

February 2021

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AIMS@JCU Awards

Congratulations to all of the students who were successful in their applications for the following awards:

Science Communication Awards

Luke Morris, Emma Marangon & Josephine Nielsen for conference travel/online conference registrations and **Mikaela Nordborg & Paul O'Brien** towards journal publications.

Pilot Research Awards (\$1,000 each)

Kevin Bairos-Novak, Ramona Brunner, Alexandra Gulizia, Shiori Kanno, Joan Li, Magena Marzone, Michaela Miller & Geoffrey Yau.

Look out for summaries of their travel and research in future newsletters.

The first round of AIMS@JCU applications for 2021 will open shortly for AMSA awards, Pilot Research awards and Science Communication awards. Keep an eye out for an email with more details in the near future.

2021 AIMS@JCU PhD Scholarship Students

Congratulations and welcome to the successful applicants of the 2021 AIMS@JCU PhD scholarship round: **Martina Burgo, Valerie Comet, Lok Ting Kwong, Marine Lechene and Marko Terzin** – look out for their bios in this and future newsletters.

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Photographs in this publication were submitted by AIMS@JCU members unless otherwise stated

About the AIMS@JCU Newsletter:

This newsletter is produced quarterly and distributed by email to AIMS@JCU members, AIMS and JCU staff.

If you'd like to be added to our mailing list, or have a query regarding this newsletter, please contact:

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2020 AIMS@JCU PhD scholarship recipient

Redbird Ferguson

Redbird has a passion for how Indigenous cultural knowledge and heritage can enhance our understanding and improve management practices of natural ecosystems and human-environment interactions. Redbird received her Bachelor of Arts degree with a double major in Anthropology and Archaeology from James Cook University (JCU), followed by First Class Honours in Archaeology at JCU in 2019. She has participated in field work throughout northern Queensland and Tonga, working and volunteering on archaeological and cultural heritage projects with Traditional Owners. The research projects that Redbird has been part of have been focussed throughout North Queensland and the Pacific, including Dingaal Country (Lizard Island Group), Gugu-Badhun (Greenvale area) and Wik-Waya (Weipa area) country. Redbird's professional experience extends to working in Protected Area Management with the Wet Tropics Management Authority.



Redbird has commenced her PhD co-developing a best practice framework for Indigenous cultural mapping for management of Sea Country. Her candidature is supervised by Dr Karen Joyce (JCU), Dr Christian Reepmeyer (JCU), Dr Rachel Groom (AIMS) and Dr Kellie Pollard (CDU). Redbird's research is part of the AIMS Indigenous Partnerships Plan project.

This project will work with Indigenous peoples using a two-way sharing of knowledge and perceptions of risks to country and contribute to place-based risk reduction strategies. The aim of this research is to co-develop an Indigenous mapping framework to improve the way Indigenous cultural knowledge and values are brought alongside Western Science to inform Indigenous-led Sea Country management. She will work with Indigenous peoples in a two-way sharing of knowledge and perceptions of risks to country and contribute to place-based risk reduction strategies. This will establish a best practice framework for collaborative approaches to Indigenous cultural mapping of Sea Country and build capacity to empower Sea Country managers to move towards autonomous management of their country. This outcome will enable Sea Country managers to advocate and leverage their knowledge of country more effectively when engaging with state and corporate structures.

Tiffany Sih

2021 AIMS@JCU PhD scholarship recipient

Sarah Lok Ting Kwong

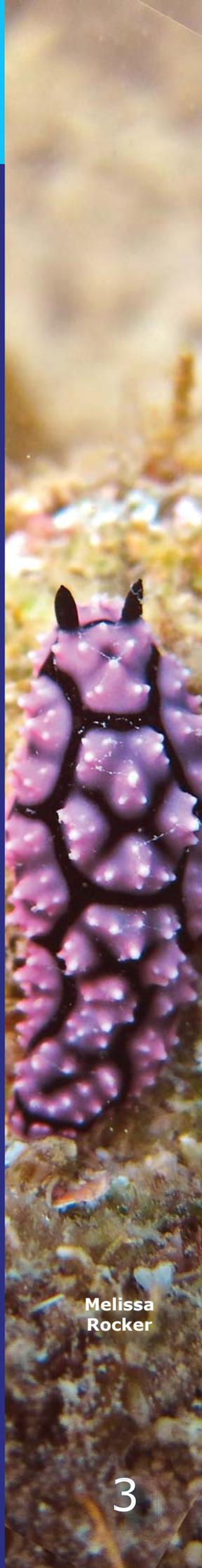
In 2013, driven by her enthusiasm towards the ocean, Sarah left her job as a pharmacist in Hong Kong to pursue her passions by working as a Scuba Diving Instructor. She has since worked at the Great Barrier Reef and in the Maldives. After witnessing the 2016 mass bleaching event right before her own eyes, she was inspired to become a Marine Biologist so that she could dedicate herself to working for coral reef protection.



Eventually, she moved to Australia to pursue her MSc in Marine Biology at James Cook University (JCU) in 2019. She has conducted her Master thesis project entitled “quantifying shedding and degradation rates of environmental DNA (eDNA) from Pacific crown-of-thorns seastar (*Acanthaster cf. solaris*)” at the Australian Institute of Marine Science (AIMS). During this period of time, Sarah has developed a keen interest in the field of scientific research and thus decided to continue her academic pursuit through a PhD.

Sarah is incredibly grateful to have been awarded the AIMS@JCU PhD scholarship in 2021. Her research focuses on the development and application of novel genetic techniques to improve the management of crown-of-thorns seastar (CoTS) outbreaks on coral reefs. Specifically, she is aiming to develop a molecular age marker for CoTS by making use of DNA methylation patterns or telomere lengths. In addition, she is passionate about the application of the metabarcoding approach to obtain population-level insights from eDNA samples. Her supervisory panel includes Dr. Sven Uthicke (AIMS), Prof. Morgan Pratchett (JCU), and Dr. Cecilia Villacorta-Rath (TropWATER).

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Melissa
Rocker

2021 AIMS@JCU PhD scholarship recipient

Marine Lechene

Project title - Identifying key indicators to quantify ecological recovery and adaptation of coral reefs across space and time

Marine Lechene is from New-Caledonia and studied in France and Australia. She completed her Bachelor's in Biology and Ecology (France) and Master's in Marine Science and Management (Australia). Her area of interest is in photogrammetry and coral reef ecology. Her significant past experiences include volunteer and Research Assistant positions at the School of Life and Environment Science (University of Sydney). This opportunity to work with the most recent photogrammetry methods and along with renowned scientists in the field allowed her to gain theoretical and practical knowledge in remote sensing and coral reef ecology. She has enrolled a PhD under the AIMS@JCU 4-year program under the supervision of Dr. Renata Ferrari (AIMS), Dr. Morgan Pratchett (JCU) and Dr. Nicholas Murray (JCU).

Her research project aims to identify key indicators to quantify ecological recovery and adaptation of coral reefs across space and time. Her project is part of the cross-cutting RRAP (Reef Restoration and Adaptation Program) subprogram EcoRRAP (Ecological Intelligence and Intervention risk for Reef Restoration) Intensification of disturbance frequency and strength due to climate change is pushing coral reef ecosystems outside their adaptive range. The effects of main disturbances (warming, storms, crown-of-thorn outbreaks) on coral reef composition and coral cover have been described, but the drivers of recovery and adaptation to disturbances are yet to be investigated. This project will use innovative and cost- efficient marine observing technologies and assessment methods over large spatial and temporal scales to investigate intra and inter-reefal variation of key indicators of reef recovery and adaptation. In turn, these results will develop predictive models and inform potential restoration initiatives to enhance management of coral reef ecosystems.

Christopher
Brunner



Where are they now?

Dr. Samm Sherman

Samantha submitted her PhD in September 2019 on a layover heading to her new job in Vancouver, Canada. She had completed her PhD and Masters at James Cook University working with Prof. Colin Simpfendorfer, Dr. Michelle Heupel, and Dr. Andrew Chin. She immediately started a post-doc working with Prof. Nick Dulvy at Simon Fraser University and Glenn Sant at TRAFFIC.



During her Masters, Samm's main thesis question was how effective is Australian fisheries management at mitigating risk of overfishing sharks and rays? During her PhD, Samm was interested in the ecology of rays on coral reefs, particularly in Southeast Asia. She worked as part of the Global FinPrint Project (GFP) and used baited remote underwater video stations (BRUVS), which consisted of a baited pole mounted in front of a camera and deployed on

coral reef ecosystems for at least one hour. Samm analysed data from over 3,500 BRUVS in 11 different countries. She found that in countries where sharks were overfished, rays became much more abundant and exhibited bolder behaviours. This work was recently published in *Marine Ecology Progress Series* and provided additional insight into how overfishing impacts coral reef ecosystems. Samm also contributed to a publication in *Nature* as part of the GFP project which showed the global status of reef sharks and the best management policies that can improve conservation of sharks.

Samm is currently working on another fisheries management project. She has created a list of measurable attributes to assess overexploitation risk of 100 species of sharks, rays, and chimaeras in global fisheries. This project aims to determine management efficacy of different countries and which species are at the highest risk based on lack of effective management and intrinsic vulnerability. The outcomes will be used to propose species to bring attention to at future CITES and CMS meetings. She is also involved in a Global Shark Trends project and has been involved in the IUCN assessments of >100 species.



Samm appreciates the help she received from AIMS@JCU, both in travel awards and AIMS day prizes. Additionally, she received help on her PhD thesis from AIMS statistician Dr. Murray Logan, which was organised by the AIMS@JCU staff.

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Mikaela Nordborg

Pilot Research Award report

Michaela Miller 2017 and 2019

I was fortunate enough to receive the AIMS@JCU Pilot Research Award both in 2017 for my Masters thesis, as well as in 2019 for my PhD. While both projects focus on microplastic research, the former was a minor project surrounding the method development for extracting microplastics out of surface seawater samples. Following on from that, my PhD uses the outcomes of that research to allow investigation into the ecological impacts of microplastics and how they travel through a food web.

Microplastic contamination in the marine environment has been recognised as an ever-increasing environmental issue. The Microplastics Team at AIMS is a relatively new group, focused on understanding the impacts of microplastics to aid in mitigation and management efforts. In order to achieve this goal, methodologies must first be developed that allow the extraction, identification and characterisation of microplastics from a sample matrix. The Pilot Research Award I received in 2017 funded the purchasing of chemicals and materials to develop such a method in the laboratory. This research alone has resulted in two publications and acts as the foundation for method development studies the Microplastics Team does prior to processing any samples. It is incredibly important to understand how methods may impact microplastics to ensure accurate quantification estimates.



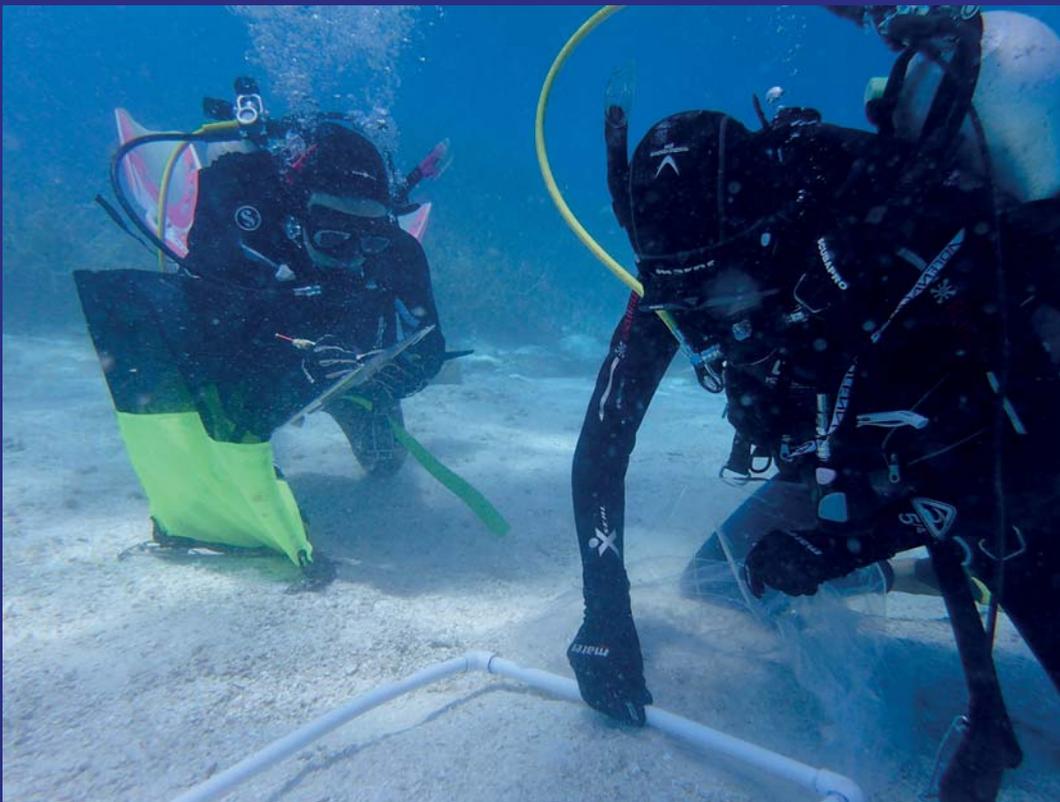
Bettina
Glasl

In 2019 I received a Pilot Research Award to provide additional funding for the first two chapters of my PhD thesis. These chapters focus on understanding the current level of microplastic contamination on the Great Barrier Reef, both in the environment as well as within organisms themselves. This includes processing a three-year dataset taken in collaboration with AIMS and IMOS at the National Reference Station Yongala, aimed at uncovering

Pilot Research Award report

Michaela Miller 2017 and 2019 continued

any temporal trends of microplastic abundance in surface water samples. Additionally, both environmental samples (i.e. sediment and water column) and organisms of a known multi-trophic level food chain were collected at Davies and Backnumbers Reefs to understand the bioaccumulation and biomagnification potentials of microplastics in reef organisms. Specifically, the Pilot Research Award helped fund lab materials and chemicals, as well as field equipment used for the collection of samples.



This work is incredibly important to inform the Microplastics Team not only with realistic concentrations of microplastics for laboratory experiments, but also the quantity of microplastic pollution and how it moves through an ecosystem as important as the Great Barrier Reef. Without the Pilot Research Awards I received in both 2017 and 2019, these projects would not be completed. I'd like to thank AIMS@JCU for providing me with the ability to complete research.

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Geoffrey
Yau

Research Director Report

With 20/20 hindsight, we can now take stock of the year that was and get excited about the year to come.

Against the backdrop of COVID-19 and steered by the steady hands of Libby and Lauren, AIMS@JCU continued to support the student cohort. Key programs such as Murray Logan's R-Course and the AIMS@JCU Student Awards prevailed, some such as the AIMS@JCU Pomodoro went virtual, while unfortunately others including the AIMS@JCU Seminar Day and writing retreat were cancelled. However, as the year drew to a close, and the Townsville community collectively held the virus at bay, the JCU Townsville campus celebrated its new indigenous language name 'Bebegu Yumba', and we enjoyed each other's company in person at the AIMS@JCU Christmas party under the backdrop of the scenic (and very yummy) Shore House.

Over the past year we have grown in numbers; we recently welcomed Dr Cherie Motti in the new role of Assistant Research Director and Scott Bainbridge, Stephanie Duce, Renee Gruber, Jon Kok, Frances Patel, Mostafa Rahimi Azghadi, Christian Reepmeyer and Jan Strugnell as supervisory staff. A warm welcome also to our new AIMS@JCU PhD scholarship students Martina Burgo, Valerie



Comet, Lok Ting Kwong, Marine Lechene and Marko Terzin into the AIMS@JCU cohort, while Leanne Currey-Randall and her husband Aaron delivered their own special addition to the AIMS@JCU family, Ella Jane Randall born Friday 5th February.

As the end of the current AIMS@JCU Strategic Alliance Agreement appears on the distant horizon, we have had discussions both at AIMS and JCU towards a renewed AIMS@JCU. Both AIMS and JCU value the important partnership, and the future of AIMS@JCU is looking bigger and better than ever! More details soon.

Don't forget that AIMS@JCU is your extended family. Please do not hesitate to reach out to us, we are here to support you and will always advocate for your needs.

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Christopher
Brunner