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NZ IceFest
Bringing Antarctica
to the World



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aims and objectives of the Society or who
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They are elected by vote at the Annual
General Meeting and are restricted to 15 life
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Current Life Members by the year elected:

1. Bernard Stonehouse (UK), 1966
2. John Claydon (Canterbury), 1980
3. Jim Lowery (Wellington), 1982
4. Robin Ormerod (Wellington), 1996
5. Baden Norris (Canterbury), 2003
6. Bill Cranfield (Canterbury), 2003
7. Randal Heke (Wellington), 2003
8. Bill Hopper (Wellington), 2004
9. Malcolm Laird (Canterbury), 2006
10. Arnold Heine (Wellington), 2006
11. Margaret Bradshaw (Canterbury), 2006
12. Ray Dibble (Wellington), 2008
13. Norman Hardie (Canterbury), 2008
14. Vacant
15. Vacant



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New Zealand IceFest

by Chloë Dear, NZ IceFest Director

NZ IceFest's vision is to highlight New Zealand's leadership in Antarctica and the Southern Ocean. This unique Christchurch festival focuses the world's attention on the importance of this mysterious continent and its surrounds. Through creative and interactive experiences the Festival brings Antarctica to the general public, the Antarctic community and international visitors.

NZ IceFest was established in 2012 and delivered a strong programme of Antarctic-themed activities. It is fast becoming an internationally recognised festival, unique in its subject matter and multi-disciplinary programming.

The Festival is produced by the Christchurch City Council in collaboration with a diverse range of partners including

Crown Research Institutes, university departments, arts and heritage organisations, Antarctic programmes, museums and others. Many of these partners are now committed to a long-term working relationship with plans already in the pipeline for 2016 and beyond. We are excited about strengthening these relationships and working together to create an engaging festival experience.



Image courtesy of Chloë Dear

Check out more information in this edition of the Antarctic Magazine to get a taste of NZ IceFest. 2014 promises to deliver a dynamic event programme as this iconic festival brings Antarctica to the World. 🇳🇿

The goals of NZ IceFest are to:

- Highlight and value the importance of Antarctica and the Southern Ocean to New Zealand and the World.
- Ensure an iconic, sustainable and international Festival.
- Increase awareness of New Zealand as the world's leading 'Gateway to Antarctica'.
- Establish NZ IceFest as the key outreach vehicle for our Antarctic partners and provide world-class public engagement experiences.
- Attract nationwide and international exposure and visitors to New Zealand to cement the country as a place to live, visit and do business.

Bringing Antarctica to the World

Welcome to the NZ IceFest edition of the Antarctic Magazine. NZ IceFest 2014 (27 September – 12 October) is coming soon and we would like to give you a sneak preview to the world's premier Antarctic Festival.

The success of the first festival was largely due to the plethora of amazing speakers, many of whom come from NZ's Antarctic community. This year the festival will again feature an exciting speaker series. With around 100 speakers lined up, there is something for all from ski adventures to the South Pole and stories of Shackleton's whisky, to the microbial life of the Dry Valleys and tales of artists on ice.

Headline Speakers: The name says it all – keep an eye on the website as we announce who will be in the limelight.

The Big Issue: Panels of experts tackling the controversial issues.

Celebrate: Stimulating panel conversations.

Café Scientific: Informal expert conversations with the audience encouraged to be part of the conversation.

Antarctic Yarns: Quirky and relaxed yarns providing insight into daily Antarctic life.

Talk to Scott Base: One for the whole family, with a live video link to talk to the crew at Scott Base.

For out-of-towners, you will be glad to see we have themed the weekends to enable those who have a specific interest to make the most of our programming. The focus of the first weekend (26-28 Sept), to coincide with the Antarctic Season Opening, will be very much International. The middle weekend (3-5 Oct) concentrates on Adventure and Heritage, while the final weekend (10-12 Oct) has our main Art and Culture content. As Science is the currency of Antarctica and intertwined into most of our programming it will feature throughout.

NZ IceFest is hosting two amazing headline exhibitions this year: Antarctic Time Travel and Ice Lab: New Architecture and Science. Both exhibitions feature in this magazine so check these articles for more information.

We are also presenting an Antarctic Film Festival with a variety of offerings, from classics such as *The Thing* (1982 version) to the multi-award winning

Antarctica: A Year on Ice. And we will be showing a re-run of *Happy Feet* on the big outdoor screen so bring the kids down!

The festival site itself will be well worth visiting. A bespoke hub is being created in Cathedral Square to bring vitality back to our ever changing central city. Passing through the entrance, the belly of the plane, you will step out into the Antarctic themed festival area. As well as hosting the Antarctic Time Travel exhibition, the Speaker Series and kids' holiday activities, the Hub will provide a place to meet for an evening drink, enjoy a bite and watch some live entertainment!

There are many other activities not featured in this magazine such as Antarctic Air Day out at the airport where you can climb aboard the planes that fly south, the inaugural Husky Cup, a day of sled dog racing in Hagley Park and the Breaking the Ice art-science symposium.

We promise a full and exciting two weeks of diverse attractions (we have only touched on the highlights here) and the full NZ IceFest 2014 programme will be available at the end of August.

Until then keep an eye on our website for new events as they are announced: www.nzicefest.co.nz 🇳🇿

Antarctic Time Travel

by Veronika Meduna

Many of us think of Antarctica as an immutable land of ice and penguins. But during NZ IceFest, visitors will be able to embark on a journey back in time to a continent cloaked in forests and teeming with life. As they track Antarctica's transformation through geological time, they witness its role in global climate and our future.

The Antarctic Time Travel exhibition is an expedition through Antarctica's deep geological past to its present, and several generations into the future. While the concept of time travel may be borrowed from science fiction, the time machine this exhibition employs to take visitors on a walk through Antarctica's ancient subtropical landscape is firmly based on science. It is the result of research carried out by scientists who explore Antarctica's rich archive of climate information from the past to learn what the future may hold.

The journey begins 50 million years ago, when Antarctica had already settled at the South Pole but was nevertheless warm and humid enough for rainforests and crocodiles to thrive. From there, the time-travelling itinerary features several stopovers at significant points in time, for example when the first glaciers began to spread across the land, pushing any surviving vegetation out to the coast, or when, finally, conditions became so cold that ice extended its grip beyond the land and out to sea.

"Antarctica, in its unique, remote and relatively untouched location, is one of the greatest physical archives of past climate we have," says NZ IceFest exhibition coordinator Bec McMaster. "When you look into Antarctica's geological past you see the vastly different climates it has been exposed to. We know that changes in Antarctica and the Southern Ocean can signal global change. We need to be listening to and planning for these changes to learn how we as a species can thrive in conditions we've never experienced before."

The guide throughout the Antarctic Time Travel journey is the ubiquitous molecule carbon dioxide. As the atmospheric concentration of this important greenhouse gas changes across the millennia, so does the temperature, and in turn, the land, the ocean and the icescape in and around Antarctica. And as visitors take in the ever changing Antarctic scenery, they can watch how today's palaeo-climate scientists decipher clues about environmental conditions in the past from fossils, sediment layers and the ice itself.

The many exhibits include a garden, especially planted for NZ IceFest to represent Antarctica's primordial forests, and Antarctic rocks with exquisitely preserved imprints of leaf fragments from trees that once grew on the continent 40 million years ago. The interchanging layers of mud and boulders in a sediment core extracted from deep below the seabed of the

Southern Ocean represent a condensed history of Antarctica's changing icescape. Ice-coring equipment reveals how glaciologists sample tiny pockets of air in the ice to study ancient atmospheres and the close relationship between temperature and carbon dioxide concentrations.

"By examining geological records from Earth's past we can learn how our environmental system works under conditions that are similar to those projected for the future," says GNS Science palaeo-climate scientist Richard Levy, who is the creative mind behind the idea for the Antarctic Time Travel exhibition and part of a team of science advisors.

"We can obtain a detailed understanding of our climate system from historical data, but we need to look back in time beyond our instrumental records to gain insight into climate change and the ice sheets' response when Earth's atmospheric greenhouse gas concentrations were higher than today.

"Without records from our planet's past we would have no observation-based evidence that climate had ever been any different from today. Our perspective on the scale and timing of potential environmental change would be limited to what we know from the past several thousand years." Further along the Antarctic Time Travel journey of changing climate conditions in Antarctica, visitors get to drop in on a period about three million years ago, known to geologists as the Pliocene, when carbon dioxide concentrations were similar to those we are experiencing today. For Tim Naish, the director of the Antarctic Research Centre at Victoria University, this time in Antarctica's history is an important guidebook for our future. "The climate change we will face in the future and its impact on Antarctica, particularly on the ice sheets, has happened in the past. Understanding the consequences of these past natural experiments is critical for preparing for the impacts of future climate change and sea-level rise."

"The last time our planet experienced carbon dioxide concentrations of 400 parts per million in the atmosphere – today's levels from anthropogenic emissions – global sea level was more than 15 meters higher with at least half of that sea-level rise coming from the melting of Antarctica's margins."

By the end of the time travelling exploration of Antarctica's past, exhibition visitors find themselves back in the present, looking towards a climate future that no longer follows natural cycles but will be shaped by our own decisions.

Image courtesy of Nita Smith

Mapped against the 800,000-year climate record from Antarctic ice cores is our own, geologically very short, evolutionary history. The signature of our impact is clear, from the subtle changes in greenhouse gas concentrations at the time we developed agriculture to the parallel lines of rising carbon dioxide concentrations and global temperatures since the industrial revolution from 1760 onwards.

Antarctic biologist Victoria Metcalf, who is one of the Antarctic Time Travel science advisors, hopes the exhibition will provide clear insights and understanding of how natural climate variations differ from man-made effects. “This is a great challenge,” she says. “Climate change is such a polarised subject across public space and people tend to have very entrenched views. Sadly, misunderstanding even at high political levels contributes to misinformation out there.”

“So with literally the potential fate of the world on our hands, this challenge of communicating climate change is the greatest one yet. More than anything I hope that people walk away feeling empowered that the things they can do and change are more than a token effort. The public can make a difference and this exhibition should be an opportunity for people to examine their values and see which solutions fit these.” GNS Science climate scientist Heidi Roop, whose research is focusing on New Zealand’s climate history, says that climate change doesn’t need to be a gloomy subject. “As an early-career scientist, I hope that through a creative exhibit such as Antarctic Time Travel, we are able to highlight climate science in a fun and approachable way. For instance, there is space within science not only for labs and research institutes but also intersections with art, technology, politics and more.”

“Being informed in science doesn’t require you to be exclusively a scientist. I think that is a vital message as we head into a future where being informed in science is increasingly necessary for effective and appropriate decision-making at the local, national and international levels.”

Tim Naish hopes that the Antarctic Time Travel exhibition will illustrate that we are in charge of our own future. “We are part of an incredibly dynamic planet whose climate has evolved dramatically over millions of years due to changes in greenhouse gases in the atmosphere. Now our species is in the driver’s seat.”

“We have already changed our course so that it’s unlikely we will see the next natural ice age but are instead heading on a trajectory back to the future, where the world was two to six degrees warmer and sea levels tens of meters higher. But I hope the exhibition shows us that it’s not too late. Each of us has the power to slow the climate train down through the decisions we make”.

Bec McMaster hopes the exhibition makes climate and Antarctic science accessible to a mainstream audience, and ultimately get people talking about climate change in their families, work places and communities. “If every visitor left the exhibition knowing they are empowered to make a difference to the severity of climate change that we and our future generations face, I’d feel pretty damn proud of that.” “The scientists I’ve spoken with categorically believe (and know!) that we as individuals can and should make a difference to help reverse the place we’re currently in. Their caution is that we have to act today, because the longer we leave it the more dramatic the approach will have to be. I can’t wait to share the exhibition experience with them in September.” 📌

Antarctic Film Festival

Film Festival returns to NZ IceFest with the best about Antarctica.

NZ IceFest film festival will exhibit four remarkable films representatives of exclusive experiences of Antarctica. Each one is unique and expresses the feelings, experiences and emotions of those who explored the frozen continent.

Antarctica: A Year on Ice (2013)

Join Frozen Planet photographer Anthony Powell in this visually stunning portrayal that highlights the extreme conditions and enduring months of darkness in the harshest place on earth. This documentary has been 10 years in the making and documents what it is like to live in Antarctica for one full year; it even includes a wedding on ice. It has a wardrobe full of film festival awards including Best International Documentary and People’s Choice Award at the Calgary International Film Festival.

Art From the Arctic (2007)

Between 2003 and 2005 filmmaker David Hinton travelled 2,500 nautical miles on three expeditions aboard the schooner Nooderlicht filming artists, scientists and educators exploring the pristine environment of the High Arctic as part of the Cape Farewell project.

Witness the artists’ response to the harsh environment, and their take on the impacts of climate change. Some were inspired to make instant artworks, carving optical ice lenses and cameras, making glacial projections, creating habitable snow-rooms, sketching, drawing and writing, whilst others quietly absorbed their surroundings, producing work on their return home. Enduring temperatures of -35°C, the stormy waters of ‘The Devil’s Dancefloor’ and the cramped conditions of nautical living, we can join them in their exploration of the extraordinary and vulnerable Arctic.

Chasing Ice (2012)

This documentary includes a series of visually stunning time-lapses, by National Geographic photographer James Balog, designed for one purpose: to capture a multi-year record of the world’s changing glaciers. Chasing Ice is the story of one man’s mission to change the tide of history by gathering undeniable evidence of our changing planet. This film was in the New Zealand Film Festival in July 2012 and had great reviews; it’s not one to miss!

Erebus Operation Overdue (2013)

On 28 November 1979, an Air New Zealand jet with 257 passengers went missing during a sightseeing tour over Antarctica. How could a jet fly into a mountain in broad daylight? This film tells the story of the investigation involving New Zealand police officers who went to Antarctica as part of the police operation to recover the victims of the crash. Set in the beautiful yet hostile environment of Antarctica, this is the emotional and compelling true kiwi story of an extraordinary police operation.

These are remarkable Antarctic histories – not just about expeditions, ice or wildlife but also a motive to reflect, create and share. Prepare your mind and make this your next adventure. 📌

What Lies Beneath

by Veronika Meduna

Gabby O'Connor has a long-distance relationship with Antarctica. Her large-scale installations of icescapes suggest a degree of intimacy with the frozen continent, but she is yet to experience the Ice firsthand.



The Wellington-based sculptural artist is well known for her site-specific creations of icebergs, avalanches and ice walls that can transform a gallery room into a polar world. But rather than drawing inspiration from direct experience, her imagination is fuelled by the harrowing stories of Antarctica's early exploration and a deep appreciation of the science of ice formation.

Her latest work, *Heavy Water*, was inspired by a short time-lapse video sequence of a brine tube extending downwards from the underside of sea ice. Each autumn, a skirt of sea ice grows around the Antarctic continent, doubling its size in one of the world's most spectacular seasonal changes. As the surface of the ocean freezes, salt is squeezed into the layers of seawater just below. This brine, which is heavier than normal seawater, then begins to sink to the seafloor in plumes. As it descends, the boundary between the brine and seawater freezes instantly and forms a sheath of ice, known as a brinicle, that connects the frozen surface with the ocean floor. As it touches down, it kills everything in its way.

In *Heavy Water*, Gabby uses her signature materials – dyed and lacquered tissue paper, staples, light and space – to represent an undersea landscape of these icy fingers of death. It turns the gallery space into the narrow gap between the underside of an ice floe and the ocean floor. Each brinicle consists of a rope light sheathed in segments of translucent blue paper, built from thousands of triangles, each of which was dyed, cut and stapled together by hand.

Gabby's fascination with ice began some years ago, at a distance. She was flying from Tokyo to New York, passing over the Arctic during a moonlit night. That view was all it took to spark an ongoing interest. What led her to the other end of the world was her academic work for her Masters thesis in fine arts, exploring the idea of a horizon as an unachievable destination. In this context, she began to read the diaries and accounts written during the Heroic Era of Antarctic exploration, and

she began creating artworks from blue-tinted tissue paper, such as her earlier installation *Snow Cave*, reflecting on the theme of survival in uncharted territory.

Since then she has continued to use tissue paper and the time-consuming technique of building up large structures from small elements to create a massive iceberg for *What Lies Beneath* and an ice wall for the *Cleave* project last year.

Gabby says tissue paper is a perfect material. It is fragile and translucent, but at the same time strong enough to stand up in a large sculpture – and much like ice, it defies its original perception.

In the words of Abby Cunnane, a curator at the Hirschfeld Gallery, where *What Lies Beneath* was first shown in 2011, Gabby's materials reflect the ephemeral nature of her subject matter. "At a time when we are becoming increasingly aware of global warming, and what it means for humans, the melting of ice occupies a sensitive place in popular consciousness."

Clearly, Gabby has a high tolerance for repetitive chores. Her works, including those that are not based on icescapes, are all built up from hundreds, sometimes thousands, of small components, bound together to create shape and pattern. The installation can take days to complete. It can be back-breaking work. But Gabby says it allows her to engage directly and to invest energy into the work in a kind of meditation on complexity and interconnectedness.

This approach to her work has also made it possible to get others involved in the process. She has teamed up with scientists such as Craig Stevens, an oceanographer at the National Institute of Water and Atmosphere, and has run community and school workshops to discuss her art and the science of icebergs. She says she is looking forward to working with the Christchurch community to create an installation for NZ IceFest and to be part of the art-science education project *Cool Collaborations*. It will be a chance to show her Antarctic work just as scientists are getting ready for the next Antarctic research season and, one day, she may finally join them on their journey south. ❄️



Inspiring Students to Explore Antarctica

by Veronika Meduna

From colouring-in events for preschoolers to school competitions across a range of curriculum-based activities, education is an essential part of NZ IceFest.

Antarctica holds a firm place in people's imagination and has inspired creative and scientific pursuits even before the continent was discovered. For NZ IceFest education coordinator Nita Smith, it is a perfect place to set off a creative spark in young people. "I am interested in inspiring students to be curious about the world around them, so they can go on to make intelligent decisions. Antarctica with all its allure is such a great way to inspire an interest in not only science, but history, art, adventure and even international relations.

"What happens in Antarctica affects everyone in the world, but here in New Zealand, we're on Antarctica's doorstep. It's vital that young New Zealanders understand the environmental, economic and social issues that surround the region."

Leading up to the festival, schools have been invited to take part in a suite of creative educational events. The NZ IceFest Schools and Libraries Education Programme is designed for curriculum levels 3-5 and incorporates science, arts, technology, and the social sciences.

Ideally, the projects are carried out during the second or third term so that the winning entries can be introduced during the festival, which is held during the October school holidays. The programme offers three curriculum-linked projects, each of which leads into a competition with prizes such as Go Pro Hero Cams for the classroom.

The HIT Lab Gizmo Stations competition challenges students to investigate sustainable buildings and the idea of living and working in extreme conditions and to design a research station for Antarctica. This project links to Ice Lab, one of the headline exhibitions during NZ IceFest, which profiles five innovative designs of Antarctic research bases.



The requirement for the school competition is that the station is big enough to sleep 100 people, and includes sleeping quarters, science labs, a kitchen and living area, recreational spaces, mechanical workshops, equipment stores, facilities to generate power and freshwater and a sewage plant. Students are asked to consider issues such as the station's environmental impact, efficiency, comfort and practicality.

The Letter to the Future competition is an invitation to explore climate change in Antarctica and to see how it will affect the rest of the world. Students are asked to write a letter to somebody who lives in 2114, explaining what the world looks like now and how we go about producing the energy and food we need, and how we are adapting to changes in the climate.

"For NZ IceFest 2014, we have a strong theme around climate change," says Nita. The Antarctic Time Travel exhibition will be open for school groups a month before the festival kicks off and Nita says she looks forward to seeing how the students who visit the exhibition engage with the climate change content, and how the final exhibition space fills up with people's pledges on what they can do for climate change.

The third project is a video competition in which students are asked

to research and re-enact either one of the historic or contemporary expeditions to Antarctica or to produce a detective video investigating the carbon footprint of everyday items.

Apart from the School and Libraries Education Programme, NZ IceFest will also run the High School Antarctic Quiz, which was a favourite during the inaugural festival in 2012, and the Spirit of Enderby Science Communication Film Challenge, which is open to anyone between the ages of 18 and 30. The reward for the winning entry is a trip to the subantarctic islands with Heritage Expeditions as the Spirit of Enderby Youth Scholar.

Nita's own career has been inspired and motivated by Antarctica. A glaciologist by training, she has spent months on ice working with a number of research projects. She was one of the powerhouses behind the first IceFest event in 2012, and this year, as the coordinator for educational events, she is looking forward to being on the judging panel of all the education competitions. "I'm looking forward to seeing all the entries from a number of different education projects, to see the creativity that New Zealand's students hold." ❄️



ICE LAB – Halley VI. Image courtesy of A. Dubber

Contemporary Ice Stations

by Veronika Meduna

Ice Lab: New Architecture and Science in Antarctica celebrates innovative ideas that can spark off when science, art, architecture and engineering collide under extreme conditions. It is the first exhibition of its kind, and it will have its international debut at NZ IceFest.

Ice Lab was commissioned by the British Council after its director of architecture, design and fashion, Vicky Richardson, visited the West London studio of the architect who designed Britain's newest research station Halley VI. "I was captivated by the designs," she says. "It seemed clear that the commissioning of Halley VI marked the beginning of a new approach to Antarctic architecture – a new genre of architecture and a new era of scientific research in Antarctica."

Curated by the Arts Catalyst, a London-based contemporary arts organisation that has pioneered collaborations between artists and scientists, Ice Lab takes visitors to the icy frontiers of innovation in both Antarctic research and design. It features four examples of recently built research stations – Halley VI (UK), Princess Elisabeth (Belgium), Bharati (India) and Jang Bogo (South Korea) – and one speculative and provocative project called Iceberg Living Station, which plays with the idea of building living quarters entirely from compacted snow. "The exhibition also highlights some of the science that takes place on the continent, which is, after all, the reason these stations were built in the first place," says Arts Catalyst curator Sandra Ross. "We hope to spark ideas and dialogue that will allow further understanding of Antarctica; and to recognise the critical work of the international community of scientists, architects and engineers working there."

Until recently, she says, the mainstay of Antarctic architecture was based purely on function. "Now, however, the region is a forum for design, technology and engineering innovation, with an emphasis on the lessening of environmental impact and improving living conditions, as well as visual integration into the landscape."

Antarctica, the continent of extreme environmental conditions, has embraced space-age extreme architecture.

"And so through sketches, models, photographs, films, ephemera, relics and artworks, the exhibition reveals the impetuses behind and outcomes of the interdisciplinary and international endeavours that continue to take place in the most inhospitable place on earth."

The **Halley VI** station, designed by the award-winning British architect Hugh Broughton, was built for the British Antarctic Survey (BAS) and opened in February 2013. It stands on skis, which makes it the first fully relocatable polar research station in the world. It is also one of only two Antarctic stations to be positioned on a floating ice shelf, in this case the Brunt Ice Shelf from where BAS scientists discovered the ozone hole almost three decades ago.

The new modular station is designed to be self-sufficient, able to withstand freezing winter temperatures of -55°C and to have minimal impact on the environment. It can be towed to a new spot, which may become an important feature given that the ice shelf it sits on moves at a rate of 700 metres per year and that the station's predecessors have been engulfed by ice. Halley III, for example, was several metres under the ice when it was abandoned in 1983.

"Life in the new station of Halley VI is luxurious compared to previous stations," says David Walton, emeritus professor of ecology and former BAS staff member. "Some buildings were buried slowly by snow so that the only access was via frozen ladders in deep shafts and everyone lived underground all year. Now for the summer, at least, there is a light and airy station and plenty to do."

The Belgian **Princess Elisabeth** base is Antarctica's first zero emission station, powered by wind and solar energy, and with a smart grid to maximise energy efficiency. Perched on a nunatak, 200 kilometres from the coast and at an altitude of 1400 metres,



ICE LAB – Architect Impression, Jang Bogo, Space Group

the aerodynamic stainless-steel structure can withstand strong Antarctic winds and is layered so that no interior heating is necessary. The station seamlessly integrates renewable energy, water treatment facilities and passive building technologies.

The comfort level is in stark contrast to the experience aboard the *Belgica*, a whaling ship that had been refitted for the 1897 Belgian expedition, whose crew were the first people to live through an Antarctic winter. Wintering over wasn't part of the expedition's original plan, but the ship was caught in the pack ice, and the men had no option but to wait for the ice to melt again in spring. They were ill-prepared for the long polar night. Short of food and clothing, many expedition members became incapacitated by scurvy or came close to losing their sanity during the gruelling months of darkness and freezing cold. Nevertheless, the men returned to Belgium as heroes and were celebrated for bringing back the first continuous record of weather data for a full Antarctic year.

The newly built **Bharati research station** is India's third Antarctic research station. Its striking modernist structure is made from 134 prefabricated shipping containers, which were also used to carry the rest of the building materials to the site. Wrapped in a special aluminium case, its extensive glazing offers panoramic views while withstanding powerful winds, -40°C temperatures, blizzards and enormous loads.

The **Jang Bogo research station**, named after an admiral who controlled the south-western coast of the Korean peninsula during the Shilla dynasty, was completed in February this year and is South Korea's first base on the Antarctic mainland. South Korea is becoming a significant player in Antarctic research and this station, designed by Space Group, is one of the largest year-round bases on the continent. The station's aerodynamic triple-arm design provides resistance to the elements and accommodates up to 60 personnel during the busy summer season. A Korean newspaper editorial published at the time of the station's completion celebrated the fact that South Korea has joined nine other countries that have two or more permanent stations in Antarctica. The country's other station, King Sejong Station on King George Island, focuses on oceanography and coastal ecosystem, while the Jang Bogo station will concentrate on glaciology, meteors, the ozone layer and engineering in the coldest places.

The **Iceberg Living Station**, designed by Danish architect David Garcia, is a speculative proposal for how one could build accommodation within the ice. Over the centuries igloos have demonstrated how effective compacted snow is as

an insulator, and this project aims to design a living station for up to 100 visitors with minimum environmental impact. The station would be carved out of a large iceberg, using caterpillar excavators traditionally used to move and clear snow. Using the landscape as building material negates any need to transport foreign materials to Antarctica, and as the station would eventually melt over a seven-to-10 year period, it also solves the issue of dismantling and removing the structure once it has fulfilled its usefulness.

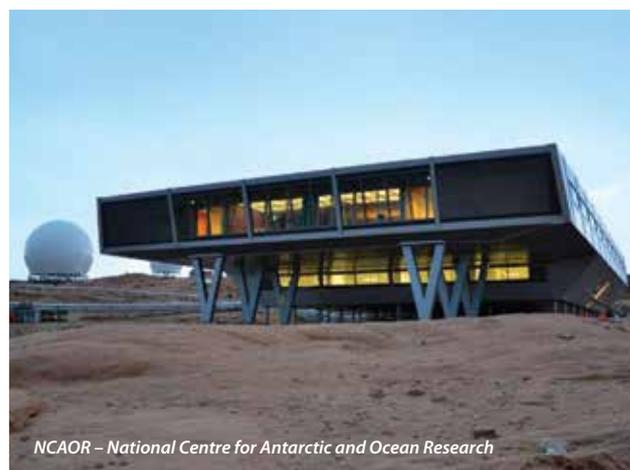
"Antarctica is an amazing place for architects to design for," says the British Council's Vicky Richardson. "It's one of the only really natural landscapes on earth. If you think of every other place on earth, the landscape has been made and remade by man, but Antarctica was only discovered relatively recently... and so for architects, it's this completely blank slate and there's no existing context to respond to."

Antarctica belongs to no one. It is the only continent without permanent human habitation, governed by the international Antarctic Treaty, which dedicates it solely to science. "It's really interesting in terms of its architecture and the way man views it as a place to inhabit, because it means that everything that happens there has to be about the research and also, the research has to be shared between nations."

Vicky Richardson says "Antarctica produces an imaginative, optimistic type of architecture." "There are also all these incredible constraints on building there in terms of the climate and the isolated nature of Antarctica, which are massive challenges, but I think architects often do their best work in relation to those kind of challenges."

The research stations that feature in the Ice Lab exhibition could not have been built anywhere other than Antarctica. The same applies to many of the research projects that are carried out from these bases.

"There are some areas of Antarctica that are seemingly out of this world," says David Walton in an essay that accompanies the exhibition. "In Victoria Land there is an area called the Dry Valleys, where all the lakes are frozen, it hardly ever snows and the humidity is among the lowest on earth. A strikingly beautiful but cold and forbidding desert, this remarkable landscape is the closest we have to an extraterrestrial site and so NASA has used it for training astronauts and testing modules designed for landing on the Moon and Mars." ¶



NCAOR – National Centre for Antarctic and Ocean Research

The Big Issue: The Future of the Antarctic Treaty

by Matt Vance

To look into humanity's past is to see a trail of war, exploitation and stupidity, punctuated by brief moments of peace and enlightenment. There are very few places in the world where there has never been war, where the environment is fully protected and where scientific research has priority.

The vast exception to this sorry tale is Antarctica. It has been a designated natural reserve and has been a continent devoted to peace and science for over 55 years. At the core of this unprecedented co-operation is the Antarctic Treaty.

It has not always been this way; for the most part, Antarctica has not played a direct part in geo-political history due to its isolation and severe environment. Antarctica remained undiscovered until the late 1800s. The rapidly improving technology and knowledge of the time accelerated and quickly broke down the barriers to access to the continent.

By the mid-1900s, permanent stations were being established on the continent and territorial positions were beginning to be asserted, creating a tension that threatened the future of scientific co-operation.

The International Geophysical Year (IGY) in 1957–58 was the catalyst that focused these tensions. The twelve nations active in Antarctica, nine of which made territorial claims or reserved the right to do so, agreed that their political and legal differences should not interfere with the IGY and that peaceful scientific cooperation in the Antarctic should continue indefinitely. The Antarctic Treaty was signed in Washington on 1 December 1959 and the document entered into force in 1961.

The Antarctic Treaty covers the area below 60 degrees South latitude (except for a provision relating to the high seas), now known as the Antarctic Treaty Area (ATA). Among other things, the Treaty prohibits nuclear explosions, radioactive waste disposal and military deployments in the ATA. The Treaty's other most significant goal is the encouragement of continued international co-operation in scientific research. All of this is extraordinary when you consider it was initially signed during the Cold War!

The Antarctic Treaty globalised and demilitarised the Antarctic continent and provided for its co-operative exploration and future use. The Treaty has been cited as an example of nations exercising foresight and working in concert to prevent conflict before it develops, and has served as a model for later 'non-armament' treaties.

Currently, 50 nations have signed the Antarctic Treaty but only 29 participate in the decision-making process.

These 29 include the original 12 signatories and other countries with substantial Antarctic research programmes. Only the Consultative Parties participate in the decision-making at the Antarctic Treaty Consultative Meetings (ATCM) and every decision requires a consensus. However, nations who conduct scientific research on the continent can request they be recognised as Consultative Parties.

The Antarctic Treaty has spawned additional international agreements on the conservation and management of the Antarctic environment. In recent times issues such as fisheries, tourism operations and mineral extraction have come under the media spotlight. These issues have placed the Antarctic Treaty and its future on the agenda of the global community.

The Manager of Health Safety and Environment at Antarctica New Zealand, Dr Neil Gilbert, will be one of the key speakers at NZ IceFest Big Issue series on the future of the Treaty. "The Antarctic Treaty System has stood the test of time," says Neil. "It has grown and adapted to meet a range of challenges and throughout its evolution it has remained true to the values of peaceful use, scientific cooperation and environmental protection. But Antarctica is under threat from a changing Antarctic climate and through increased human activity in the region. The regional challenges are significant and we are working hard to ensure the Treaty System shows its ability to adapt and respond effectively."

The NZ IceFest Big Issue on the Antarctic Treaty will examine the pressures on Antarctica and how these might impact on the environment and the political governance system. Can the Antarctic Treaty Parties rise to meet these new challenges? How will the Treaty System need to further evolve in this rapidly changing context? What actions need to be taken to build environmental and political resilience in Antarctica? What role must New Zealand play to ensure on-going peace and security to our far south? Most of all, what happens if humankind fails to continue in the spirit of the Antarctic Treaty?

The Big Issue.

Antarctic Treaty Politics: Behind the Scenes

Saturday 27 September, 7.30pm, Venue: Ross Island Tent, NZ IceFest Hub, Central City Christchurch.
www.nzicefest.co.nz 

Emperors wider. Image courtesy of Anthony Powell

First Crossings

by Matt Vance

The first unsupplied, unsupported New Zealand expedition to the South Pole.

Explorers are a dying breed, or so you might think. That is until you meet Kevin Biggar and Jamie Fitzgerald, two young New Zealanders who set themselves the challenge of trekking, unsupported, 2400kms from the Antarctic coast to the South Pole and back, across the coldest, windiest, highest and driest place on Earth.

What they did not know was that no one had done it before, for good reason!

There are easier ways to avoid marriage than trekking across the wastes of the polar icecap but that did not stop these two adventurers. Their warm up was to row 5000km across the Atlantic in the biennial Atlantic Rowing Race. They had not met prior to the race but knew each other well by the end of it. They won the race in record time and cemented an adventure partnership that has made them household names in New Zealand.

“The next adventure was always on our minds,” said Jamie. “New Zealand has always had a strong link to Antarctica. It captures the Kiwi imagination like nowhere else. The 50th anniversary of Sir Ed Hillary making the South Pole was looming and it made sense for us to be part of it.”

After consulting with Sir Ed on the potential for a South Pole expedition, they set about two years of physical training and courting sponsors. To simulate the sensation of man hauling sleds, they dragged car tyres around the suburbs of Auckland, much to the delight of the local youth who were known to yell: “Hey, loser, where’s the rest of your car?” Getting ice experience involved travelling up to Alaska for some training in how to use their gear and basic survival in polar conditions.

Once in Antarctica their first impression was of the vastness of the place. Kevin describes it: “The loneliest spot that I’ve been in is jostling madness compared with this. The landscape is completely and utterly indifferent. We are as insignificant and ephemeral as any two of the billion flecks of snow that are rushing past us on their way to oblivion.”

With a target of 12 miles per day over rough terrain, through crevasses and sastrugi, Kevin and Jamie were in a race against time. To add to the difficulty they were dragging sleds with supplies that weighed over 160kg each. Even this vast load was not enough to sustain the eight to ten thousand calories needed daily to maintain condition.

They found themselves losing weight at the rate of a staggering one pound per day. As well as this strange ‘auto-cannibalism’, Kevin and Jamie experienced abyss-like crevasses, tooth-cracking cold, fickle GPS, lost iPods, splitting fingertips, ripped hamstrings and skin-melting frostbite. Surprisingly, they were also attacked by white ninjas and ambushed by women in bikinis!

Kevin describes the worst of it: “The heartbreaking cold. It slowly consumes you and you watch yourself falling to bits as



Images courtesy of Kevin Biggar



the days pass. Each day there is less of you to keep up the fight. It’s like riding a slow path to death.”

The physical challenge was matched by the enormity of the mental challenge of such a vast trek. “Like most people our motivation was born out of a sense of progress. In order to visualize this we drew lines on the roof of our tent that marked our slow march across the continent. It made a big difference,” said Jamie.

A strong sense of history and of those who had come before them is apparent in these adventurers. This only grew stronger once they were out on the trail. “It is impossible to get your head around what the likes of Scott’s men felt when they were out there on the polar plateau. What they went through was beyond normal human experience. We at least had the peace of mind of technology that kept us connected to the world. They had only uncertainty and fear to look forward to.”

After being the first New Zealanders to reach the Pole unaided the duo have gone on to feature in the First Crossings television series and run their own motivational speaking and corporate training businesses.

Kevin and Jamie will feature as headline speakers at two sessions at NZ IceFest:

Saturday 4 October, 7.30pm, Venue: Transitional Cathedral
 Kids’ session: Sunday 5 October, 10.30am, Venue: Ross Island Tent, NZ IceFest Hub, Central City
 See www.nzicefest.co.nz for more details

Christchurch: The Hub of Antarctic Programme Management

by Matt Vance

Christchurch has long been considered a gateway to Antarctica. The national Antarctic programmes of New Zealand, the United States and Italy are run from Christchurch International Airport while the Port of Lyttelton is frequent host to the South Korean, Italian and United States ice breakers and other vessels which support science in McMurdo Sound and the Ross Sea region.

What is less well known is that Christchurch is the headquarters of the Council of Managers of National Antarctic Programs (COMNAP). COMNAP is an international organisation formed in 1988 to facilitate cooperation among the twenty-nine National Antarctic Programmes. The National Antarctic Programmes are government-funded entities, like Antarctica New Zealand, that support scientific research in the Antarctic Treaty area on behalf of their governments. Together they operate some 80 Antarctic research stations, coordinate aircraft and vessel operations and support a range of research on behalf of all nations involved in Antarctic science.

The Antarctic Treaty, signed by 50 nations, is the founding legal document that is part of a system which has designated Antarctica as a natural reserve devoted to peace and science. The Treaty was agreed to in 1959 and has at its core the concept of international cooperation and information exchange which has made the Antarctic Treaty a world-leading system for governance.

COMNAP's goal, which is firmly aligned with this essential core of the Antarctic Treaty, is to "develop and promote best practice in managing support of scientific research in Antarctica". To achieve this purpose COMNAP provides a forum to develop best practices, international partnerships, information exchange and also provides the Antarctic Treaty system with practical, technical and non-political advice on a range of topics from waste management and alternative energy solutions to international collaboration.

COMNAP's members are the National Antarctic Programmes of the current 29 Consultative Parties to the Antarctic Treaty. Some of these programmes have been working in Antarctica since the International Geophysical Year (IGY) of 1957/58 and have a great depth of experience and best practice to share with more recent participants into the system. Each is represented by the Manager and Deputy Manager of the National Antarctic Programme. These people have the greatest firsthand experience of operating and supporting scientific research in Antarctica and so their expertise is unrivalled.

COMNAP is run through its headquarters, called a Secretariat, legal-speak for an international association's offices. Michelle Rogan-Finnemore is the Executive Secretary, or the head of the COMNAP Secretariat, which is hosted at Gateway Antarctica at the University of Canterbury. "My role is to run the organisation side of COMNAP, assist the

managers to deliver their research programmes and add value to their work by assisting them to create strong international partnerships and strengthen their ability to share best practice." The COMNAP Secretariat has been hosted by the United States and by Australia in the past. It moved to New Zealand in 2009 and it is hoped it can stay here for the foreseeable future. Michelle adds, "Christchurch, with its many connections to the Antarctic, and the University of Canterbury with its exceptional infrastructure and support, and with its academic facilities including an incredible library facility which houses the Antarctic Collection, make an ideal home for COMNAP – one of only four Antarctic-related Secretariats in the world."

Antarctica New Zealand will host the annual COMNAP meetings this year, which means that the COMNAP symposiums, workshops and the Annual General Meeting will be held in Christchurch, 27–29 August. To celebrate and benefit from this significant international presence in Christchurch, NZ IceFest is launching its exhibitions and hosting a short programme of talks over that time period.

In addition to the COMNAP programme of events, the Scientific Committee for Antarctic Research (SCAR) will be holding its open science conference in Auckland, 25–28 August 2014. This conference, hosted by the Royal Society of New Zealand, will focus on "Global Messages from Antarctica".

SCAR is an inter-disciplinary committee of the International Council for Science and is charged with initiating, developing and coordinating high quality international scientific research in Antarctica and on the role of the Antarctic region in the Earth system. SCAR also provides objective and independent scientific advice to the Antarctic Treaty Consultative Meetings and other organizations on issues of science and conservation affecting the management of Antarctica and the Southern Ocean.

Both COMNAP and SCAR are attracting top calibre Antarctic science and operations talent to the following NZ IceFest events:

SMART TALK at the Auckland Museum:

A chance to sit back and listen to a panel of internationally renowned Antarctic scientists from the Scientific Committee for Antarctic Research (SCAR) talk about the international endeavour of Antarctic Science, and what the future holds for Antarctica. Thursday 28 August, Auckland Museum, 7pm.

Celebrate: Antarctica, An International Endeavour

A personal insight into life at the Antarctic stations of South Korea, Belgium, Britain and India (all featured in the Ice Lab exhibition). International speakers from COMNAP will talk about their time on the ice.

Saturday 30 August, 10.30am–12.00pm, Canterbury Museum. 



Image courtesy of Nita Smith

Following Antarctic Dreams

by Matt Vance

Antarctica is one of those places like the moon that can seem out of reach for the ordinary person. That is, until you discover the great opportunities available to those who are brave enough to make their Antarctic dream a reality.

Over the last ten years a variety of programmes that support passionate people achieving their dream of going to Antarctica has been developed. For the most part these are based on using the experience of Antarctica to nurture leadership, custodianship and awareness of the continent. Heritage Expeditions, Gateway Antarctica and the Sir Peter Blake Trust are all organisations that have recognised the value of first-hand experience in making these goals a reality.

When Antarctic dreams and opportunity meet, big things can happen. NZ IceFest's Celebrated speaker series will be giving you a look into the lives of three Antarcticans who seized the opportunity provided by these organisations to follow their dreams.

The Enderby Scholarship

The Enderby Trust was founded by the Russ Family who have been running expeditions to Antarctica and the Sub-Antarctic islands of New Zealand since 1986. Their ship, the *Spirit of Enderby*, has been a frequent visitor to these waters and has done more to expose the international world to the significance of these special landscapes than any other commercial organisation.

The expeditions have a significant educational element to them, with lectures and staff with expertise in wildlife, ecology and the fascinating history of these areas. Creating passionate advocates for Antarctica and the Sub-Antarctic islands of New Zealand is what they do best and it naturally leads to the question of what could be done to attract younger advocates.

The Enderby Trust was set up to attract 18–30 year olds to apply for inclusion in one of their expeditions south. Applicants are selected on their ability to communicate their passion for the South in essay form.

Victoria Metcalf was one of the first recipients of the Enderby Trust Scholarship. In the process of doing her PhD Victoria applied to the Trust after a colleague had sparked her interest in aspects of tooth fish related to her studies. With only three weeks to go before the departure of the Ross Sea voyage she found out she had been selected.

The experience of Antarctica was profound for Victoria. "I remember clearly sitting on top of Possession Island. It was the first time I had been ashore in Antarctica and I was surrounded by 1000s of Adélie penguins and looking out across the amazing Trans-Antarctic Mountains. It was there I had an epiphany. It came to me that Antarctic marine life was what I wanted to base my research interests on."

The voyage south allowed Victoria to learn through direct experience with the history, wildlife and landscape of Antarctica and this experience has remained with her throughout her subsequent career as a scientist.

"After my experience as an Enderby Trust scholar I went to the US to do an Antarctic post-doctoral research and got to spend seven weeks mid-winter fishing on the Antarctic Peninsula."

Victoria worked hard to obtain her own funding in Antarctic marine research and has since been to Antarctica seven times to pursue her research.

"I am very passionate about Antarctica and understanding it, valuing and protecting it. In particular, I have worked on understanding more about climate change effects, ocean acidification effects and pollution impacts on Antarctic fauna."

The Post-graduate Certificate in Antarctic Studies

The Post-graduate Certificate in Antarctic Studies (PCAS) is a fifteen-week, multi-disciplinary programme that critically examines contemporary scientific, environmental, social and political issues of Antarctica and the Southern Ocean.

PCAS was jointly developed by the University of Canterbury and Antarctica New Zealand and has a significant component of fieldwork. The experience of living and working in Antarctica helps cement the academic aspects of the course in context and this is the only course of study to visit Antarctica.



Image courtesy of Victoria Metcalf

Jana Newman, a PCAS student was studying at the University of Canterbury Geography Department and had a strong interest in the science of cold places, partly fuelled by her father's tales of working in Antarctica.

"It was great to be part of an interdisciplinary course. I went in with my focus on science and came out with a broader interest in environmental management, law and politics, subjects I had not considered much before. I think it set me up well for the work I do now, where I traverse both the science and policy worlds."

The PCAS course was a key ingredient in Jana's career path "After PCAS, I finished my Master's degree, researching a small Antarctic glacier that had been impacted by dust and emissions from human activity. I then worked as a volunteer for the Department of Conservation (DOC) on sub-tropical Raoul Island before getting a job with DOC working on Stewart Island and the New Zealand Sub-Antarctic Islands, monitoring the impact of human activities in those cold environments."

In 2006 Jana moved to Antarctica New Zealand to work in the environment team. Initially she worked on environmental monitoring in Antarctica before moving into linking Antarctic science and policy to support environmental protection. This work is an integral part of supporting a strong and effective Antarctic Treaty System.

Sir Peter Blake Trust Antarctic Youth Ambassador

The Antarctic Youth Ambassador programme was launched in 2007 as a collaboration between Sir Peter Blake Trust and Antarctica New Zealand. The initial impetus for the programme stemmed from Sir Peter Blake's strong interest in the environment and Antarctica. The Trust selects two young New Zealanders annually to participate in, and contribute to, the environmental, engineering and heritage restoration work at Scott Base. The Ambassadors are encouraged to educate others through their experiences with a strong emphasis on leadership.

Jay Piggott was the first Antarctic Youth Ambassador in 2007 and came to the award with an impressive background in science, mountaineering and outdoor leadership. Among other remarkable achievements Jay was the youngest person to summit Mount Aspiring at the tender age of 15. Jay's passion for the natural world ultimately led him to embark in an ecological science career.

Jay is an avid fan of Edwin Mickleburgh who once wrote, "The Antarctic continent has become a symbol of our time. The test of man's willingness to pull back from the destruction of the Antarctic wilderness is the test also of his willingness to avert destruction globally."

Jay adds, "One hundred years ago the Antarctic challenge was a race to reach the South Pole. The current challenge, I believe, is one of science and stewardship."

Sir Peter Blake's legacy reminds us that vision alone is not enough. Jay adds "Change comes through realising the vision and turning it into a reality. The AYA experience motivated me to rise to this challenge by dedicating my career to ecological science and environmental management."

While visiting Antarctica allowed Jay realise a life-long dream, his greatest enjoyment came through sharing his Antarctic experiences with young New Zealanders and instilling in them an appreciation of the Antarctic environment and a collective responsibility to protect and conserve it.



Image courtesy of Jana Newman



Image courtesy of Jay Piggott

Antarctica is the continent of the future. It has provided us with an example of how to manage a precious environment that excludes the usual foibles of war and exploitation. Antarctica is also where lessons from the earth's past and potential future are manifest simultaneously. In addition, the dual issues of the changing Antarctic climate and increased human activity in the region mean that it is essential to have informed and passionate people leading the way in debate around Antarctica and its place in the world.

Each of these programmes and scholarships is firmly focused on creating leaders with the awareness and education to keep Antarctic issues prominent and well-grounded. The New Zealand IceFest celebrated speaker series panel of Antarcticans will enable you to hear first-hand from Jana, Jay and Victoria how to turn your Antarctic dreams into reality and how these opportunities have allowed them to play a part of Antarctica's future.

NZ IceFest, Celebrate Series: Following Antarctic Dreams

Thursday 2nd, Oct, 5pm, Venue: Ross Island Tent, NZ IceFest Hub, Central City, Christchurch.

www.nzicefest.co.nz 



New Zealand Antarctic Society Membership

The New Zealand Antarctic Society Inc was formed in 1933. It comprises New Zealanders and overseas friends, many of whom have been to the Antarctic and all of whom are interested in some phase of Antarctic exploration, history, science, wildlife or adventure.

A membership to the New Zealand Antarctic Society entitles members to:

- *Antarctic*, the quarterly publication of the Society.

It is unique in Antarctic literature as it is the only periodical which provides regular and up to date news of the activities of all nations at work in the Antarctic, Southern Ocean and Subantarctic Islands. It has worldwide circulation.

- Attend meetings, educational and fun events which are held by the Auckland, Wellington and Canterbury Branches of the Society.

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BNZ, Christchurch Branch



The Antarctic | Births & Deaths (Part I)
by Laura Tomlin

Expecting. Open memory box, check.

Arrival. Assaulting beauty greets.

Inhale. Desiccation ambushes lungs.

Take a moment. Reconcile exhilaration, expectations.

*Embark. Losing my perspective in reduction synaesthesia,
marinating in the essence of the senses, in...*

Primordial light, sound...bullies me.

We evolved beyond this,

In simplicity we are thereby undone.

In death we match this expanse, this purity.

This place cannot be read...nor tell us about ourselves.