performance on global mathematics and science test (*ACER: 8 Dec 2020*)

New results from the world’s longest running large-scale international assessment of mathematics and science, released today, show Australia has significantly improved its achievement in Year 8 mathematics and science, and Year 4 science – but not in Year 4 mathematics.

[Australia lifts its performance on global mathematics and science test - ACER Discover](#)

Wake up and smell the smoke (*National Indigenous Times: 13 Jan 2021*)



Wayne Davis, inaugural Traditional Fire Program Coordinator with the W.A. Department of Fire and Emergency Services, based at the Bushfire Centre for Excellence in Pinjarra. *Photo by Isabel Vieira.*

Professor of Pyrogeography and Fire Science at the University of Tasmania David Bowman said Australia is in a time of renewal in the way it manages land and bushfire practices. “Because we’re in a renewal we can use new techniques, we can adapt to climate change, we can adapt to landscapes that have been degraded by weeds by feral animals, we can adapt to landscapes that have been heavily cleared where we only have little pocket nature reserves,” Professor Bowman said. “We have all of these adaptive opportunities, let’s adapt and let’s innovate and let’s involve Aboriginal peoples in this.” Professor Bowman said Australia is still learning how to integrate Indigenous fire management practices. Wayne Davis agrees: “I think it’s critical that traditional and cultural burning practices and methodologies are embedded in contemporary fire management as an extra resource, tool or just knowledge in how to better manage Country.”

How to include Indigenous researchers and their knowledge (*Nature: 12 Jan 2021*)

In this article, researchers from Native American and other Indigenous communities explain how colleagues and institutions can help them to battle marginalization. Below is the contribution of one of our network members, Bradley MOGGRIDGE, Kamilaroi Water Scientist, Associate Professor in Indigenous Water Science, Centre for Applied Water Science, University of Canberra. Writing about this contribution on Facebook, Brad said:

*Yaama,
I was recently interviewed about my experiences as a Kamilaroi scientist, it was just published in an article in #Nature along with interviews with other amazing Indigenous scientists from around the world telling their stories. Our voice and knowledge is crucial to fix this place up for future generations #mykids.
Nature is the world's leading multidisciplinary science journals, that for me a nice early birthday present!*



Indigenous scientist Bradley Moggridge has used social media to push for equity in research. *Credit: Karen Moggridge*

BRADLEY MOGGRIDGE: Raise your voice to insist on Indigenous equity in STEM

Indigenous water scientist at the University of Canberra, Australia, and a member of the Kamilaroi Nation.

Being an Indigenous scholar is often a series of firsts. I was the first in my large extended family to graduate from university. I was the first Indigenous graduate from the environmental science programme at Australian Catholic University in Sydney. After getting my undergraduate and master’s degrees in water research, I worked for research agencies, including the Commonwealth Science and Industrial Research Organisation. I then led an Indigenous Australian water unit for the New South Wales state government to

highlight the cultural values of water. In 2016 I started a PhD at the University of Canberra, which I will finish soon.

Recruitment and retention of Indigenous scientists is an issue in academia. There's a troubling tokenistic aspect, almost like ticking a box, to having an Indigenous Australian on board. But this might be changing. There's now a concerted effort to encourage Indigenous children to go to university and to finish with a degree. It's a real challenge, however, to walk in two worlds. There are Western ways of learning, but you also have to maintain and protect Indigenous cultural integrity.

Most Australian universities have a reconciliation action plan (RAP), which lays out a series of targeted commitments to address race relations, equality and unity for Aboriginal and Torres Strait Islander communities. The University of Canberra's RAP is quite strong; it aims to attract, retain and support the graduation of Indigenous scholars, as well as keep them on track for a career path. In addition, the university is working to embed Indigenous perspectives and pedagogies into the curriculum and to establish an Indigenous research institute. We are improving, but still have a long way to go.

I encourage early-career researchers to establish a presence on Twitter. I have used it to pick worthy battles. For example, the Australian Academy of Science posted a picture of a group of white and Asian people at the academy that said something about the future of Australian research. I tweeted, "Are Australia's First Peoples allowed to be a part of that future?" It was a little dig, pushing them on what they would do next.

They came to me for a chat, and I joined an advisory group on how to move forward. That led to an anonymous donor committing to funding two annual travel grants of Aus\$5,500 (US\$4,200) for Aboriginal and Torres Strait Islander early- and mid-career researchers.

Many diverse and poorly represented groups in science are vying for funding and attention. We have to make sure we aren't overlooked.

'I spoke about Dreamtime, I ticked a box': teachers say they lack confidence to teach Indigenous perspectives (*The Conversation: 29 Apr 2020*)



Many teachers don't feel confident or capable to include Indigenous perspectives in their classrooms. In a recent study in a cluster of Australian primary and secondary schools, teachers were paired with Aboriginal community members to plan and deliver lessons. Initially, teachers reported feeling ill-equipped to genuinely include an Aboriginal perspective. One teacher said:

I've always felt that I wasn't very good at embedding Aboriginal perspectives in my lessons. It was always, for me, seen as a tick-box, and I spoke about Dreamtime, I ticked a box, and that's it [...] you didn't want to step on any toes, and you didn't want to offend anyone, so you just touched – you just skimmed the surface.

Teachers involved in the project had the best of intentions and a fierce willingness to learn. Some had been teaching for more than 20 years and openly admitted their ignorance towards Indigenous dispossession and the way schooling was used as a vehicle of colonisation.

Professor helps Indigenous communities tap into research rooted in their traditions



Dr. Shalene Jobin, Canada Research Chair in Indigenous Governance, is among 16 new or renewed CRCs at the U of A announced Dec. 16, 2020. *(Photo: John Ulan)*

As the newly named Canada Research Chair in Indigenous Governance, Dr. Shalene Jobin aims to develop a “research toolbox” to aid in the rebuilding of Indigenous nations. In her work, Dr. Jobin looks for innovations to revitalize Indigenous governance systems through the research process itself. “Indigenous nations thrived in complex systems of governance before Canada became a country—systems that remain in place even in the face of Canadian attempts to diminish them,” she said. “The dream is to develop a research toolbox with an assortment of Indigenous governance research methods that can be used to assist in the rebuilding of Indigenous nations.” That expertise has led to a number of successes, including Dr. Jobin being formally announced as a Canada Research Chair (CRC) in Indigenous Governance today.

School of fish: how we involved Indigenous students in our investigation of a 65,000-year-old site *(The Conversation: 22 Oct 2020)*



A recent program for school kids in Kakadu and West Arnhem Land, incorporating traditional knowledge and Western science, is a model for teaching Indigenous children on Country. The Djenj Project (djenj means “fish” in the local language) involved teaching Bininj (Aboriginal) children and rangers about fish, and scientific water research techniques, to improve employment opportunities.

Djenj Project Gunbalanya School Trip.
Photo: Lynley Wallis

Deadly science (*Chemistry World: 3 Sept 2020*)

Connecting science to community and culture



When Corey Tutt discovered that some Australian school libraries contained as few as 15 books, he felt compelled to do something to help fill their shelves. He took on a second job so that he could buy science books and early reading materials to send to remote schools across the country. Almost two years later, Tutt is continuing his mission in his role as chief executive and founder of Deadly Science.

Corey Tutt hopes to inspire more Aboriginal and Torres Strait Islander children to pursue careers in science. *Source: © Corey Tutt*

See Corey speak about Deadly Science and his personal journey:

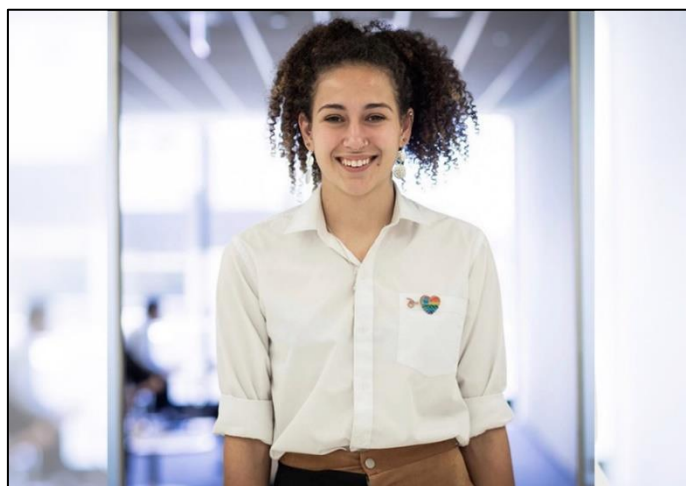
<https://www.facebook.com/TheProjectTV/posts/10157559048043441>

If you would like more information about Deadly Science, please view their brilliant new website:

<https://deadlyscience.org.au/>

Uni science student who's keeping her eye on prize (*National Indigenous Times: 3 Dec 2020*)

The Eureka Prize — known as the Oscars of Australian science — has recognised the Indigenous STEM Education Project's contribution towards increasing Aboriginal and Torres Strait Islander students' participation in science, technology, engineering and mathematics. The Indigenous STEM Education Project is building a pipeline of future STEM professionals — from primary through to high school — with the help of funding from the BHP Foundation and program delivery by CSIRO Education and Outreach.

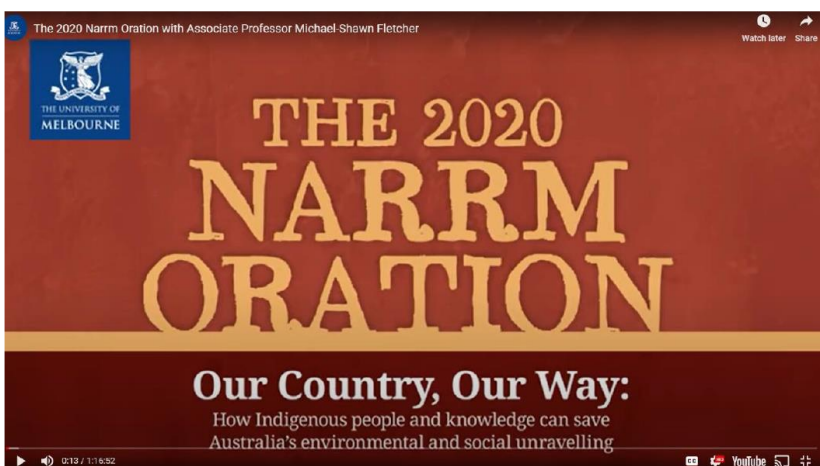


The project facilitates capability building through its complementary programs, such as: Science Pathways for Indigenous Communities, Inquiry for Indigenous Science Students, the Aboriginal Summer School for Excellence in Technology and Science (ASSETS) and the Indigenous STEM Awards.

Kaniyang Noongar woman Brittney Andrews (pictured above) said it was during the week-long ASSETS program that she became more confident to attend university as she was able to get a feel for the Indigenous support systems, connect with culture and meet Indigenous university students.

The 2020 Narm Oration: Our Country, Our Way

The Narm Oration is the University of Melbourne's key address that profiles leading Indigenous peoples from across the world in order to enrich ideas about possible futures for Indigenous Australia. *Narm* is the Woi Wurrung word for the Melbourne region. Delivered in October 2020 by ISN member Michael-Shawn Fletcher, Associate Professor Fletcher is a descendant of the Wiradjuri and a geographer interested in the long-term interactions between humans, climate, disturbance, vegetation and landscapes in the southern hemisphere with a particular emphasis on how Indigenous burning has shaped the Australian landscape. He is Director of Research Capability at the Indigenous Knowledge Institute, Assistant Dean (Indigenous) in the Faculty of Science at the University of Melbourne, and a panel member of the Australian Research Council College of Experts.



The 2020 Narm Oration is entitled: **Our Country, Our Way: How Indigenous people and knowledge can save Australia's environmental and social unravelling.** Australia is in the midst of both environmental and social crises. With the highest rate of biodiversity loss on earth, the country is facing an ever-increasing barrage of massive catastrophic wildfires that wreak untold environmental damage and its First Peoples are among the most disadvantaged and disaffected

demographic. In the 2020 Narm Oration, Associate Professor Fletcher will argue that many of Australia's current environmental problems can be traced to the impact of British invasion and the violent and devastating effects this has had on Aboriginal and Torres Strait Islander peoples. Embedding the Aboriginal world view and notion of Country into mainstream Australia has the potential to benefit the lives and livelihoods of all Australians and our Country.

How drones and ancestral indigenous knowledge are saving the Amazon

(The Hill: 15 Jan 2021)



Raoni and English singer Sting in Paris (France) - April 1989 *Wikimedia Commons*

British rock artist Sting might seem like an unlikely ally in the fight against deforestation in the Amazon. But when he first met Raoni Metuktire, a chief of the Kayapo indigenous peoples and environmentalist in 1987, he believed what researchers would confirm years later: the people who can save the rainforests are those who live in them. What works is supporting indigenous leadership with more modern technologies, which are getting increasingly user-friendly and cheap. Using drone technology and publicly available satellite data, local technicians are able to monitor the forest and send information directly to indigenous communities, who decide how to handle threats using the knowledge they've gleaned over the years from their connection to the forest and land.

David Unaipon – a great Australian Indigenous scientist (AIATSIS: accessed 26 Jan 2020)



Every Australian should know the story of this gifted Aboriginal scientist, who was born on a mission in South Australia in 1872 and lived until 1967. He spent his life investigating, creating and promoting his people and culture. Best known for the invention of mechanically powered rotary shears to

massively improve hand-operated shears, he also studied the flight of the boomerang to suggest a flying machine similar to the helicopter! Sadly, due to the racism of the time, he made no income from this highly significant invention (see diagram below) as he was unable to get financial backing to develop his ideas. And yes, if you are not from Australia, his story is featured on our \$50 note (pictured above).

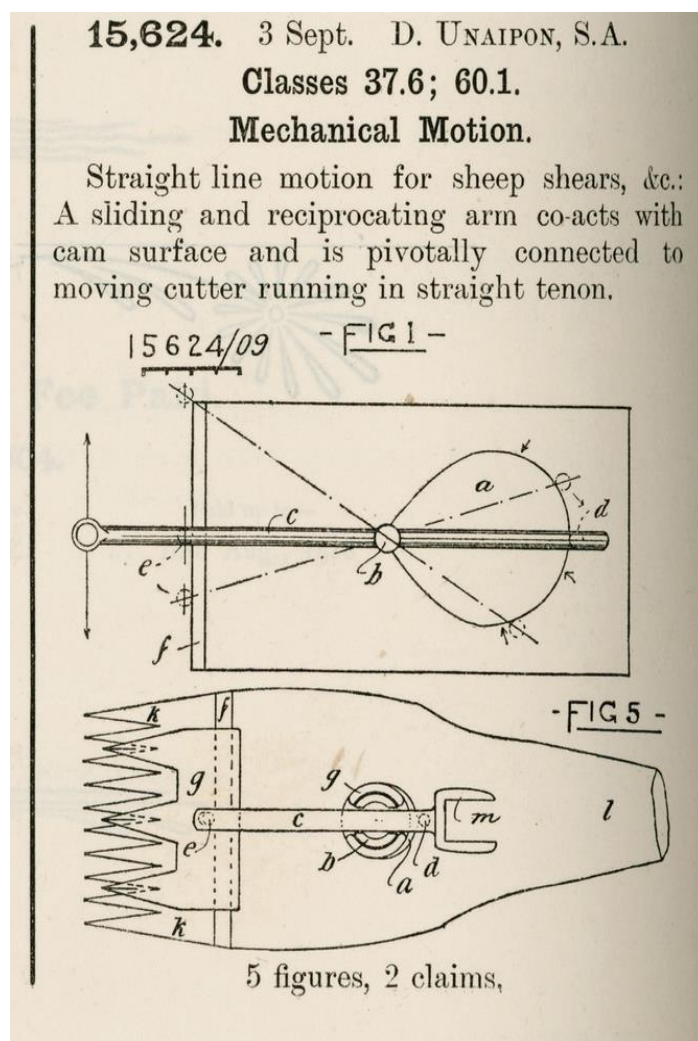
David Unaipon was a great Australian, one of this country's finest thinkers and creatives who shone brightly in a world of adversity. A gifted man with a thirst for knowledge, he was an inventor, writer, orator and campaigner. He spent much of his life transforming the minds of all, in the hope that one day his people - Aboriginal people would be seen as equals.

Apart from his inventing, Unaipon became the first Aboriginal writer to be published. His earliest published works include articles entitled 'Aboriginals: Their Traditions and Customs' in the Sydney Daily Telegraph (2 August 1924) and 'The Story of the Mungingee' in The Home magazine (February 1925). By 1929, when he gave evidence to the Bleakley Inquiry into Aboriginal welfare, he was the most well-known Aboriginal person in Australia!

Unaipon was undoubtedly a brilliant Australian. His flashes of brightness flicker long after his passing. His wisdom and passion to educate himself and others was profound. He was a thinker, driven to make a difference to the lives of all Australians.

DAVID UNAIPON – TOO DEADLY!!

To view a recent video presentation that explains the importance of his shearing tool invention to the Australian wool industry, please click this link: [David Unaipon: Australia's Da Vinci](#)



Member Feedback

In order to encourage participation, we would like to provide a section of each Bulletin for member feedback. If there are any items in this issue that you would like to comment on, please send your feedback to the Coordinator ISN at **IndigenousSciNet@yahoo.com**. The return of the Indigenous Science Network Bulletin after a three-year hiatus was well received by many. Following is a selection of messages received via email, Twitter or Facebook after distribution of the Bulletin in October last year.

*Congratulations, Mark & Michael. Fantastic to receive this edition – well done to all the contributors and thank you for sharing so much with us! **Robyn Bull** | Director – Wonder of Science, UQ Graduate School | The University of Queensland, AUSTRALIA*

*Dear Mark, Thank you for being willing to help with this important IK bulletin. Appreciated your time and efforts. I am looking forward to receive the next edition. **Emilia Nhalevilo**, Professora Associada, Universidade Pungue, MOZAMBIQUE*

*Hello Mark. Good on you for taking over the distribution of Indigenous Science Magazine. **Bill Bean**, USA*

*Thank you for your effort. **Ridvan Elmas**, Afyon Kocatepe University, TURKEY*

*Dear Mark. Many thanks for taking on the task of reviving the ISNB. Prof. **Ray Norris**, School of Science, Western Sydney University & CSIRO Astronomy & Space Science, AUSTRALIA*

*Dear Mark, Really valuable! Thank you. **Michael J. Reiss**, Professor of Science Education, UCL Institute of Education, London, UNITED KINGDOM*

ISN Facebook page and Twitter account

In renewing this Network, a Facebook page and Twitter account have been created. The Facebook page has around 330 followers and the Twitter account has around 750 followers (as at 10Feb21). This is quite encouraging, as both media have only been live since early August 2020. Many people are occasional users of Facebook, so I am hoping that Network members will access our page and become official followers.



Items posted on Facebook so far have focussed on Indigenous science, environmental, welfare and equity issues. More pointedly, the Twitter account covers many Indigenous issues, much more than just science and has contributions from First Nations peoples of all settler countries. If you are not yet a Tweeter, I would encourage looking into it. The Coordinator of this Network, Mark Linkson, has been running both these media but would be happy to share the load with other members if you are keen. We could loan the accounts out a week at a time. Let me know! The logos above contain hyperlinks to our live and continuing everyday media presence. However, the Bulletin is our most important and significant work, the ephemera of social media is but a fleeting fancy, although some of the issues and stories that first crop up on social media do translate to future stories in the Bulletin.

RESOURCES

Teaching Chemistry in a Pandemic

Michelle Hogue (PhD) is Associate Professor & Coordinator Indigenous Student Success Cohort (ISSC) with the University of Lethbridge in Alberta, Canada. In the following article, she explores the challenges of teaching chemistry via remote methodologies to Indigenous students. She hopes to present a follow-up article at a later time to further evaluate these experiences. She is also an ISN First Nations Co-Editor.



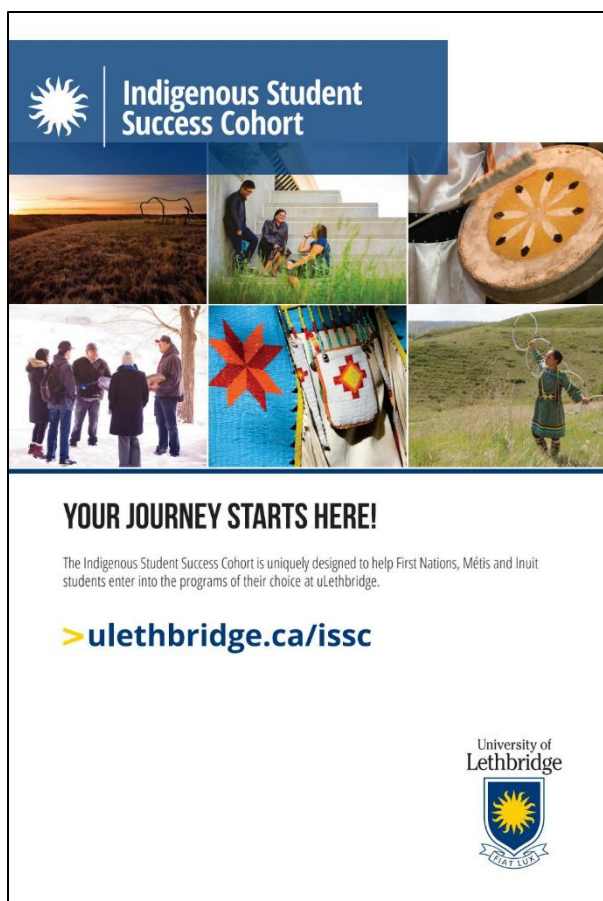
The Indigenous Student Success Cohort (ISSC) program at the University of Lethbridge (UofL) in Alberta, Canada is a well-recognized, successful first-year program that provides a solid academic foundation and skill set to enable Indigenous students to succeed in their degree of choice. Key to the success of the ISSC, is the bridging of Indigenous and Western cultures, the creation of community, a culturally relevant, highly interactive, learning and supportive environment, and attention to Indigenous Ways of Knowing and Learning (IWKL). Students take a core set of foundational courses in the fall semester as a cohort and a smaller core in the spring as well as other selected mainstream courses while still having the supports of the program and a cohort. Our statistics show that Indigenous students who enter university through this program are retained to graduation at a 10% higher rate than any student (Indigenous or not) who enters through the traditional mainstream way. As such, the ISSC has become a model for other cohort programs at the UofL.

When the Covid-19 Pandemic hit in March, 2020, schools and universities suddenly closed and we scrambled to go online in a matter of days. This had a negative impact for many students, but particularly Indigenous students, many who had to move back to community and complex living situations. There was

little time to plan and there were many challenges in completing courses. It was stressful for all; students and professors alike. It soon became evident that this was going to be the “New Norm” for post-secondary education for the 20/21 academic year. As the Coordinator of the ISSC, I know first-hand the struggles and challenges Indigenous students experience with the Western way of learning, particularly in transitioning into mainstream university education at the best of times, so deciding how to deliver the entire program online was a deep concern. To say it has been a challenge would be an understatement.

Science courses, in general, for Indigenous students pose the greatest academic roadblock largely because the content and the way they are traditionally taught in the Western-Eurocentric education system do not align with IWKL. So most Indigenous students avoid the sciences and mathematics if they can, or they are streamed away from them (a whole other political topic) even before university, thus they don't have a solid foundation coming in. One of the courses I teach in the ISSC is chemistry, a course with historically high attrition and poor success; problems I had been battling from the time I was

seconded into the program. I found that the greatest attendance, engagement and success was in the



YOUR JOURNEY STARTS HERE!

The Indigenous Student Success Cohort is uniquely designed to help First Nations, Métis and Inuit students enter into the programs of their choice at ulethbridge.ca

ulethbridge.ca/issc

University of Lethbridge

practical laboratory component. So some time ago, I decided to move away from the traditional and ineffective textbook-lecture way of teaching chemistry, write my own materials and teach the course entirely in the laboratory from a hands-on practical methodological approach. The philosophy of the course is “let’s-do it first and talk about it later”. The goal was to address the issue of context and relevancy that was missing for Indigenous students in the traditional approach so that once they have that, creating bridges to the theory becomes much easier. As a methodological approach, it has been very successful at engaging and retaining students in my chemistry course, and many have even pursued further science-related pathways such as nursing and environmental science.

With the New Norm and online delivery, the greatest challenges are the science courses. While not ideal, the theory can be taught in an online format either synchronously or asynchronously, but the practical laboratory component is a much greater challenge. Certainly, one can Google or find YouTube videos to illustrate particular techniques or experiments, but that is not the same as actually doing the work. It’s like learning to ride a bicycle; you can read all you want about how to ride one, but it is a completely different experience to actually try to learn it in the real, and if you don’t even know what a bicycle is, then you have an even bigger issue. In the fall semester, we offer biology and the instructor opted for asynchronous lessons and on-line labs. The students struggled with both the asynchronous nature of the lectures as well as with the online labs. In the end, the attrition rate was more than half and the final grades significantly lower than the norm. In general, last term, throughout the program we found asynchronous course delivery to be a great challenge for most Indigenous students who need the relational engagement, even if in an online environment.

When we abruptly went online in March 2019, I really scrambled to move a “practical hands on” course to an online format. I managed to find relevant videos to illustrate the concepts I was teaching and taught synchronously when students could either access the internet or had time in their now very complicated living conditions. We made it to the end of the semester but it really wasn’t a good experience for anyone. Fortunately, to protect student grade point average (GPA), the university saw it fit to allow students to choose to either take a credit (CR) or the grade for a course they passed and a non-credit (NC) for a course they were not successful in.

A year later, we are now into the second semester and I have puzzled long and hard about how to teach my chemistry course – how to move a totally practical hands-on course to an online environment and maintain the integrity of the course and the student experience. I know asynchronous isn’t working for the students so live teaching is critical and it is really the only way I am an effective teacher. So that is what I have opted for and providing my own materials in weekly folders in our Moodle platform. But how to have a laboratory component has been a challenge. My students are now scattered into community and in remote areas so having lab kits assembled and shipped to them is not really feasible. Many are now working in and amongst small children and are in overcrowded homes, so one also has to factor in safety and liability. So, I’ve opted for the kitchen and the land (wherever they are located) as the laboratory environment and we are exploring kitchen chemistry and will hopefully move into environmental chemistry when the weather warms up. I’ve created a materials list and all supplies can be purchased inexpensively from a local dollar store. While it might not look like traditional chemistry, it seems to be working. Yesterday we explored density and concepts of concentration by building density columns using household items such as sugar, water, and food coloring. It is a collaborative work in progress and we are co-learning together. So....stay tuned.

ISN members are encouraged to submit similar items as the above and following (Using Kriol to Learn Biology). As the Bulletin is not an official journal or organ of any recognised institution, we are not required to enforce any formatting, editing or reviewing regimes. We do have an Advisory Board made up of the currently eight First Nations Co-Editors who view all items before publication. If you are doing something valuable in Indigenous science, teaching or education, please consider telling your story here!

USING KRIOL TO LEARN BIOLOGY

Reflections by **Genevieve Firmer**

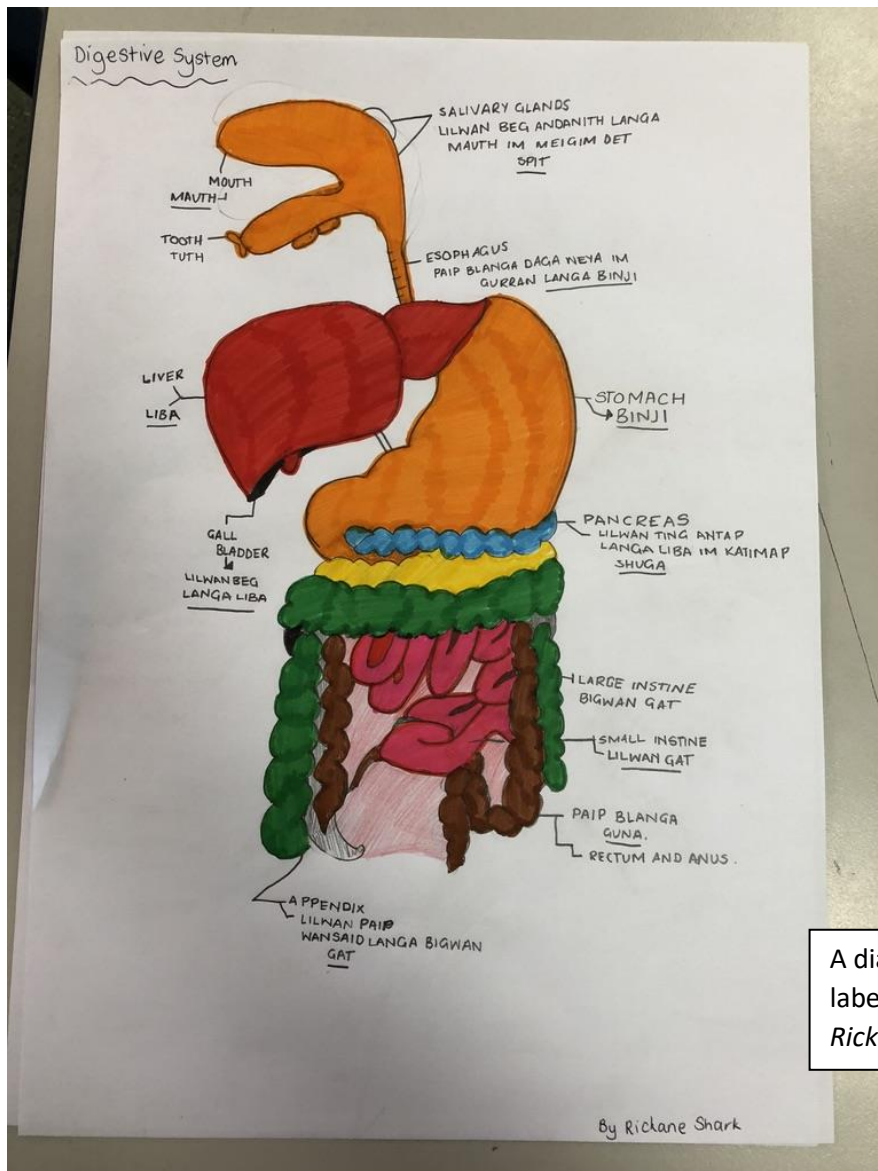
Kriol resources by **Rickane Shark** and **Edwina Murphy**

Genevieve is a senior secondary teacher specialising in Chemistry and Biology. She recently taught Aboriginal students in the Northern Territory and is now working on a Masters of Philosophy in Science, focussing on secondary Chemistry education, with the University of Sydney. Rickane and Edwina studied with her.



In 2019, I worked together with two of my Year 11 students at Katherine High School in the Northern Territory, Rickane Shark and Edwina Murphy, to create health resources in Kriol as part of an assessment on science communication. These resources were developed on the digestive, cardiovascular, excretory and respiratory systems and diabetes, rheumatic heart disease and kidney failure.

This experience provided an opportunity to bring Indigenous languages into schools. In this project, we observed increased interest, engagement, understanding of scientific concepts, improved written language skills and improved English vocabulary.



Rickane and Edwina both reported that learning in Kriol helped them understand to the human body in more depth and supported them to learn some new words in English.

They were particularly able to understand ideas about microscopic systems such as the nephron (a microscopic part of the kidney which filters blood) and dialysis (the medical procedure in which an external machine filters blood in the place of the kidney) in more detail, once it had been translated into Kriol.

The students created a poster on the digestive system which we mounted on the classroom wall. We later spotted younger Kriol-speaking students reading the resources – students who are normally hesitant to read in English.

A diagram of the digestive system, with labels in English and Kriol. *Created by Rickane Shark and Edwina Murphy.*

Rickane and Edwina feel strongly about the importance of creating resources in language, in order to help the whole community to understand key health issues. Discussions are beginning to emerge about de-colonising science communication, and it is clear that Indigenous youth can and should play a role in this conversation and shaping science communication for their communities and the global community into the future. The shift of the curriculum towards recognising the importance of communication in science allows teachers to design explicit learning activities about science communication across cultures in the science classroom.

We would love to see other students build on these resources over time. Please feel free to contact me through the site linked below if you are interested in this work.

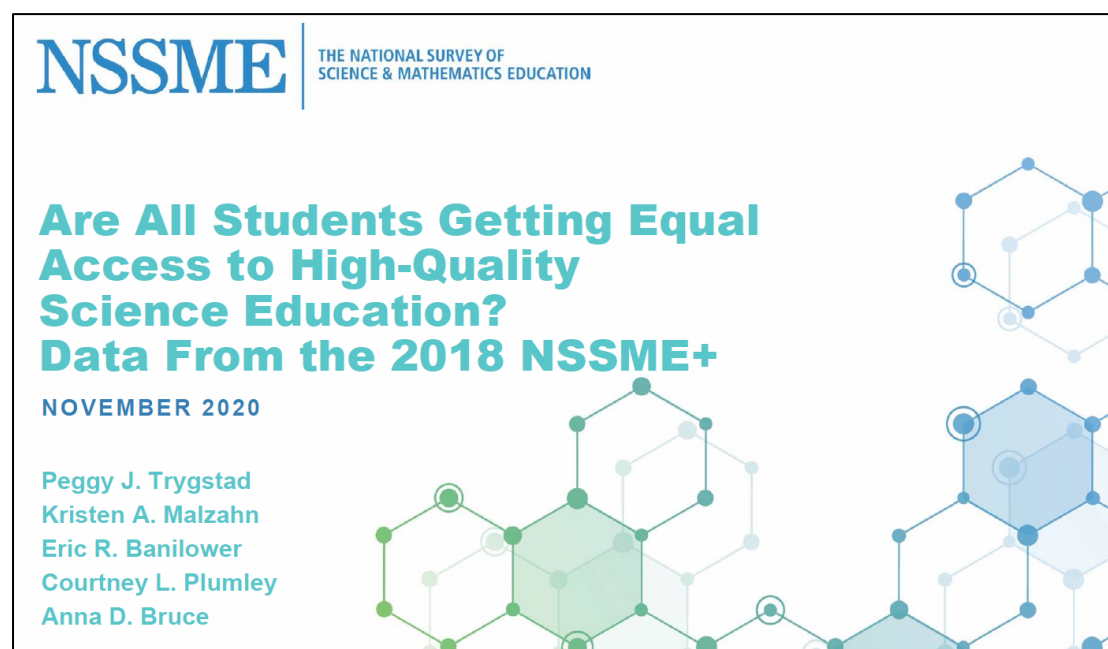
Read my reflection about the experience and take a look at the resources they created here: (<https://gfirmer.github.io/Chemistry-teacher/Kriol-Biology>).

View or download the resources Edwina and Rickane created here: (<https://github.com/GFirmer/Chemistry-teacher/blob/master/Supporting%20materials%20The%20Human%20Body%20in%20Kriol%20and%20English.pdf>)

References

HANCOCK, R., MARTIN, B., LEE, A.-M., WILLIAMS, D., PONTO, H., THOMPSON, A., ANGELO, D. & GUMBULI, M. 1995. Health - An Aid for Kriol Interpreters. Katherine: Katherine Regional Aboriginal Language Centre.

2018 NSSME+ Equity Reports (National Survey of Science & Mathematics Education, USA)



These reports focus on the equity of students' access to high-quality science and mathematics education. Although not designed primarily as an equity study, the 2018 NSSME+ provides data on some indicators of the extent to which students across the nation have equitable educational opportunities. To this end, data from the study were analyzed by four factors historically associated with differences in educational opportunities. When possible, data from the 2018 and 2012 studies were compared to examine whether the magnitude of differences between groups changed across the two time points.

Launch in Australia of an exciting new series of books on First Knowledges

It is with some pride that the ISN has been asked to publicise the launch of a series of books that concern themselves with Indigenous knowledges including science and related areas. We were contacted last year by one of the authors and ISN member, Lynne Kelly, who sought to gauge our interest in this work. We were of course very interested! Below is her summary of the series. We are also very pleased to note a number of other ISN members who are involved in this initiative. You are encouraged to seek out these resources as they become available.

Lynne writes:

The National Museum of Australia has teamed up with Thames & Hudson Australia to publish The First Knowledges series of books. Although suiting a broad audience, the series is particularly designed for education, offering teachers and students a practical resource for addressing Indigenous knowledges in the classroom. The books will explore practices such as architecture and design, land management, medicine, astronomy and innovation. The series brings together two very different ways of understanding: one ancient, the other modern. The first book in the series has now been published.

Songlines: the power and promise is co-authored by Margo Neale, senior Indigenous curator at the National Museum of Australia who, with Aboriginal elders, curated the incredibly successful exhibition *Songlines: tracking the Seven Sisters*. Her co-author is educator and science writer Lynne Kelly, author of *The Memory Code* and *Memory Craft*.

<https://thamesandhudson.com.au/product/songlines-the-power-and-promise/>

Songlines: the power and promise has been shortlisted for the Victorian Premier's Literary Awards and nominated for the Booktopia Favourite Australian Book Award for 2020. Results are pending.

Forthcoming titles include:

Design: Building on Country by Alison Page & Paul Memmott (2021);

Country by Bill Gammage & Bruce Pascoe (2021);

Astronomy by Karlie Noon & Krystal De Napoli (2022);

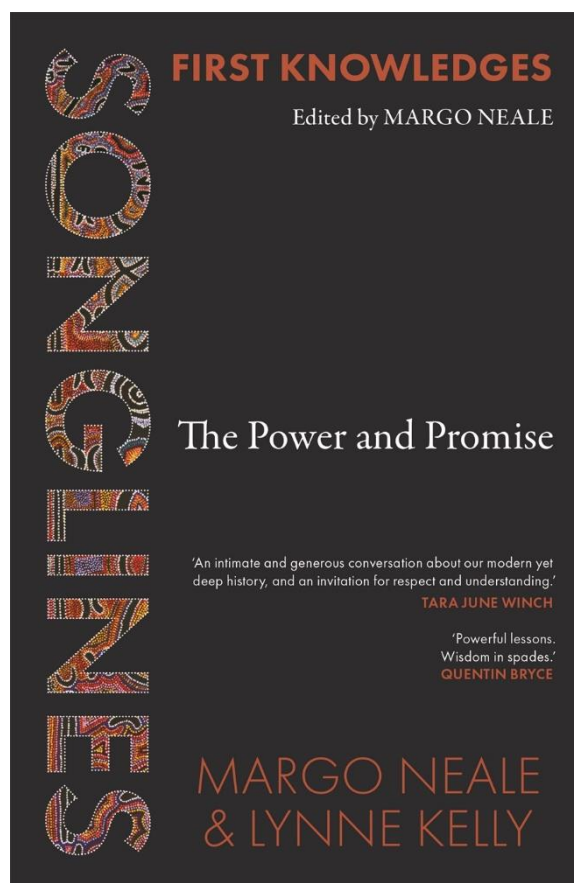
Plants by Zena Cumpston, Michael Fletcher & Lesley Head (2022);

Innovation (2023).

'Let this series begin the discussion.' Bruce Pascoe

'An act of intellectual reconciliation.' Lynette Russell.

Songlines are an archive for powerful knowledges that ensured Australia's many Indigenous cultures flourished for over 60,000 years. Much more than a navigational path in the cartographic sense, these vast and robust stores of information are encoded through song, story, dance, art and ceremony, rather than simply recorded in writing. Weaving deeply personal storytelling with extensive research on mnemonics, the book offers unique insights into Indigenous traditional knowledges, how they apply today and how they could help all peoples thrive into the future. This book invites readers to understand a remarkable way for storing knowledge in memory by adapting song, art, and most importantly, Country, into their lives.



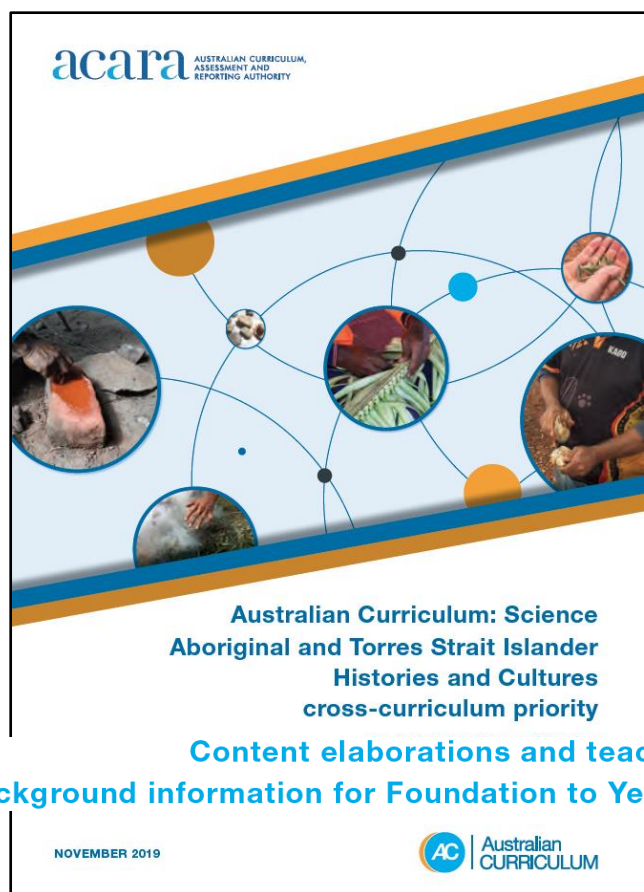
Indigenous science elaborations for teaching the Australian Science curriculum (2018)

Although this is not news to any teachers in Australia, we have included this item as it may be of interest to our international members (and we were offline in 2018). In response to feedback from community and educators, ACARA (the Australian Curriculum Assessment and Reporting Authority) on 18 October 2018 released 95 elaborations to support teachers to incorporate Aboriginal and Torres Strait Islander Histories and Cultures into teaching the Australian Curriculum: Science for Foundation to Year 10.


[ACARA Media Release on Science Elaborations](#)

[F-10 Australian Curriculum: Science Elaborations for the Aboriginal and Torres Strait Islander Cross-curriculum priority](#)

<https://www.australiancurriculum.edu.au/f-10-curriculum/cross-curriculum-priorities/aboriginal-and-torres-strait-islander-histories-and-cultures/>



In co-operation with many of Australia's Indigenous communities, one of our First Nations Co-Editors, Joe Sambono, was responsible for the gathering, negotiation and creation of these 95 elaborations. Joe has indicated that he would like to write about this process in the next issue of the ISN Bulletin. Should be very valuable for anyone interested in the authentic use of Indigenous knowledge in science teaching.



Year 4

In Year 4 Science, students broaden their understanding of classification and form and function through an exploration of the properties of natural and processed materials. They learn that forces include non-contact forces and begin to appreciate that some interactions result from phenomena that can't be seen with the naked eye. They begin to appreciate that current systems, such as Earth's surface, have characteristics that have resulted from past changes and that living things form part of systems. They understand that some systems change in predictable ways, such as through cycles. They apply their knowledge to make predictions based on interactions within systems, including those involving the actions of humans.

STRAND – SUB-STRAND

CONTENT DESCRIPTION

CROSS-CURRICULUM PRIORITY ELABORATION (NEW ELABORATIONS IN BLUE)

SU
Biological sciences

Living things have life cycles (ACSSU072)

- investigating how Aboriginal and Torres Strait Islander Peoples understand and utilise the lifecycles of certain species

SU
Biological sciences

Living things depend on each other and the environment to survive (ACSSU073)

- recognising how Aboriginal and Torres Strait Islander Peoples perceive themselves as being an integral part of the environment

SU
Chemical sciences

Natural and processed materials have a range of physical properties that can influence their use (ACSSU074)

- considering how Aboriginal and Torres Strait Islander Peoples use natural and processed materials for different purposes, such as tools, clothing and shelter, based on their properties

SU
Chemical sciences

Natural and processed materials have a range of physical properties that can influence their use (ACSSU074)

- considering how Aboriginal and Torres Strait Islander Peoples' knowledge of natural and processed materials informs the preparation of effective, vibrant and long-lasting paints

SU
Earth and space sciences

Earth's surface changes over time as a result of natural processes and human activity (ACSSU075)

- considering how Aboriginal and Torres Strait Islander Peoples' fire management practices over tens of thousands of years have changed the distribution of flora and fauna in most regions of Australia

Videos that explore Indigenous science

Many useful presentations are available on the net. Members are encouraged to submit any they are aware of for future bulletins. We will highlight a few in each bulletin going forward. Here are some:

[Native and Western Science: Possibilities in a Dynamic Collaboration](#)

Leroy Little Bear, a member of the Blood Tribe of the Blackfoot Confederacy (Canada), speaks about science through the lens of Native American culture and teachings. He outlines several tenets of this lens and discusses how we might use them to overcome obstacles reached in the scientific community. These tenets are constant flux, renewal, and place. He also discusses the tendency for a focus on interconnectedness and the larger picture in Native culture versus the focus on individualism and the individual parts in Western culture and the part this plays in studying science. **(10 May 2011)**

[Indigenous Knowledge and Western Science: Dr. Gregory Cajete Talk](#)

Dr. Gregory Cajete, Director of Native American Studies at the University of New Mexico, explains how Indigenous physicists not only observe the world, but participate in it with all his or her sensual being because everything in native thought is “alive” with energy. Cajete was speaking to an attentive audience at The Banff Centre as part of the Indigenous Knowledge and Western Science: Contrasts and Similarities event. **(15 Jan 2015)**

[Indigenous Knowledge and Western Science: Dr. Leroy Little Bear Talk](#)

Indigenous academic Leroy Little Bear compares the foundational base of Blackfoot knowledge to quantum physics to an attentive audience at The Banff Centre as part of the Indigenous Knowledge and Western Science: Contrasts and Similarities event. **(14 Jan 2015)**

[The case to recognise Indigenous knowledge as science | Albert Wiggan | TEDxSydney](#)

In this passionate talk, Albert Wiggan calls for better recognition from the scientific community arguing that Indigenous knowledge is science and that's what we should call it. Albert Wiggan is a Bardi-Kija-Nyul Nyul man from the beautiful waters of Boddergron (Cygnet Bay) on the Dampier Peninsula, who is passionate about culture, country and Indigenous science. **(16 July 2019)**

[Indigenous Knowledge and Western Science: Rob Cardinal Talk](#)

Astronomer Rob Cardinal outlines how the idea of everything being inter-related is becoming more of a discussion in western science recently (albeit quietly), but has been talked about for millennia in Indigenous thought. Cardinal, a research associate at the University of Calgary and Executive Director of The First Light Institute, was speaking to an attentive audience at The Banff Centre as part of the Indigenous Knowledge and Western Science: Contrasts and Similarities event. **(15 Jan 2015)**

Polynesian Ancestral Knowledge Webinars (27 episodes)

A most inspiring resource of 27 webinars recorded throughout 2020, looking at many aspects of Polynesian ancestral knowledge related to such Indigenous science concepts as creation stories, stars, solstices, navigation, winds, constellations and equinoxes (plus other topics). Presenters are all Polynesian academics from First Nations peoples of places such as Hawaii, Tonga, Tahiti, Samoa and Aotearoa (New Zealand).

Each webinar is hosted by Dr. Lilikalā Kame'eleihiwa from the Kamakakuokalani Center for Hawaiian Studies, within the [Hawai'i inuiākea School of Hawaiian Knowledge](#) . She writes that:

Aunty Gladys Kamakakuokalani Brandt left a legacy to the Kamakakuokalani Center for Hawaiian Studies, that proudly carries her name, to establish the Brandt Chair for Comparative Polynesian Studies.

We are doing a weekly Webinar series on Polynesian Ancestral Knowledge. We are hosting scholars every week from many parts of Polynesia to share their knowledge. All webinars are presented in English and will be translated simultaneously into French.

The homepage for all the webinars is linked to the image on right.



Podcast: On Embracing Native Culture in Alaska

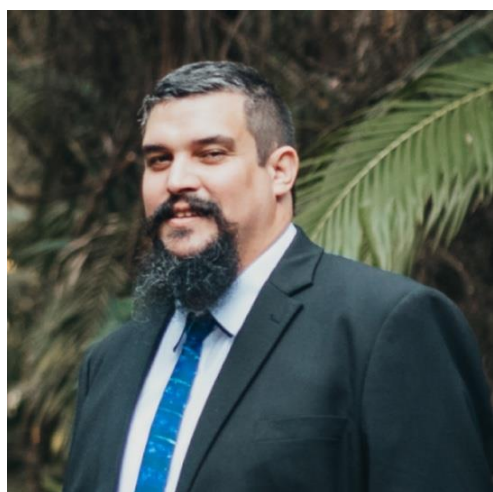
Danielle Riha teaches middle school at the Alaska Native Cultural Charter School in Anchorage. Before moving to the city, she worked on the slime line and taught Indigenous populations in rural Alaska. When she was asked to help start a charter school, she and her colleagues worked with parents and elders in the community in order to design a curriculum that would best suit the students' needs. Danielle is passionate about equity, Indigenous languages, and culturally relevant lessons that help students engage with their learning. She was the Alaska Teacher of the Year and one of four finalists for the National Teacher of the Year Award in 2019.

My kids were having a real hard time with literature and the elements of literature. So I brought in elders to tell traditional oral stories. Because kids were getting hung up on vocabulary, like a screen door and a curb and just things that they didn't have any life experiences with. And then I also worked with Jerry Lipka and Yup'ik elders on designing math and the cultural curriculum, which is subsistence—things like fishing or building kayaks, different types of boats; what you need to subsist and live off the land. There's so much math and science in it. And we turned the practices into math and science lessons that were relevant to the students.



In some rural areas in Alaska, four wheelers and snow machines are more common than cars. Life in rural Alaska differs greatly from that in a city like Anchorage. By incorporating more relatable topics and stories into word problems and reading exercises, Danielle learned to teach more effectively.

Kooriculum™ Indigenous Science Program



Mick O'Loughlin, Education Officer with IndigenousX, explores Indigenous science and how it can be taught more meaningfully through use of the Kooriculum science resources for primary schools:

Culture, science and education are three of my key passions and have been as long as I can remember. To me, these are a logical combination – culture provides the lens through which we see the world, science the knowledge, and education how we share both.

It wasn't until I got older that I realised there were people who believed that 'science' and 'culture' (Indigenous culture at least) didn't go together. They imagined a world where science was solely the realm of white people, and 'culture' was a loose term combining all the spiritual and superstitious elements they imagined Indigenous cultures to contain. This is a painfully shallow understanding that not only misses the beauty and genius of Indigenous knowledges, it fundamentally misunderstands the nature of humanity.

How to handle Australia Day issues with Indigenous kids: an Indigenous kid offers her ideas (useful for any teachers of Indigenous students)

For those network members who live in Australia, you would have recently seen and heard a tremendous amount of informed and/or misguided media and social media commentary on the Indigenous position regarding the national day of celebration, Australia Day. Which is now celebrated each year on 26 January, but hasn't always been. For most Aboriginal and Torres Strait Islander peoples, January 26 is better referred to as Invasion Day or Survival Day. It is a time of mourning to remember the confronting stories of colonisation, murder and dispossession that followed the arrival on Eora country (now Sydney) of Captain Cook and his cargo of British convicts in 1788. Each year many thousands of Australians take to the streets to demand the celebration ceases. It is a highly stressful time for our First Nations peoples.



Protestors at an Invasion Day rally in Brisbane last year. 'Truth-telling is happening at the ground level, and it is happening first and foremost with black families.'

Photograph: Darren England/AAP



Mabel, a young Indigenous girl on Kurna country (Adelaide) runs an initiative called "Undercover Kindness" which fundraises and sends care packages to remote living Indigenous children. She also runs a [Twitter account](#) and recently responded to the Australia Day stress by offering some tips on how best to respond with Indigenous kids. She is wise beyond her years. Teachers with Indigenous students, please take note. This is what she wrote:

In the days coming up to January 26 it can be super hard for us Nunga kids. If you would like to spread kindness not hurt at this time of year here is a few things you can do to show kindness to us kids:

Mabel sends another big parcel of goodies off to a remote area op shop!

1. If you are a teacher, think about what you are teaching us kids. Stop saying Cook discovered this country. Stop being gammon & acting like white fullas peacefully settled here. Tell the truth because when you don't it hurts us more & your job is to keep all us kids safe.

2. Buy Aunty [@amymcquire](#)'s new book. It's so deadly and makes my day happy when I think of all the work Blak Aunties do to make things better for us kids (see next Bulletin story below).

3. When you are travelling anywhere on this land find out whose country you are travelling on or staying in and tell your kids. Then you all can respect our country and move around more respectfully and much more kinder.

4. Stop spreading bad stereotypes of us mob and our parents and our uncles and aunties. We are deadly mob and when you call us names and stuff it hurts us and makes us feel negative towards you. Also the stereotypes aren't true.
5. Buy from all our Black businesses. We have so much to share and to offer people. Please support us all year around not just during Reconciliation Week. I love my family's website [@RevolutionWare](#) and [@DeadlyScience](#) and my mum loves [@flashblak](#) and [@NunkerID](#) and [Haus of Dizzy](#)
6. Stand up to racists. It's not the job of us kids to defend our mob in the classrooms or school yard. Racists are not our people, they are your people, you are responsible for them, not us.
7. Stop locking up our family. When you take our mob away from us because you say they are criminals it hurts our hearts and leaves the biggest gap in our homes and our families and our communities. And stop killing our aunties and uncles when you lock them in your cages.
8. Don't buy Australia Day stuff at the shops and don't have Australia Day parties. I'm a kid but even I know that you shouldn't celebrate killing people. It's so wrong.
9. Support Aboriginal kids knowing their culture. Stop trying to make us white. Let us speak our language, do our business and go onto country. We need to be on our land, in our waters and with our mob.
10. Listen to Aboriginal kids. Everyone ignores us but we've got a load to say. We are the future of our people and with us, this country has a Black past and a Black future.

And just be kind. Don't be racist. And don't write mean comments on people's posts or send them racist messages. (And my Mum always says we should check in on all our Nunga friends and Elders around this time of year because we get sad and tired of all the Australia Day stuff).

Regarding her project Undercover Kindness, Mabel sent us these words:

My name is Mabel and I am 11 years old. I am a Guditjmarra, Boandik, Ngarrindjeri and Maori kid living on Kurna country. I have a project called Undercover Kindness which I started with my Mum. Our family believes that in a world where you can be anything, that you should choose to be kind. I coordinate lots of different kindness activities from small things like painting kindness rocks and sending people Happy Mail to organising clothing donations to remote area op shops, Happy Boxes for my sistas living remote and little packs of comfort for mob sleeping rough. This country can be unkind to mob so I want every single one of my cousins, brothers, sisters, aunties, uncles and all of my Elders to know that they matter, that they are loved and that no matter where they are or what they are doing that I am so happy they exist. We can all do our bit to make everyone feel wanted...and kindness doesn't even have to cost a cent!

You can follow me on Twitter, Instagram or Facebook and can see my page on my family's website:

<https://www.therevolutionware.com/undercover-kindness>

Thanks for reading and remember to be kind!!!

Australian curriculum needs to teach 'true history' of January 26 (ABC News: 26 Jan 2021)

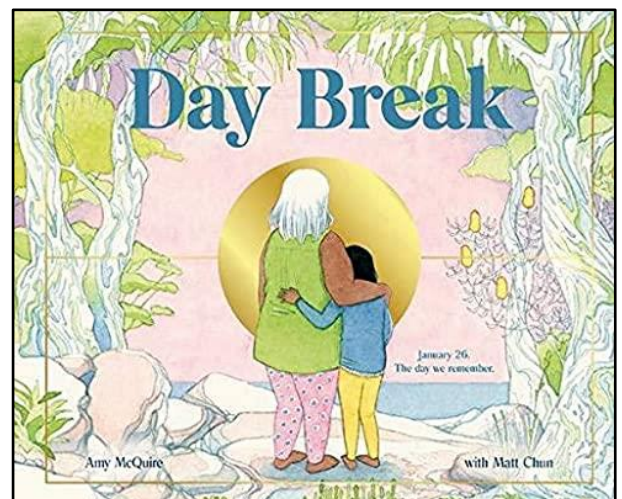


This is the author and book that Mabel from Undercover Kindness suggests that everyone become familiar with in Tip No.2 above.

Growing up, Amy McQuire struggled to find herself in picture books about Australia's history. When the Darumbal and South Sea Islander mother searched for Indigenous-centred stories to teach her own young children Elara and Leland about January 26, she found none. With the next generation in mind, the journalist and academic joined illustrator Matt Chun and created Day Break. The children's book tells the story of a family making their way back to country on January 26. "It's for all children, but it's particularly for Aboriginal children to be able to see themselves," McQuire said. "The next generation growing up, knowing their true history and learning it particularly from an Aboriginal perspective is going to be really important."

Darumbal and South Sea Islander author Amy McQuire says she feedback about the book has been positive. (Supplied: Amy McQuire)

The PhD candidate said the storyline was inspired by her experience of attending dawn services in Melbourne. "Mob get around just to remember what happened on January 26 but also afterwards in relation to the successive invasions of Aboriginal lands and all of the trauma that came afterwards," she said. "Then I started to think, 'If you're not in a capital city you can't attend a protest, what do mob do?'. "So it became about a family holding their own ceremony on this day and it contrasts it with what non-Indigenous Australians might do in relation to celebration.



Back to school – understanding challenges faced by Indigenous children (The Conversation: 10 Feb 2017)

Although this article is four years old it contains some universal truths.

Many Indigenous kids will be excited about going back to school, while others will be feeling nervous as they come to grips with new teachers, peers, and environments. For Indigenous children, there are some added and unique challenges and opportunities. This requires Principals and teachers to work hand-in-glove with Indigenous families to ensure school is a culturally safe environment for their children, where Indigenous heritage is respected and promoted.



One way teachers can respect culture is by embedding it into 'mainstream' subjects. Tracey Nearmy/AAP

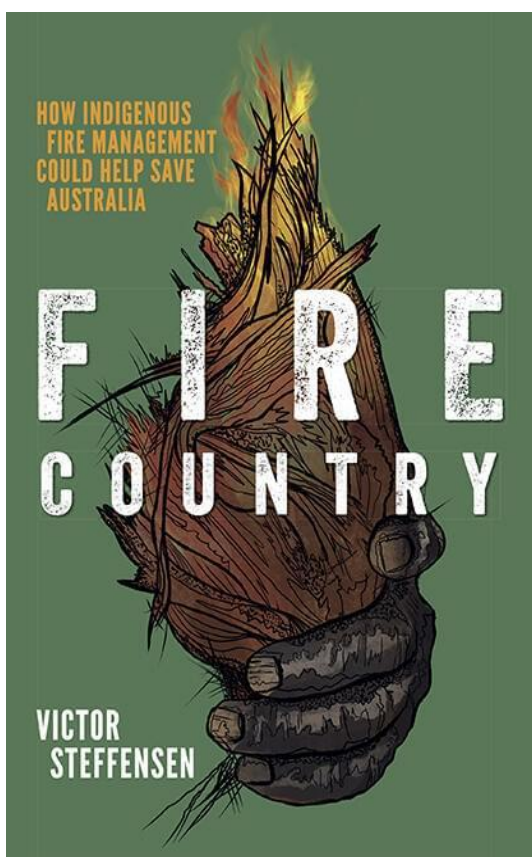
Seeking Indigenous community members to assist with your lesson / project etc

To be more effective with Indigenous students, classroom teachers are advised to seek out relationships with their local Indigenous community members. This will be invaluable come the time when you are expected to teach an Indigenous perspective in a lesson / unit and would like advice from the community. However, elders and community members may have many obligations on their time, and if they do agree to assist, please remember to make it a reciprocal arrangement. Honour the time that members give to you and your class by thanking them with at least a cup of tea and a biscuit. Minimum. There may even be a budget within the school to pay them for their expertise and knowledge. Otherwise, you may get this response (although note that this is aimed at more professional Indigenous informants being contacted cold through Twitter, the point is similar – please don't take Indigenous participation for granted):

How To Say: 'Sorry, I'm Not Doing That For Free'

- 1** 'Thank you for thinking of me, this sounds like a great fit, can I just check whether this is a **paid opportunity?**'
- 2** 'This sounds like such an interesting project! Here's a link to the **current services I offer**, I think xxx would be the best fit' or '...here's a copy of my media kit, which includes my rate card'
- 3** 'Thank you so much for considering me for this. Unfortunately I'm unable to take on any **unpaid projects** at the moment, but if that changes in the future I'd love to get back in touch'
- 4** 'Thanks so much for your enquiry! Out of **respect for my paying clients** I'm unable to give detailed advice via DMs, but here's where you can book a consultation, and I have a wealth of free resources at xxx'

Fire Country: How Indigenous Fire Management Could Help Save Australia



Indigenous land management expert Victor Steffensen's new book 'Fire Country' published by Hardie Grant is now available. 'Fire Country' is about Indigenous land management practices and a powerful account of First Nation people's connection Country. There is a marked difference between Aboriginal fire management and hazard reduction, as Victor explains how the two systems differ.

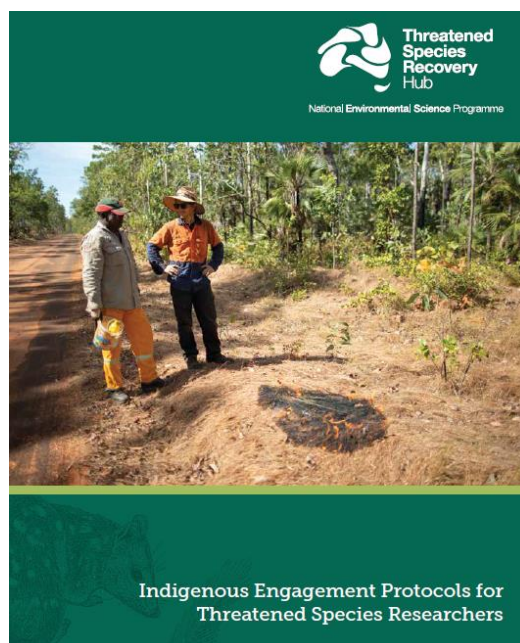
Delving deep into the Australian landscape and the environmental challenges we face, Fire Country is a powerful account on how the revival of cultural burning practices, and improved 'reading' of country, could help to restore the land.

From a young age, Victor has had a passion for traditional cultural and ecological knowledge. This was further developed after meeting two Elders, who were to become his mentors and teach him the importance of cultural burning. Developed over many generations, this knowledge shows clearly that Australia actually needs fire. Moreover, fire is an important part of a holistic approach to the environment, and when burning is done in a carefully considered manner, this ensure proper land care and healing.

Indigenous Engagement Protocols: Forging respectful, meaningful partnerships for research impact (*Threatened Species Recovery Hub, 21 Oct 20*)

Bradley Moggridge, the Threatened Species Recovery Hub's Indigenous Liaison Officer (and ISN member), brought his authoritative voice to the creation of a set of protocols for hub researchers seeking to collaborate with Indigenous partners.

Drawing on his experience as a research scientist and natural resource practitioner, he has written a practical guide which is designed to complement the hub's Indigenous Engagement and Participation Strategy (2016). [He tells us more about this exciting and important new publication](#) (document download linked to image on right).



PF-FIRE: Past Fire Frequency and Intensity Reconstruction

PF-FIRE is composed of a team of international scientists seeking to understand how fire has changes in frequency and intensity in space and in time. We specialise in time, using the fossil and sub-fossil record to reconstruct changes in fire and fuels (vegetation) across the Earth.



PF-FIRE *Past Fire Frequency and Intensity REconstruction*

Around 250 years ago, the British invaded the lands of Australia's First Peoples. This marked the beginning of a continuing attempt to remove Aboriginal and Torres Strait Islanders from their Country and impose European-style land management regimes. This attempt has largely failed. The climate and geology is largely inhospitable to imported crops and livestock. The dependence on fertilisers and irrigation have exacted a significant toll on the Australian environment.

The European attitude toward fire (characterised by fear) and "nature" have also had a major impact on the Australian environment. The attempt to remove Aboriginal and Torres Strait Islanders from Country and deny their skill and agency in shaping and managing Country with fire has caused widespread changes in vegetation across the continent.

ISN First Nations Co-Editor Michael Fletcher is one of the lead researchers for this initiative.

PAPERS

HandayaniInsih R., Wilujeng I., Prasetyo, Z. (2018)

[Elaborating Indigenous Science in the Science Curriculum](#)

International Journal of Learner Diversity and Identities 25(2):21-34 (January 2018)

Local wisdom is marginalized since it is not considered to be in accordance with the demands of Western science. It may be seen to be at odds and limits of scientific knowledge. This becomes the main problem for indigenous students, who feel alienated from their environment. They confront the challenge of existing in two worlds, the indigenous and the non-indigenous one. This paper combines the theoretical viewpoints of science education and indigenous science to provide a new perspective on science learning. Data were gathered through original document analysis of Java communities, natural science syllabi, and lesson plans. The results of the study indicated that indigenous knowledge in the Javanese community fulfilled competence in science learning that includes attitudinal aspects, knowledge aspects, and skill aspects.

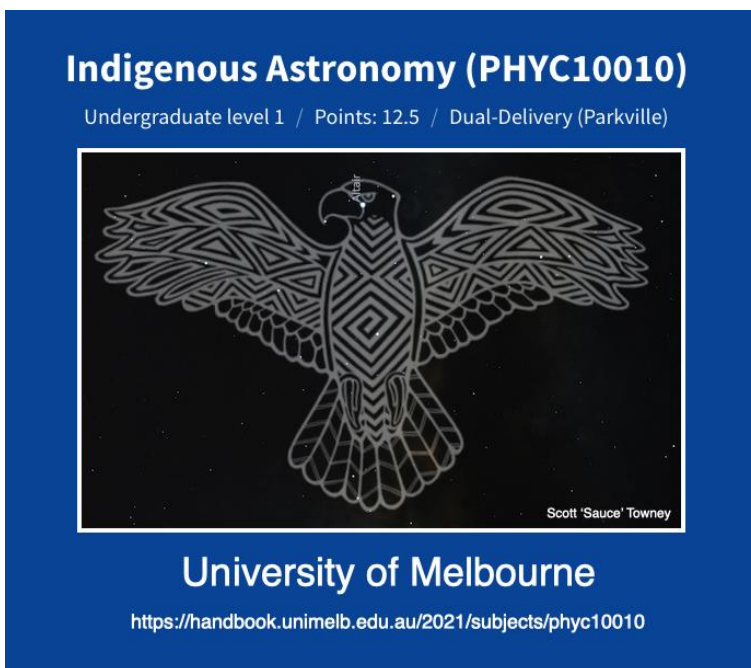
INDIGENOUS ASTRONOMY

This section of the bulletin is curated by Dr Duane Hamacher, Associate Professor of Cultural Astronomy, Centre for All-Sky Astrophysics in 3-Dimensions, School of Physics, University of Melbourne, Australia. Duane has a long history of involvement in this area and his regular contributions to this Bulletin are much appreciated.



New University Subject on Indigenous Astronomy

We are excited to announce that the University of Melbourne is offering a new subject, **PHYC10010: Indigenous Astronomy**, through the School of Physics that will be taught during Semester 1, 2021. This is a 1st Year Breadth subject (GenEd) and will feature a range of Indigenous and First Nations guest lecturers, further taught and coordinated by cultural astronomer, A/Prof Duane Hamacher.

A blue poster for the subject 'Indigenous Astronomy (PHYC10010)'. It features a stylized white bird with spread wings on a black background. Text on the poster includes: 'Indigenous Astronomy (PHYC10010)', 'Undergraduate level 1 / Points: 12.5 / Dual-Delivery (Parkville)', 'University of Melbourne', and the URL 'https://handbook.unimelb.edu.au/2021/subjects/phyc10010'. The artist's name 'Scott 'Sauce' Towney' is visible in the bottom right of the bird illustration.

Central questions will be: How are cultural understandings of science applied and developed by First Peoples? What do observations of astronomical phenomena such as variable stars, eclipses, planetary motions, and meteorite impacts tell us about the pre-Western origins of scientific observations and practice? What are some of the ways complex systems of knowledge are passed to successive generations? How can we apply emerging methodologies in cultural astronomy to reconstruct Indigenous Astronomical Knowledge that was fragmented due to colonisation in a collaborative and ethical manner? How can truth-telling about Indigenous people and their Knowledge Systems change negative perceptions in

modern society? What are ways that Indigenous Astronomical Knowledge be protected as living heritage?

Enrolments are now open.

<https://handbook.unimelb.edu.au/2021/subjects/phyc10010>

COSMOS Series on Indigenous Astronomy

COMOS Magazine is publishing an ongoing series of articles on Indigenous Astronomy in every issue. The last two issues include a general introduction to the field with Wirangu astrophysicist Peter Reeve and cultural astronomer Duane Hamacher, and the last issue featured an article about animal connections to the stars by Yorta Yorta ecologist Jessie Ferrari and Hamacher. Upcoming issues will feature articles co-authored by Gamilaray astrophysicist Karlie Noon, Wiradjuri astrophysicist Kirsten Banks, Gamilaraay/Yuwaalaraay astrophysicist Peter Swanton, Palawa artist Tina Leaman, and more!



Recent Publications

Check out some of the 2020 research outputs in Indigenous Astronomy:

- Lee, A.S.; et al. (2020) **Best Practices and Protocols for Including Indigenous Astronomy in the Planetarium Setting**. Proceedings of the 25th International Planetarium Society Conference. Under Review. (Preprint: arXiv:2008.05266)
- Kemp, C. et al. (2020) **Perceptual grouping explains constellations across cultures**. Under Review. (Preprint: arXiv:2010.06108)
- Hamacher, D.W. et al. (2021) **Whitening the Sky: light pollution as a form of cultural genocide**. *Journal of Dark Sky Studies*, Vol. 1, in press.
- Gullberg, S.R. et al. (2020). **A Cultural Comparison of Dark Constellations of the Milky Way**. *Journal of Astronomical History and Heritage*, Vol. 23(2), pp. 390-404.
- Hamacher, D.W. (2020) **Native American Traditions of Meteor Crater, Arizona: Fact, Fiction, or Appropriation?** *Journal of Astronomical History and Heritage*, Vol. 23(2), pp. 375-389.
- Hamacher, D.W. et al. (2020) **Solstice and solar position observations in Australian Aboriginal and Torres Strait Islander traditions**. *Journal of Astronomical History and Heritage*, Vol. 23(1), pp. 89-99.

Website

To learn more and attend upcoming events, please follow us on social media and visit our website

- www.aboriginalastronomy.com.au
- www.facebook.com/AboriginalAstronomy
- twitter.com/aboriginalastro

CONFERENCES / SEMINARS

ASERA Conference 2021



The Australasian Science Education Research Association

Promoting science education research in all contexts and at all levels of education

ASERA 52, the next Australasian Science Education Research Association Conference, will be held in Adelaide from 30 June - 2 July. There is the option of participating face-to-face or online. The call for papers is open. Details of how to send your abstract are available at:

<https://asera.org.au/conferences/2021-conference/call-papers-asera-52>

SEED Online Conferences (Science Educators for Equity, Diversity and Social Justice)

January 2021:

Reflecting in a Time of Crisis: Envisioning New Paths for Socially Just Science Education

October 2021:

TBA

SEED's Vision:

We find ourselves in a historical moment where science, technology, engineering and mathematics are unquestioned as important and necessary for participating in an increasingly technological and diverse society. In contrast, researchers with a long commitment to addressing equity and social justice issues, many of whom are scholars of color, have moved beyond mainstream ways of superficially addressing "STEM" education and instead seek to tackle issues directly and with transformative action. To this end, Science Educators for Equity, Diversity and Social Justice (SEEDS) is an organization committed to researching, building, and sustaining transformative science education with all students through critical engagement.

<https://sites.google.com/view/seedshome/conferences/january-2021-conference>

<https://sites.google.com/view/seedshome/conferences/october-2021-conference>

WORLD INDIGENOUS PEOPLES' CONFERENCE ON EDUCATION ADELAIDE SOUTH AUSTRALIA, 1 – 5 NOV 2021

Postponed from 2020, WIPCE 2021 will feature an exciting Indigenous education program of keynote presentations, networking, interactive workshops and discussion forums with an associated rich and diverse cultural program. An estimated 370 million Indigenous peoples live in all continents of the earth and represent a significant part of the world's vast cultural and linguistic diversity and heritage.

Indigenous peoples possess unique knowledge systems, which are recognised as crucial for sustainable development. At the same time, social, economic and political marginalisation of Indigenous peoples is pervasive in all the regions across the world.

Indigenous peoples face fundamental challenges when attempting to reconcile their own forms of culturally transmitted learning with systems of formal education. Over the past 30 years, WIPCE has endeavoured to address this issue and has grown to become a major international event in the Indigenous education movement. The WIPCE conference draws Indigenous representatives from across the globe to share successes and strategies for culturally grounded education. The needs of young Indigenous educators and leaders will be a key feature of WIPCE 2021 youth forums. WIPCE attracts Indigenous education experts, practitioners, scholars, students and communities, with up to 5,000 delegates expected in 2021 – the largest and most diverse Indigenous education forum on earth.



WIPCE 2021
Panpapanpalya

*Indigenous Education
Sovereignty:
Our Voices ...
Our Futures*

The Bulletin of the Indigenous Science Network is distributed four times a year via email directly to members. Membership is open to all. If interested in being a part of the Network, please contact the Coordinator via email at IndigenousSciNet@yahoo.com. Issues distributed in February, May, August and November each year.