

VCCAFS

Vice-Chancellor's College Artist Fellows Scheme

2016

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Australian
National
University

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FOREWORD

I first had the honour of having my research artistically interpreted when University House commissioned Valerie Kirk, Higher Degree Research Convenor at the ANU School of Art & Design, to create a tapestry commemorating the supernovae research that led to the award of my Nobel Prize for Physics. Whilst I must admit to initial difficulty in expressing my research in a way that could be effectively translated into a woven expression, the resulting tapestry is stunning and gives me great pleasure every time I glance it as I enter The Hall at University House. Since then I have had several opportunities to help express my research through a number of mediums including painting, photography, digital and video.

Art gives us the ability to explore complex research discoveries in visually interesting and accessible ways. The Vice-Chancellor's College Visiting Artist Fellows Scheme ensures that a collaborative culture between artists and researchers is alive and well on campus. I hope you enjoy this collection from the 2016 Fellows and I congratulate everyone involved in the program.

Professor Brian Schmidt AC

Vice-Chancellor and President

The Australian National University

ANU VICE-CHANCELLOR'S COLLEGE ARTIST FELLOWS SCHEME (VCCAFS)

In 2012, a report on interdisciplinary research by the Australian Council of Learned Academies noted that “The real world does not always present its problems and opportunities conveniently aligned with traditional academic disciplines so mechanisms are needed to facilitate interactions and collaborations between researchers working in widely different fields.” The Vice-Chancellor’s College Visiting Artist Fellows Scheme (VCCAFS) is one such mechanism, established by The Australian National University (ANU) in the same year.

The first scheme of its kind in an Australian university, VCCAFS supports interdisciplinary research relationships across the seven colleges of the ANU, sustaining a wider mutual understanding of collaborative working practices. Staff, advanced students and recent alumni of the School of Art & Design have worked with academic partners to develop, pursue and report on research projects in such diverse fields as botany, geology, chemistry, computer science, anatomy, climate change and herpetology. Practice-led research, robust intellectual dialogue and innovative research methods are developed in the pursuit of creative solutions to real world challenges.

Each fellowship lasts one academic year, is supported by a personal award and material costs, and is completed by a group show with an exhibition catalogue. These prestigious fellowships offer an exciting opportunity for our top creative practitioners to work with high-flying researchers in other fields: an important stepping stone in the career development of young artists, many of whom have defined their practice in terms of interdisciplinary engagement. Artist fellows are selected each year on the basis of their work, research

interests, the strength of the project proposal and collaboration. Prospective artist fellows identify an appropriate research field and collaborator within one of the ANU Colleges. An interdisciplinary panel, comprising senior University staff and external advisors selects successful applicants.

The entire VCCAFS process—devising a project, identifying a collaborator, reviewing submissions, pursuing research in the field and in the studio, articulating findings in an exhibition—establishes a community of practitioners and researchers, students and scholars, specialists and an engaged audience around interdisciplinary research. We congratulate the 2016 Artist Fellows and warmly thank their academic collaborators.

Professor Denise Ferris

Head

School of Art & Design

College of Arts and Social Sciences, ANU

2016 COLLEGE COLLABORATIONS

DR TONY CURRAN

in collaboration with

Dr Ben Swift, Research Fellow,

Research School of Engineering,

ANU College of Engineering and Computer Science

MS NGAIO FITZPATRICK

in collaboration with

Professor Mark Howden,

ANU Climate Change Institute;

Vice Chair, Intergovernmental Panel on Climate Change Working Group II;

Honorary Professor, School of Land and Environment, The University of Melbourne;

Distinguished Adaptation Scholar, University of Arizona

DR CATHY FRANZI

in collaboration with

Professor Adrienne Nicotra,

Research School of Biology,

ANU College of Medicine, Biology and Environment

MS JEN FULLERTON

in collaboration with

Associate Professor Robert Ackland

School of Sociology and Centre for Social Research and Methods

ANU College of Arts and Social Sciences

DR ANNA MADELEINE

in collaboration with

Associate Professor Krisztina Valter

and Dr Alexandra L Webb

Medical School

ANU College of Medicine, Biology and Environment

MS JENNIFER ROBERTSON

in collaboration with

Emeritus Professor Ian Jackson,

Research School of Earth Sciences,

ANU College of Physical and Mathematical Sciences

TONY CURRAN

ANU COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

RESEARCH SCHOOL OF ENGINEERING

Artist Statement

Towards the end of 2015 I became aware of a paradox in my painting; the brushstrokes looked simultaneously hand-made and machine-generated. Having used iPads as sketching tools for several years, the mark of the computer rendered lines and shapes with hard edged digital precision. With a touch screen, a gestural and embodied abstraction was rendered in a mechanical aesthetic. The best description I could think of was a line from Walt Disney Picture's *TRON: Legacy* (2010) in which Kevin Flynn (Jeff Bridges) says of programming life in the digital space, "It's Bio-digital jazz, man."

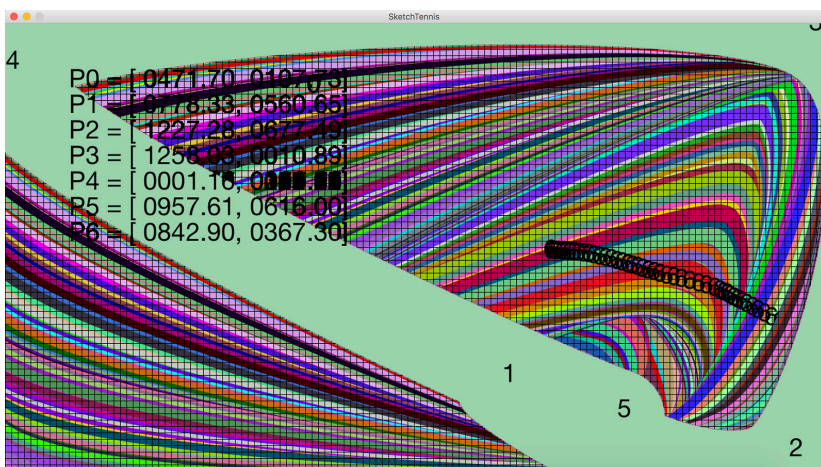
Dr Ben Swift of the ANU Research School of Engineering generously accepted my invitation to collaborate on a project to explore this union of the human and machine, testing the hypothesis that digital art with an equal balance of human gesture and mechanical structure has the potential to make digital art powerfully compelling.

The collaboration had three distinct phases. Informed by historical and theoretical texts on digital and computer art, the collaboration began with regular consultation between Dr Swift and myself towards a program I was making titled *The unconscious is a rectangle*. The function of the program was to use shapes from previous digital drawings that I had produced over the last five years. These shapes would be stored in a database and randomly collaged on top of other shapes to generate an infinite variety of compositions from the biomorphic shapes and wiggles.

In order to tweak the program, the collaboration moved onto a second phase in which I audited a programming course, 'Art and Interaction in New Media', convened by Dr Swift. This course introduced me to the programming language, Processing, which enabled me to build *The unconscious is a rectangle* and exhibit it at Canberra Contemporary Art Space and Wagga Wagga Art Gallery.

A firmer grounding in code, achieved through Processing produced a new phase in which Dr Swift and I coded together through back and forth emails generating new iterations of a program that generates random algorithmic wiggles. These periods of gradual development have so far resulted in a

program in which mathematic wiggles produced by vector curves behave as cartoon amoeba wiggling and shifting as if viewed under a microscope.



Tony Curran and Ben Swift, *Sketch Tennis*, 2016 (progress image). Processing sketch, variable dimensions. Image courtesy the artists.

Collaborator Statement – Dr Ben Swift, Research Fellow, Research School of Engineering, ANU College of Engineering and Computer Science

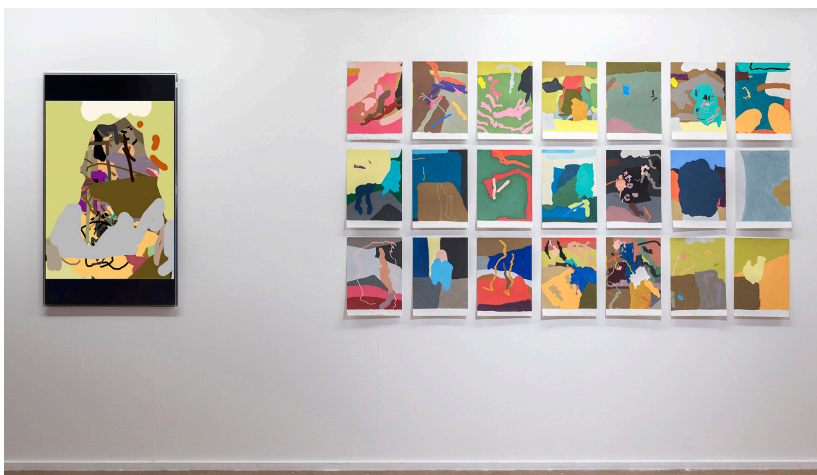
As Tony Curran and I began working together, we found a shared interest in exposing the process of our craft. I saw in his ongoing time-lapse drawing work some similarities to my own work in live coding – the process of writing software in front of an audience. As we discussed our reasons for exposing the construction of our work, rather than just showcasing the finished product, we discovered a shared interest in finding the outworking of human creativity

through this mechanical process, rather than hiding the mechanical processes from the viewer.

Over time, it became clear that Tony had greater ambitions in his digital work, but was limited by an unfamiliarity with the languages of programming. As someone who teaches programming to artists (and creative code to programmers) we decided that the most useful path for our collaboration was for me to assist Tony to develop his programming skills. This became the subject of our (almost) weekly meetings.

Throughout this process, I was still committed to my “capture & expose the process” aesthetic. In software development, version control tools such as Git exist for exactly this purpose; to track and manage the evolution of a software artefact as it is developed through time. For the final stage of our collaboration, Tony and I have been exploring his drawing-inspired squiggle programs through a collaborative back-and-forth coding process, and I have been using version control tools to track the progress of our collaborative efforts. This history will be preserved, and we are still exploring ways to expose this history to the viewer.

This collaboration has been extremely beneficial for me as a practitioner who tries to engage with digital and process art, but mostly from the Computer Science side. Through working with Tony I have been able to filter his aesthetic vision through my own computational and software development expertise which is intertwined with my interest in exposing the artistic process.



Tony Curran, *The unconscious is a rectangle*, 2016 (exhibition installation). Processing sketch, 1080 x 810 pixels. Photo courtesy Canberra Contemporary Art Space and Brenton McGeachie.

NGAIO FITZPATRICK

ANU COLLEGE OF PHYSICAL AND MATHEMATICAL SCIENCES

CLIMATE CHANGE INSTITUTE, RESEARCH SCHOOL OF CHEMISTRY

Artist Statement

The joint project set out to explore how art can communicate the urgency and complex issues surrounding climate change. In an early conversation, ANU Climate Change Institute (CCI) director Professor Mark Howden advised me of several key points to consider: the rapid rate of irreversible climate change, the diminishing opportunity for mitigation, and the fact that we must now adopt adaption strategies. We also discussed the importance of circumnavigating public fatigue with the issues and met regularly to explore the means to do this.

I discovered the CCI does not specialise in a particular field of research but instead encompasses many diverse areas focusing on opportunities and collaborative partnerships with a global reach. During the year, I attended talks and presentations on a wide range of topics and met collaborators in science, astrophotography, music and dance. I also attempted to stay abreast of daily articles, publications and CCI updates, at times feeling overwhelmed by the amount, complexity and extent of information and data.

After seeing a travel poster advertising, ironically, luxury escapes to Queensland's tropical islands in winter, I decided on a poster format for the project. I had recently read an article on climate tourism, a "see it before it disappears" phenomenon adding stress to already fragile environments. Posters have the capacity to engage through the use of simple and arresting imagery. They disrupt, incite action, include humour and have a history of being used for political purposes. The decision to print Photoshop images on glass was driven by its characteristics of being a fragile, seductive and dangerous material.

I found myself drawn to the contradiction between the devastating coral bleaching of the Great Barrier Reef and the approval of Australia's largest coal mine in the Galilee Basin. The cognitive dissonance associated with these two events is at the heart of the human relationship with climate change. We now live in a post-truth world where scientists must necessarily communicate facts with academic detachment. Artists can bear witness to critical contemporary issues using the many means at their disposal. The VCCAFS program has been a rich and rewarding experience and I look forward to continuing my collaboration with the CCI.

Collaborator Statement - Professor Mark Howden, Climate Change Institute, ANU College of Physical and Mathematical Sciences

I welcomed the opportunity to work with VCCAFS awardee Ngaio Fitzpatrick as I had previously worked with the arts community on a project that demonstrated that it was the combination of arts and science (as distinct from these operating alone) that most impacts on audiences and resulted in by far the greatest behavioral change. I have since taken an interest in the artistic elements of my interactions.

The scientific evidence that global and regional climate changes are happening and that humans are the predominant cause of this is overwhelming. Climate changes are also affecting many things we value (e.g. the Great Barrier Reef) and also things that we fear (e.g. bushfires). In spite of the science evidence, the lived experiences of change and the logic behind accelerated action, in some of the Western democracies and particularly Australia, the polarised politics and rhetoric combined with the scientific uncertainties appears to have gridlocked decision making in relation to both emission-reduction and climate adaptation. And the public generally, whilst acknowledging that climate is changing and that more action is needed do not seem to be motivated to act themselves – rather expecting governments to lead. One way out of this impasse is to more effectively connect the science-evidence-logic part of the issue with an artistic-narrative-emotional dimension.

Recent insights from the field of visual anthropology suggest that artistic communication strategies – such as photographs – have power because they allow for ambiguous (and multiple) interpretations, aid understanding of complex issues like climate change and provoke a range of personal and emotional responses that promote the desire for action.

Through discussions with Ngaio and her resulting installations, we have been productively exploring this interface of science and art. This partnership has been very productive and has increased the capacity of the CCI to engage with new audiences as well as interact better with existing ones. Consequently, we have suggested that Ngaio become the CCI's Artist-in-Residence. She is also exploring a PhD at ANU to extend her existing work, a great outcome for the VCCAFS program.



Ngaio Fitzpatrick, *Climate Change: The Musical (in three parts), Part One: The Romance*, 2016. Digital print on glass, 60 x 42 x 6 cm.



Ngaio Fitzpatrick, *Climate Change: The Musical (in three parts), Part Three: The Divorce*, 2016. Digital print on glass, 60 x 42 x 6 cm.

CATHY FRANZI

ANU COLLEGE OF MEDICINE, BIOLOGY AND ENVIRONMENT

RESEARCH SCHOOL OF BIOLOGY

Artist Statement

We are delicately sloshing around on a snowy November day in the boggy moss and soft grass of Upper Spencers Creek in Kosciuszko National Park. It's the ANU Research School of Biology fieldtrip and we are looking for Alpine Buttercups. Our aim is to observe the variation in leaf shape between five species of *Ranunculus* and their hybrids across a moisture gradient.

This year I have been embedded in the Nicotra Lab, where a highly engaged student team led by Professor Adrienne Nicotra researches plant physiological ecology and plant evolutionary biology. The statistics and graphs have been challenging, but what I have found particularly fascinating is phenotypic plasticity, or the range of leaf form a given genetic individual can exhibit under different environments. Leaf function is largely understood, but the functional significance of leaf shape - the purpose of diversity of form - surprisingly remains unclear. This research might be key to understanding how species could adapt to climate change and therefore assist with conservation.

In the lab I cut and weighed Yellow Box Gum leaves, in the experimental glasshouse I saw how *Pelargonium* species grow across a wide range of habitats and in the field I examined Buttercups, unfortunately unable to crack the big question. However through the fellowship I gained a deeper understanding of leaf complexity and scientific process and reasoning, and applied my knowledge of ceramic material and visual language to the enquiry.

Rather than use my customary practice of mark making into the clay surface of a wheel thrown form, I explored ways to accurately image each leaf, rather like the way the digital scanner in the lab collects data. Porcelain has the ability to capture the finest detail of an impressed leaf and its translucency reveals each variation when held to light. The techniques I applied to utilise these properties determined the essential structure of the form, but like in biology, ceramic vessel vocabulary has its own scope of function, shape and variation. The structure stayed constant but the proportion and addition of spouts, tubes, handles and openings shifted shape. Form follows function, in a ceramic vessel as well as in a leaf. Or does it?



Cathy Franzi, RSB fieldtrip, Upper Spencers Creek, November 2016. Image courtesy the artist.

Collaborator Statement - Professor Adrienne Nicotra, Research School of Biology, ANU College of Medicine, Biology and Environment

When Dr Cathy Franzi approached me about being a VCCAF in my group, I had never before had a collaboration with an artist, and wasn't quite sure what such a collaboration might mean. Our school had hosted a Fellow previously and found it a rewarding experience, so this seemed an apt opportunity to continue that engagement. Cathy has considerable experience working with Australian native plants and thus the complementarity between her work and the

evolutionary ecology research in my lab was striking from the outset. For me, it was an experiment to explore how our approach to botanical research would be incorporated in Cathy's work, and how her perspective could provide opportunity to reflect on and potentially to inform what and why we do what we do.

While we all study plants, the interests of members of my group are fairly broad. Cathy showed great perseverance working to gain an understanding of what each member of the group does, trying to understand the unifying themes. For me, it's obvious what those themes are, so I was bemused to observe that even to members of my group the inter-relations are not always easy to explain. Cathy joined us in lab meetings and took part as the lab group worked through the year, participating as we discussed, designed, and interpreted the science that members were undertaking. I enjoyed the challenge of conveying why we do what we do in a different vein. It was fascinating, and often illuminating, to probe Cathy's reflections on and queries about the work.



Cathy Franzi, *Patterns of Distribution (in leaf shape of Australian Pelargonium species)*, detail, 2016. Porcelain, 16 x 108 x 36 cm. Image: Andrew Sikorski: Art Atelier

At the core, we explore how plants function in their diverse environments: from coastal dunes, to desert, to mountain. We are particularly drawn to leaves, and how their shape, and internal and external form are driven by and interact with

environment to determine the functional characteristics and limits of the leaf and plant. We explore the extent to which variation among plants reflects innate differences, versus plastic responses to environment. We ask how, and whether, the internal and external structures and physiology we observe conveys an evolutionary advantage.

As Cathy's project came together she explored and captured many elements of what we study – how light passes through the surface of the leaf, how water travels through the veins and their constituent vessel cells, how distinctive the shapes and surface textures of the leaves are. It was simply delightful to participate as the work has come together; it captures the beauty of the leaf as an organ, and also the connections and complexity and eternal curiosity of the relationship between form and function.



Cathy Franz, *Patterns of Distribution (in leaf shape of Australian Pelargonium species)*, detail, 2016. Porcelain, 16 x 108 x 36 cm. Image: Andrew Sikorski: Art Atelier

JEN FULLERTON

ANU COLLEGE OF ARTS AND SOCIAL SCIENCES

SCHOOL OF SOCIOLOGY AND CENTRE FOR SOCIAL RESEARCH AND METHODS

Artist Statement

For this project, I have collaborated with Dr Robert Ackland, who leads the Virtual Observatory for the Study of Online Networks (VOSON) Lab in the ANU Research School of Social Sciences and is developing new methods for studying the World Wide Web, including the visualisation and analysis of social networks and text. Dr Ackland has provided me with a steady stream of data detailing the levels of abuse directed at Australian politicians on Twitter, allowing me to explore my interest in society's capacity for "digital rage." Access to this data has given me the opportunity to discuss the use of abusive language on social media as a new and accepted form of public discourse – a digital version of toilet door graffiti, with users eagerly slandering and defaming public figures. The resulting body of work I have created for this exhibition is part data visualisation and part social commentary.

Throughout our collaboration I have become intrigued not only with the numbers of social media users who "tweet" with disproportionate levels of vitriol, but also with the subjectivity of data. For example, the "badness scale" I developed to rate each tweet would no doubt be different to that of another analyst. As an artist, I also found it inspiring to walk the line between infographic and artwork – between illustration and commentary. Rather than simply display the statistical results of my analysis, I have recontextualised the data and given it physical form, to remind the viewer that digital interactions have an impact in the physical world. Working with Dr Ackland has allowed me to further explore my interest in using sculpture to discuss the ways in which increasing levels of online interaction are changing our behaviour. The works I have created for this exhibition are inspired and informed by data, and expressed through the physicality and emotive language of sculpture.

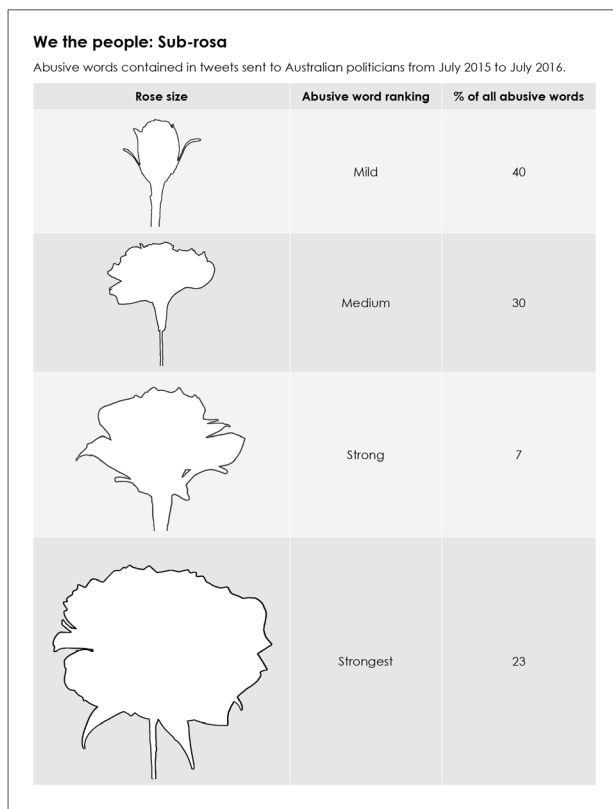


Jen Fullerton, *We the people: Sub-rosa*, 2016. Paper, 35 x 100 x 55 cm. Image courtesy the artist

Collaborator Statement - Dr Robert Ackland, School of Sociology and Centre for Social Research and Methods, ANU College of Arts and Social Sciences

It is said that the history of the universe is encoded in starlight; the job of astrophysicists is to decode vast quantities of data to understand the origins of our galaxy and ourselves. Similarly, researchers from the social sciences and other fields are decoding the digital traces that people leave behind on the World Wide Web as they go about their lives, in order to discover insights into the social, economic and political life of the early twenty-first century. Data visualisation is a key aspect of such research, and Jen Fullerton's sculptures are a visual representation of uncivil and abusive behaviour taking place in political spaces on Twitter. As part of another research project with colleagues in the School of Sociology, I collected Twitter data relating to Australian federal politicians (the tweets they authored, and those tweets where they are

mentioned, replied to or retweeted) over a period covering Malcolm Turnbull's rise to Prime Minister, and the July 2016 federal election. Jen's interest in the phenomena of cyber-bullying and abusive behaviour online encouraged me to develop an approach for identifying abusive language directed towards politicians on Twitter, and quantitatively assessing how its extent and severity varies with characteristics of politicians (gender, party affiliation), policy areas and events. This collaboration with Jen has provided a new dimension to my on-going research into online social and organisational networks. Researchers will continue to assess how online abuse, together with filter bubbles and socialbots, are affecting the potential of the Internet to make a positive contribution to democracy and our social and political life more generally.



Jen Fullerton, *We the people: Sub-rosa (legend)*, 2016. Image courtesy the artist



Jen Fullerton, *We the people: Shooting from the hip* (detail), 2016. Paper, approx 200 x 200 cm. Image courtesy the artist

ANNA MADELEINE

ANU COLLEGE OF MEDICINE, BIOLOGY AND ENVIRONMENT

MEDICAL SCHOOL

Artist Statement

My VCCAFS project researched how animation and interactivity can create a different experience of anatomy. I undertook this in collaboration with Associate Professor Krisztina Valter and Dr Alexandra Webb from the ANU Medical School.

I began this project by re-animating sequences of magnetic resonance (MR) images and computed tomography (CT) scans. As my work developed, I wanted to link these depictions of internal body structures to more personal and emotive experiences of the body – for example, swimming and yoga – to explore the relationship between the body as scientific information and the body as lived experience. Animating simple medical procedures such as blood tests or having a pulse taken convey how internal information is accessed from the outside. To reflect this, I have used heart rate sensors and experimental projection techniques to incorporate the viewer's own body in the work.

With the support of an ArtsACT grant, in 2016 I undertook a residency at the School of Cinematic Arts at the University of Southern California, where I created 360-degree videos to be experienced in Virtual Reality (VR). While VR is mostly used in anatomy for simulation and education, its strength for me as an artist is to create an experience that disconnects the viewer from their usual perceptions of the body in space.

The collaboration with Associate Professor Valter and Dr Webb unfolded through a series of meetings and an exchange of images and animations. Our dialogue often compared different ways of looking at an image: they looked at my animations searching for specific parts of the body – for example, perceiving a swimmer's legs as the diaphragm – whereas I found unexpected resemblances emerging from medical images – for example, finding faces in an MR scan.

This fellowship has led me to new technologies and animation techniques that have expanded my thinking about how the body is visualised, and how artists can give audiences new experiences of the body in space. My future aims are to explore anatomy in relation to organ donation, as well as further experimentation with interactivity, projection and VR.



Anna Madeleine, *Body Parts*, 2016. Animation still, dimensions variable. Image courtesy the artist

Collaborator Statement - Associate Professor Krisztina Valter, Associate Director (HDR) and Dr Alexandra L Webb, Medical Education Unit Medical School, ANU College of Medicine, Biology and Environment

It was an honour to be approached by Dr Anna Madeleine to collaborate with her on her VCCAFS Fellowship. We teach anatomy at the Medical School and Research School of Biology. Our anatomical research program encompasses the investigation of innovative educational approaches to enhance student understanding of the structure and function of the human body. This research

has led us into the worlds of virtual reality, touchscreen technology and 3D printing. We are particularly interested in how these technologies can be used to facilitate student learning of structures deep inside the human body and the appreciation of their relationships to neighbouring structures when viewed in different planes.

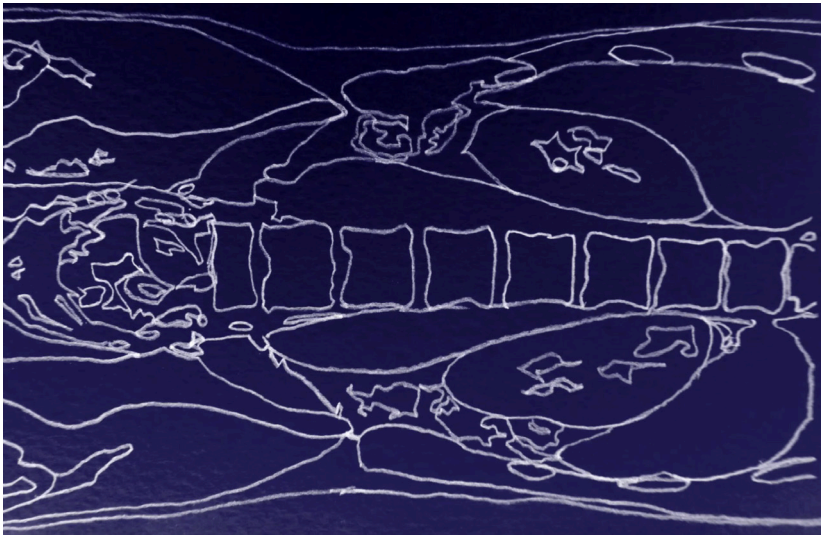
When we first met with Anna, she was interested to create a visual work of the human body that viewers could interact with to appreciate how their own body functions. We were captivated by her skills in stop-motion animation and virtual reality and discussed how this could be used to immerse the viewer in the internal structures and workings of the human body. Anna Madeleine's previous stop-motion animation work reminded us of computed tomographic (CT) and magnetic resonance (MR) images. This led to Anna's first endeavour re-animating CT and MR images from different parts of the body in a variety of planes. The animations draw the viewer inside the body and the colours she has used helped re-conceptualise the images and bring them alive. Her use of medical imaging to create animations is particularly effective in revealing the inner structures of the human body and engaging medical students in the art of medical imaging.



Anna Madeleine, *Chest*, 2016. Animation still, dimensions variable. Image courtesy the artist

Anna has since gained skills in virtual reality during her residency at the School of Cinematic Arts at the University of Southern California. This has enabled her to incorporate these new abilities to further enhance the viewers' experience of the internal structures of the human body. By relating every-day activities (swimming, yoga) to medical images allows the comprehension of the full beauty, skills and abilities of the human body.

A highlight of Anna's fellowship has been the opportunity to exhibit her animations at the Australian & New Zealand Association of Clinical Anatomists conference, where she attended anatomy drawing workshops and connected with other academics using virtual reality.



Anna Madeleine, *Torso*, 2016. Animation still, dimensions variable. Image courtesy the artist

JENNIFER ROBERTSON

ANU COLLEGE OF PHYSICAL AND MATHEMATICAL SCIENCES

RESEARCH SCHOOL OF EARTH SCIENCES

Artist Statement

My textile research focuses on exploring meaningful connections, correlations and analogies between geology and weaving. Geology, with its outward forms and surfaces is informed by what is normally unseen in its molecular and atomic structures.

Fostering a first-time collaboration with the ANU Research School of Earth Science (RSES) and Emeritus Professor Ian Jackson has facilitated a new, meaningful dialogue between geology and weaving. Specifically, we have focused upon RSES pivotal research into “defects” or “flaws” – vacant sites and dislocation lines running through atomic and molecular crystal lattice structures of minerals such as olivine.

Paradoxically, “defects” in weaving are always unwanted and every attempt is made to eradicate them at every stage of the preparation and weaving process. This in itself presented an interesting challenge – how to make defects intentional, intrinsic and the focus of aesthetic, technical and physical research in cloth. Early on in the project I was drawn to the many scientific symbols, grids and diagrams used to portray, educate and convey information about different aspects of mineral structures.

Weaving is inherently a grid system with horizontals and verticals intersecting to form intrinsic pattern and structure based upon math. After some experimenting, I responded by weaving double-cloth disrupted pattern and structure to form dislocation faults, highlighted in red copper over an olivine grid structure.

Guiding the physical and aesthetic approaches to weaving has included international sourcing of key mineral fibres such as basalt, glass, stainless steel, copper and silver. Each of these fibres has its own set of technical requirements in the weaving process, leading to between four to six shuttles thrown across the loom in the weft for every row of visible weaving, each one demanding different treatment as behaviour varies radically. Weaving rock seems absurd yet has offered exciting and strategic new directions for my practice-led research in woven textiles.

Approaching the collaborative research project with a scientifically correct perspective offered clarity - of parameters, purpose and outcome. Whilst some introduction time was needed at the start, the project quickly developed into an inventive and creative collaboration that has highlighted the strategic nature of research focussing on natural defects, deformations, faults and flaws.



Jennifer Robertson, *Crystal Imperfections as Agents of Deformation*, detail, 2016. Basalt, stainless steel, copper, silk, silver and polyester, hand-woven on digital loom, 120 x 250 cm.



Jennifer Robertson, *Tetrahedrons in Olivine*, detail, 2016. Basalt, stainless steel, copper, silk, silver and polyester, hand-woven on digital loom, 120 x 250 cm.

Collaborator Statement - Emeritus Professor Ian Jackson, Research School of Earth Sciences, ANU College of Physical and Mathematical Sciences

Emeritus Professor Ian Jackson's scientific research is well-described as “rock whispering” – an activity which involves coaxing out of rocks the closely-guarded secrets concerning their mechanical behaviour. This is done through laboratory experiments under controlled conditions of pressure, temperature and stress, which simulate those prevailing within the Earth's deep interior.

The mechanical properties of rocks are of central interest in geophysics, both in understanding the structure of the Earth's interior as revealed by seismic waves and its capacity to deform like a viscous fluid on the long timescales of plate tectonics.

Some physical properties of minerals and rocks are determined by the way in which the constituent atoms are packed into regular arrays called crystal lattices. However, the high-temperature mechanical behaviour of rocks is

controlled by defects or flaws in the regular packing of atoms in crystalline minerals. These defects range from vacant lattice sites which create space for the migration of atoms through crystal structures, through line defects called dislocations which move under stress to allow crystals to change their shape, to grain boundaries grains which are zones of weakness that allow deformation by relative movement between adjacent grains.

The weaving by Jennifer Robertson is evocative of both the overall regularity of the atomic arrangements within the crystalline lattice and also the presence of flaws or defects in the crystalline structure. Such defects are the agents of high-temperature deformation, facilitating the slow convective stirring of the Earth's crystalline silicate mantle, that is expressed at the surface in the movements of the tectonic plates.

ARTIST BIOGRAPHIES

Tony Curran is a Canberra-based artist and sessional academic at the ANU School of Art & Design, in Painting and Foundation studies. He was awarded a PhD in Fine Art from Charles Sturt University (CSU) in 2015 for research into contemporary portrait practices as informed by contemporary philosophies of self and aesthetics. Curran also holds a Masters of Art (Drawing) from the University of New South Wales, a Bachelor of Visual and Performing Arts (Honours) from CSU and a Bachelor of Science (Psychology) from Macquarie University. Curran has been a finalist in the 2015 Archibald Prize, the 2014 Brett Whiteley Travelling Art Scholarship and the 2008 Mosman Art Prize. His work has been shown at the Canberra Contemporary Art Space, the National Portrait Gallery, University of Edinburgh, S.H. Ervin Gallery and the Art Gallery of New South Wales.

Ngaio Fitzpatrick completed an Honours degree with the ANU School of Art & Design, Glass workshop in 2013 using industrial glass and video as a means to explore the human relationship with the built and natural environments. Since graduating, Ngaio has exhibited work widely, had work published in the Corning Museum of Glass New Glass Review, been awarded an Emerging Artist Support Scheme exhibition and several residencies. Her practice has evolved to include performance, site specific installation, and collaborations to draw attention to issues surrounding climate change. She has a background in environmentally sustainable architecture and building informing her arts practice and has won several design awards.

Cathy Franzi is a graduate of the PhD program of the ANU School of Art & Design, Ceramics workshop. Through her art practice she explores the cultural values attributed to plant species, their interconnection within ecosystems and how botanical and environmental knowledge might be expressed. In 2010 she graduated with a Master of Visual Arts (ANU) receiving the Nelson Nichols Scholarship in Ceramics and she also holds a Bachelor of Science from the University of Sydney. Franzi has travelled extensively, working in the ceramics field in Ireland, the UK and New Zealand. In 2013, Canberra's centenary year, a work from her solo exhibition *Painting the Hills of Canberra* was included in the Canberra Centenary Time Capsule. Her work is held in public collections including Manly Art Gallery and Museum, the ACT Legislative Assembly Art Collection and Canberra Museum and Gallery. Cathy Franzi is represented by Sabbia Gallery in Sydney and Beaver Galleries in Canberra. For more information see: www.cathyfranzi.com.

Jen Fullerton is a current PhD candidate at the ANU School of Art & Design, Sculpture workshop, having completed her Bachelor of Visual Arts (Honours) at the ANU in 2013. Her PhD research juxtaposes the physicality and analogue language of sculpture with society's constant engagement with, and reliance upon, a virtual, digital environment. Jen's work has been represented in several major art prizes and exhibited widely throughout Australia. For more information, see www.jenfullerton.com.au.

Anna Madeleine is an emerging artist working with mixed media, installation and experimental animation. Through explorations of time and mapping, her practice aims to create poetic interpretations of scientific data, networks and infrastructure that underpin contemporary culture. Anna completed a PhD in Media Arts in 2014 at University of NSW Art & Design, and a Bachelor of Visual Arts (Honours) at ANU School of Art & Design in 2007. She has had solo exhibitions at CHASM Gallery (New York), MILS Gallery, Paper Plane Gallery, 107 Projects (Sydney), Canberra Contemporary Art Space, and Lab-14 Gallery, Melbourne. In 2016 she was selected for SafARI 2016, the Not Fair Art Fair, the Churchie National Emerging Art Prize, and undertook a visiting artist program at the University of Southern California after receiving a Project Funding grant from Arts ACT. She is currently a studio artist at ANCA, Canberra.

Jennifer Robertson studied at West Surrey College of Art and Design, Royal College of Art, UK and Fondazione Arte della Seta Lisio, Florence, Italy. In 1987 she established a weave studio in Fremantle, WA and joined the staff at ANU School of Art & Design in 1997. Jennifer is an internationally renowned woven textile specialist and researches, lectures and exhibits nationally and internationally. Research highlights include a two year Australia Council Visual Arts Fellowship 2001-2003 and one year ArtsACT Creative Fellowship 2005. In 2016, Jennifer Robertson exhibited and presented at the 11th International Biennial Contemporary Textile Art Exhibition Scythia, in Kherson, Ukraine and at "From Lausanne to Beijing 9th International Fiberart Biennial", Shenzhen, China. Her work is included in numerous public, private international and national collections, including the Cooper Hewitt Smithsonian Design Museum, New York, USA, NUNO Corporation, Tokyo, Japan and National Gallery of Australia.

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ABOUT THE SCHOOL OF ART & DESIGN

The Australian National University (ANU) School of Art & Design (SOA&D) equips students with specialised skills for professional careers in the visual arts, media arts and design industries.

Our philosophy embraces an interdisciplinary and flexible approach to art education, where new technologies augment traditional media.

We are internationally recognised for studio-based teaching across the disciplines of Ceramics, Design, Furniture, Glass, Gold and Silversmithing, Painting, Photography and Media Arts, Printmedia and Drawing, Sculpture and Textiles. Our dedicated Centre for Art History and Art Theory (CAHAT) offers acclaimed courses to develop critical thinking and curatorship skills. To enhance potential for cross-disciplinary research, we give students the unique opportunity to combine art and design disciplines with subjects across ANU in our Flexible Double Degree program.

Our staff are renowned practising artists and researchers who lead hands-on courses. Students have access to a range of creative facilities and equipment including our Digital Fabrication Lab and Inkjet Research Facility, as well as a dedicated art library and several multi-purpose gallery spaces.

Located in an iconic art deco building on the ANU campus in central Canberra, the school has drawn on its proximity to Australia's national galleries and museums to build a strong reciprocal relationship with major cultural institutions for teaching and learning.

Our artist-in-residence and international exchange program have established strong connections with a global network of leading artists and institutions, and through outreach programs and free public lecture series we enliven the cultural community of Canberra.

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