



Michelle Heupel

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## AIMS@JCU has four new PhD scholarship students!

AIMS@JCU is proud to announce that we have four successful PhD scholarship recipients to add to our student cohort.

Congratulations to:

Catalina Aguilar Hurtado - Transcriptomic analysis of coral immunity; supervised by David Miller (JCU) and David Bourne (AIMS).

Christine Altenrath - Coral Reefs of Today: Sponge Reefs of the Future; supervised by Nicole Webster (AIMS) and Marcus Sheaves (JCU).

Patrick Bürger - The role of viruses in coral diseases: present and future; supervised by Bette Willis (JCU) and Madeleine van Oppen, Karen Weynberg and Elisha Wood-Charlson (AIMS).

Geoffrey Collins - Physiology of barramundi to thermal and hypoxic stress in a changing climate; supervised by Tim Clark (AIMS) and Dean Jerry, Guy Carton and Jodie Rummer (JCU).

Each student has been awarded a JCU Postgraduate Research Scholarship and an additional stipend top-up or operational expenses award of \$5,000 per year for up to four years. Their profiles are on the following pages of this newsletter.

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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 and JCU staff.

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## 2013 AIMS@JCU PhD Candidate

Catalina Aguilar Hurtado

Catalina was born and grew up in Colombia, where she completed her BSc in Biology at University of Los Andes and completed a thesis on Caribbean octocoral systematics. Upon completion of her degree she did two internships at research stations in South America before joining, in 2008, master program at the University of the Ryukyus in Okinawa, Japan. During the next two years she studied the systematics of an octocoral family (Melithaeidae), which involved sampling corals throughout the Ryukyu Archipelago. In 2011 she began her PhD studies at JCU within the School of Pharmacy and Molecular Sciences and ARC Centre of Excellence for Coral Reef Studies under the supervision of Dr David Miller.



Catalina's research investigates the effects of ocean acidification and climate change on two key biological functions, the coral innate immune response and sulphur cycling, respectively. The first project is based on studies in mammals and *Drosophila* that show suppression of the innate immune system and compromised resistance to disease with increasing  $p\text{CO}_2$ . Here, Catalina is using trancriptomic analysis to determine how the coral immune response is affected by elevated  $p\text{CO}_2$  conditions. By using next-generation DNA sequencing we will determine the short and long-term responses of the coral immune system under different environmental stress conditions.

For the second part of her research, she will analyse the response of putative genes involved in sulphur cycle under thermal stress. This project would help us understand if corals are able to produce dimethylsulfoniopropionate (DMSP) in the absence of its associated zooxanthellae, which are major DMSP producers. This research is based on studies done by Dr David Bourne and Jean-Baptiste Raina and would be done with their collaboration.

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## 2013 AIMS@JCU PhD Candidate

Christine Altenrath

Christine studied biology at the University of Cologne and completed her M.Sc. degree at AIMS under the supervision of Dr. Sven Uthicke. During this project, she investigated the photophysiology of benthic symbiont bearing foraminifera under different nutrient and temperature conditions. The long-term goal of the Water Quality and Ecosystem Health Team is to utilise foraminifera as indicators for changes in water quality.

Currently, Christine is working as a research assistant at the University of Cologne's Institute of Biochemistry. Her team is studying the structure and function of different proteins, with the main focus on obtaining their crystal structures.

In July, Christine will start her PhD at AIMS under the supervision of Dr. Nicole Webster (AIMS) and Assoc. Prof. Marcus Sheaves (JCU). In this project we hypothesise that the coral reefs of today will become sponge reefs in the future, as sponges and corals respond differently to changing ocean chemistry and environmental conditions.

Genomic, observational, and modelling approaches will be used in a combination of *in situ* and laboratory experiments to understand how global warming and ocean acidification will impact on sponges and how reef ecosystems might function with sponges as the dominant fauna.



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## 2013 AIMS@JCU PhD Candidate

Patrick Buerger

Patrick Buerger is originally from Germany and came to Australia in 2012 for the International Coral Reef Symposium in Cairns. He continues his studies in Townsville.

Patrick is interested in the effects of anthropogenic impacts on marine ecosystems and the sustainable use of marine resources. His previous work focused on coral reef ecology and coral adaptation / acclimatization to climate change using genetics and genomics.

Patrick is currently conducting a PhD on marine viruses and coral diseases with Bette Willis, Madeleine van Oppen, Elisha Wood-Charlson and Karen Weynberg.

This PhD project aims to investigate the identity and possible role of viruses in coral diseases, in the context of viruses both as a causative agent and as a mechanism for therapy as well as their possible source and future scenarios. Although viruses are the most abundant biological entity in the sea, not much is known about the role of viruses in coral reef ecology and coral diseases.

Patrick is looking forward to starting his PhD in March – it will be an exciting time! Please contact him with any questions.



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## 2013 AIMS@JCU PhD Candidate

Geoffrey Collins

Geoff grew up in Port Lincoln, South Australia and completed a Bachelor of Technology/Aquaculture (Honours) at Flinders University in Adelaide in 2010. He was employed as a research assistant at the National Marine Science Centre (Coffs Harbour) and CSIRO's Bribie Island Research Centre (Woorim) before moving to Townsville in 2012 to undertake his PhD in fish physiology at James Cook University. The focus of Geoff's research is investigating hypoxia tolerance in genetically distinct populations of a tropical Australian fish (barramundi).

Extreme temperatures and hypoxic events associated with altered freshwater flow have been implicated in large-scale fish mortality in northern Australia. Among the fish species affected is the barramundi (*Lates calcarifer*). Barramundi are important to tropical ecosystems as a higher-order carnivore and also to recreational and commercial fisheries and aquaculture in the Indo-Pacific region. The first component of Geoffrey's project is investigating the hypoxia tolerance of five different populations of Australian barramundi. After establishing the ability of this fish to respond to hypoxia and the response in different populations, he will then investigate the plasticity of this response following pre-acclimation to hypoxic conditions and the physiological mechanisms associated. Specifically Geoff will investigate oxygen binding and transport in the blood. He will then use genetic tools to establish the molecular basis for hypoxia tolerance in this fish.

Geoff's research will address knowledge gaps in understanding the response of tropical fishes to hypoxic and thermal stress at both the individual and population level. Outcomes will include an understanding of the capacity for barramundi to respond to a changing environment in the short-term through phenotypic plasticity and acclimation, and over longer time frames through local adaptation.



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## AIMS@JCU News

- Congratulations to AIMS@JCU student members Thomas Camus, Darren Coker, Sarah Castine and Yui Sato who have now graduated.
- The deadline for the AIMS@JCU Pilot Research Awards has now passed, best of luck to those who have applied.
- Travel awards are likely to be advertised for AIMS@JCU student members who wish to travel to the AMSA Jubilee conference, 7-11 July 2013 for more information about the conference please visit: <http://www.amsaconference.com.au/>
- Thank you so much to Joe Baker for yet again sponsoring some of our students with a free year's AMSA membership. The lucky recipients this year are: Clair Stark, Patrick Buerger, Kate Quigley, Martino Malerba, Amin R Mohamed Esmail, Kristen Anderson, Kathryn Berry and Eric Fisher. For more information regarding AMSA, please visit: <http://amsa.asn.au/>
- Please 'like' our facebook page to keep up-to-date with AIMS@JCU events and funding opportunities: <https://www.facebook.com/AIMSatJCU>
- To all AIMS staff – don't forget about the day-permits now available for parking on JCU campus – you can no longer use parking hassles as an excuse to stay away from visiting your JCU colleagues! You can pick up an AIMS@JCU funded permit from AIMS reception, Di Bailey (Marine and Tropical Biology building), Helen Collingwood (Science and Engineering faculty building), or the AIMS@JCU office. Or – if its more convenient, you can go and buy your own from the JCU bookshop for only \$2.
- Don't forget to check out the fortnightly Graduate Research School newsletters for funding opportunities and other news: [http://www.jcu.edu.au/grs/JCU\\_116582.html](http://www.jcu.edu.au/grs/JCU_116582.html)
- Jamie Oliver is the Research Director at AIMS and the new AIMS representative of the AIMS@JCU Scientific Advisory Committee. He takes over from Peter Doherty who we thank for his time and work for AIMS@JCU.

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## Jamie Oliver Biography



Jamie has had a long association with coral reef research in Townsville. He undertook undergraduate and graduate studies at James Cook University from 1975 until 1983, completing an Honours degree and a PhD in coral growth and reproduction. He was one of the group of young researchers who jointly documented mass coral spawning on the Great Barrier Reef, a discovery that was awarded a Eureka Prize in 1992. Jamie continued working at JCU for several years as a research officer/

fellow on the management of coral collecting and on remote sensing of coral spawning until taking a post-doctoral fellowship at AIMS to study coral spawning on high latitude reefs around Lord Howe Island. In 1991 Jamie moved into coral reef management at GBRMPA where he worked as the Monitoring Coordinator and ultimately the Director of Research and Information Support. During this time he took a year off to work at AIMS on the Long-Term Monitoring program where he edited the first LTMP report for the GBR. On returning to AIMS he conceived and oversaw the development of the first State of the Great Barrier Reef World Heritage Area report.

After 26 years in Townsville Jamie shifted focus to address issues of food security and poverty alleviation, taking up a position with the WorldFish Center in Penang, Malaysia. There he was responsible for the expansion of a global coral reef information system, ReefBase, and played a major role in the International Coral Reef Action Network as chair of the Steering Committee. After nine years overseas Jamie was looking for new opportunities and was invited back to Australia to head up the Western Australian office of the Australian Institute of Marine Science where he immediately got caught up in the response to the major spill from the Montara oil well off NW Australia. Despite the attractions of Perth and a renovated cottage in Fremantle, Jamie finally "closed the circle" and returned back to Townsville in 2013 as the new Research Director. One of his roles is to represent AIMS on the AIMS@JCU Scientific Advisory Committee.

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## Research Director Report

Congratulations and welcome to the 2013 cohort of AIMS@JCU scholarship students: Catalina Hurtado, Christine Altenrath and Patrick Burger and Geoffrey Collins. I would also like to welcome all other new staff, student and associate members of AIMS@JCU. And – hearty congratulations to those who have recently graduated with their PhD's – Drs Thomas Camus, Sarah Castine, Darren Coker and Yui Sato. We would love to stay in touch with you – and hope you will take up alumni membership if you are leaving town. Our AIMS@JCU family has now grown to 163 members including 67 student members (JCU students with a supervisor at AIMS), and membership is a great way of staying connected.

We have been exploring ways to strengthen quantitative marine science skills amongst our student members. The first significant initiative is a biostatistics course using R, delivered by Dr Murray Logan (AIMS) in intensive block mode over two weeks in May and June, plus online tutorials. There has been a fantastic response to this opportunity from you, and we hope to be able to offer this course again in the future.

With seminar day now set for 21 June, we hope all student members are planning their presentations and the chance to showcase not just their science, but their skills in explaining it to an audience – while at the same time being in the running to win funding awards to be spent on more science communication. Six student members have taken up the opportunity to represent AIMS@JCU at the upcoming AMSA golden jubilee conference, and have been awarded a \$500 travel grant to assist with the cost. The AIMS@JCU seminar day will be a great practice ground for these presentations.

And further on the subject of science communication - watch out for emails from Line Bay, seeking entrants in the 2013 AIMS@JCU heat of the 'my research in 3 minutes' competition. We will again support this event with great prizes, and preparatory workshops to assist in the new and growing communication genre – the speed talk.

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