



Christopher Brunner

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CONTENTS

Merry Christmas and a happy new year!

What a great way to round off the year - the AIMS@JCU Christmas gathering was a really wonderful event with students, supervisors, management and office staff all able to let their hair down and enjoy a social get-together with a bit of networking thrown in. Thank you to everyone who attended for their exemplary behaviour as always.



We've had some happy news this year from our lovely student and alumni members including Cecilia Pascelli who gave birth to a beautiful baby boy and Leanne Currey

and her lovely partner Aaron who got married earlier this year. Congratulations to you both and to everyone else who has experienced big life events this year. We love being kept in the loop even after our students graduate.

We wish all of our members a happy holidays and all the best for 2018!



2017 PhD Scholarship award recipient profile	2
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2017 AIMS@JCU Student Seminar Day	3
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2017 Pilot Research Award write-up	5
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ATSIMS 2017 Report	6
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Research Director's report	8
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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:

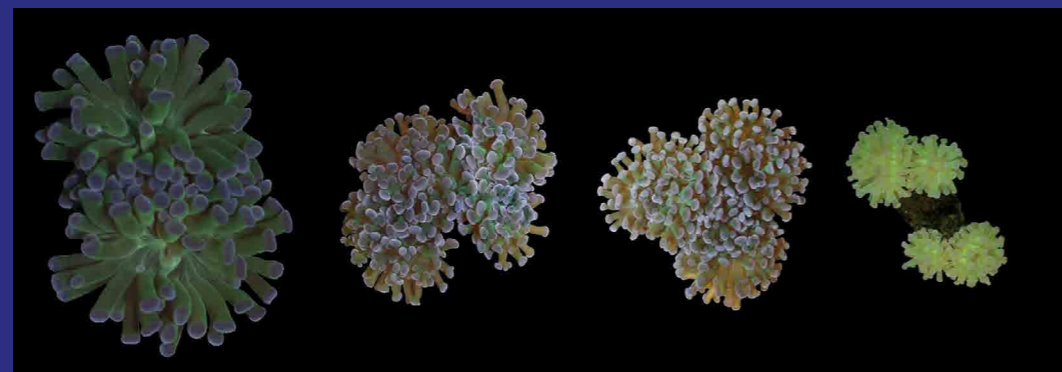
Editor: Lauren Gregory
Email: aims@jcu.edu.au

2017 PhD Scholarship recipient

Luke Morris

Luke graduated with a MSc. in Marine Biology from the University of Southampton (UK) in July 2015 following four years of study. In the final year of his degree, he studied the nutrient physiology of the coral *Euphyllia paradivisa* in the university's Coral Reef Laboratory under the supervision of Dr. Sabrina Rosset, Prof. Jörg Wiedenmann and Dr. Cecilia D'Angelo. Luke's project examined the effects of inorganic nutrient and particulate food availability on coral physiology and used fluorescent methods to monitor symbiont lipids and host pigmentation. Following graduation, Luke conducted further experiments to determine the response of his nutrient-perturbed corals to thermal bleaching.

In March 2017 Luke commenced his PhD and will work with samples collected during the 2017 bleaching episode to further examine the links between coral nutrition and bleaching. This project forms part of NESP 3.3.1 under the supervision of Dr. Line Bay (AIMS), Dr. David Bourne (JCU) and Dr. Mark Baird (CSIRO). His PhD project seeks to clarify the role of environmental nutrient availability in coral thermal tolerance using a combination of field samples, *Symbiodinium* cultures and SeaSim experiments on multiple species of coral. These results will help to inform the water quality management of the Great Barrier Reef by determining how specific nutrient regimes influence coral bleaching resistance and resilience.



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2017 AIMS@JCU Student Seminar Day

We had yet another amazing AIMS@JCU student seminar day this year, with a really high standard of presentations from our student members. Special thanks goes to our judges (Peter Doherty, Rhondda Jones, Liz Tynan, Cherie Motti, Richard Davis and Kate Green); our session chairs (Felicity Kuek and Lyndon Llewellyn); and to Heidi Luter for her wonderful alumni keynote and also Nicole Webster for her inspiring closing remarks.

Sincere congratulations to the following presenters who won a prize which can be spent on future science communication:

Seminar Talk Winners:

First: [Danielle Asson](#) \$1,500

Runner Up: [Katarina Damjanovic](#) \$1,200

People's Choice: [Jonathan Barton](#) \$600

Judges highly commended [Mikaela Nordborg](#) & [Jonathan Barton](#)

Speed Talk Winners:

First: [Ana Barbosa Martins](#) \$1000

Runner Up: [Blake Ramsby](#) \$800

Poster Winners:

First: [Samantha Sherman](#) \$800

Runner Up: [Felicity Kuek](#) \$600

Photography/Imagery Winners(\$100 each):

Quantitative Marine Science: [Blake Ramsby](#)

Research in Action: [Christopher Brunner](#)

Research Subject: [Christopher Brunner](#)

Photomicrograph/Macro: [Christopher Brunner](#)

People's Choice: [Christopher Brunner](#)

Illustration: [Hannah Epstein](#)

The winning images are on display in the AIMS@JCU corridor (DB17 1st floor) at JCU and photographs of the winners receiving their certificates follow in the order above.

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Brunner



My project investigated how corals cope with day-to-day fluctuations in benthic daily light integrals (DLI) driven by changes in water clarity and clouds. My experiment was designed with four contrasting DLI treatments: 'high light' (potentially photoinhibiting conditions), 'low light' (potentially light-limiting conditions), and two 'variable light' treatments that alternated between high and low conditions. The award allowed me to customize the trays I had in my experimental tanks to ensure that all corals received the correct DLI conditions, as I inherited non-ideal tanks for the experiment. I was then able to use the funding to purchase consumables to process my corals to compare pigment and protein concentrations between treatments to further my understanding of their photophysiological response and make my data more publishable. The project went on to be presented at the 2017 ACRS conference in Townsville. Thanks to AIMS@JCU for their support of my research!



Figure 1: Experimental set up – 16 tanks, 4 light treatments, black dividers to reduce light spillover.

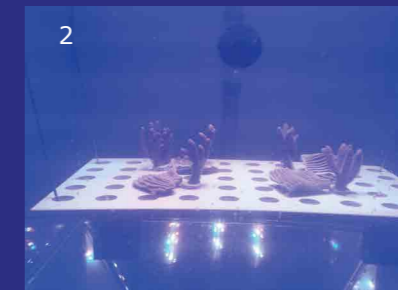


Figure 2: Each tank contained 4 nubbins per species (*Pachyseris speciosa* and *Acropora millepora*). Light was measured at location of each nubbin to ensure they all received the proper light dose.

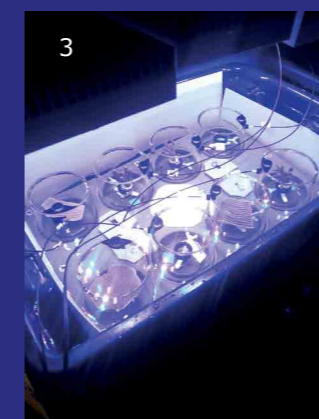


Figure 3: A selection of nubbins from both *P. speciosa* and *A. millepora* placed within 634 mL stirred chambers fixed with an oxygen spot sensor to assess oxygen consumption/production under a range of light conditions. Results enabled estimates of photosynthetic dynamics such as maximum photosynthetic capacities, dark respiration rates and saturating irradiances, which can indicate photoacclimation to high or low irradiance levels.



Figure 4: (A) Pigment quantification through ethanol extraction and (B) wax dipping of bleached skeletons to get a surface area estimate for pigment and protein standardisation between coral nubbins

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AIMS@JCU are proud to continue supporting this amazing program

Executive summary

Aboriginals and Torres Strait Islanders in Marine Science (ATSIMS) empowers Indigenous secondary students in North Queensland to pursue study and careers in marine science and management. Since 2013, 199 Indigenous high school students have graduated from the ATSIMS program. Our scholars hail from 11 schools spanning a 200 km stretch of the Queensland coast from the Burdekin to Ingham. In 2017, ATSIMS grew by 37%, engaging with 52 students (up from 38 in 2016). Students participated in a unique, five-part program including: in-class presentations at each participating school, a day trip to Reef HQ Aquarium, a day trip to the Australian Institute of Marine Science, a two-night stay on Orpheus Island Research Station, and a careers fair and awards ceremony at James Cook University (JCU), Townsville. Program modules were delivered in partnership with Indigenous and non-Indigenous researchers, marine managers, rangers, students, staff and volunteers.

Participation in the ATSIMS program leads to quantifiable benefits in both the short and long terms. In the short term, students report increased confidence, aspiration and motivation. Over the course of the program, statistically significant increases were reported in students' interest in attending university, interest in marine science and science careers, and snorkeling and laboratory proficiencies (Student t-test, $p < 0.0001$, Figure 1a).

This augmented aspiration translates into increased preparation for university attendance. Teachers report that many ATSIMS alumni select Science Technology Engineering and Maths (STEM) subjects in Years 11 and 12. Teachers also report positive changes in students' behaviour, including decreased school absences, increased maturity and focus on academic studies, more confidence in leadership roles, and more self-belief in their ability to achieve. Many students have a greater sense of self and belonging after participating in ATSIMS.

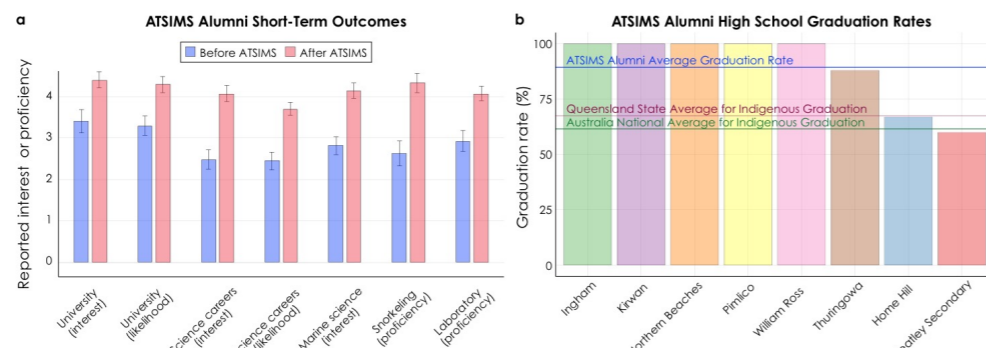


Figure 1: a) Short-term benefits of the ATSIMS program reported by students and b) percentage of ATSIMS alumni completing Year 12 (2015 and 2016 combined)

Contact: carolyn.luder@atsims.com for a copy of the full report

Perhaps most excitingly, ATSIMS alumni are graduating high school at rates far higher than state and national averages for Indigenous students. Finishing year 12 leads to greater career success and employment opportunities, which benefits students and their wider communities. 92% of ATSIMS alumni due to graduate high school in 2015 or 2016 (i.e., participants in the first two ATSIMS cohorts in 2013 and 2014) have now graduated. This is well above the national (62%) and Queensland (68%) averages for Indigenous graduation. Statistically, ATSIMS alumni graduation rates are higher than both the national ($p = 0.002$, Student t-test) and state ($p = 0.007$) averages and are statistically indistinguishable from non-Indigenous graduation rates ($p = 0.63$) (Figure 1b).

ATSIMS graduates are now pursuing university degrees. 20% to 39% of ATSIMS high school graduates are currently enrolled in university, with all but one studying at JCU, Townsville (enrolment uncertainty is due to the difficulty of tracking students after Year 12). University courses selected by ATSIMS alumni include Bachelor of Biomedical Sciences, Bachelor of Arts/Science (Marine Biology), Bachelor of Education (Primary), Bachelor of Psychological Science, Diploma of Higher Education (Science), Bachelor of Communication, Bachelor of Nursing and Bachelor of Social Work.

As they embark on their career paths, ATSIMS graduates will likely face significant challenges, but ATSIMS will continue to adapt to the changing needs of our alumni. Aboriginal and/or Torres Strait Islander people studying at JCU make up 5.3% of the student body (2015), which is higher than the Australian average (1.5%). Similar to national results, there is a clear trend of Indigenous students dropping out of STEM courses at JCU. ATSIMS aims to curtail this trend by working with JCU and our other program partners to help ATSIMS alumni succeed at the university level. In order to improve enrolment of Indigenous students at university, and ultimately fill more careers in marine science and management by Traditional Owners, it is important to partner with schools and students early to build up their interest and capacity around STEM, and continue nurturing these relationships throughout students' career paths.

The success of ATSIMS is due to the strong partnership support we receive. We are grateful for the support of our 2017 program sponsors: James Cook University (Indigenous Education and Research Centre), the Australian Institute of Marine Science (AIMS), AIMS@JCU, World Wildlife Fund Australia, Gudjuda Reference Group Aboriginal Corporation, Giringun Aboriginal Corporation, U.S. Department of State, Department of Heritage and Environment Protection, Great Barrier Reef Marine Park Authority, Australian Research Council Centre of Excellence for Coral Reef Studies, Glencore, Catholic Education Office Diocese of Townsville, Museum of Tropical Queensland, Reef HQ Aquarium, SeaLink and Oregon State University. The following report provides an overview of the accomplishments of the ATSIMS program in 2017.

Research Director Report

We have just completed the annual task of reviewing scholarship applications for proposed new PhD candidates hoping to commence in 2018. I always find it quite inspiring to review the innovative new project ideas and scientific talent seeking to commence projects with AIMS@JCU. However – this year we were particularly impressed with the high quality and diversity of candidates and projects proposed. Our Management Committee and Scientific Advisory Committee had a very difficult job. The Graduate Research School will advise applicants of the outcome in due course.

I hope that everyone has now taken the opportunity to access our new website. Special thanks to those who participated in testing out its functionality. We are looking forward to the greater flexibility of this new platform and keeping it updated with relevant information throughout the year.

It's been great to see the number of associate membership applications coming through for JCU students seeking internships and work experience placements at AIMS. AIMS@JCU recognises the benefit and value of these placements to AIMS, JCU and the students involved; and we are pleased to facilitate them with transport between JCU and AIMS. However, this relies on everyone following the car booking system and identifying their travel needs in a timely way and with enough notice to organise the second vehicle if needed. Your efforts to assist with this are appreciated.

On the topic of vehicles – I have been asked to pass on a reminder that the speed limit on AIMS property is 20km/hour. This does not single-out AIMS@JCU car users, but is rather a part of a universal reminder to everyone who drives to AIMS.

It's hard to believe that 2017 is almost over! Huge thank you to Lauren Gregory, Melissa McLean and Cherie Motti for keeping things rolling at AIMS@JCU this year especially during my unplanned extended absences. I hope that all AIMS@JCU members have a wonderful Christmas break, and I look forward to seeing everyone in 2018.

Libby Evans-Illidge, AIMS@JCU Research Director

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