



NEWS

International parasitology retreat at Kioloa



Taking a break watching the waves break. Lunch during the Dreamtime/Bush Tucker walk at the International Research Training Group retreat at Kioloa. Image Alex Maier.

This October, students and faculty members from the International Research Training Group ‘Crossing Boundaries: Molecular Interactions in Malaria’ (IRTG2290) congregated on the Kioloa Coastal Campus for the program’s annual retreat. Researchers from Humboldt University in Berlin and ANU joined for a week of scientific discussion, collaboration and fun. The IRTG2290 students will spend part of their PhD at each other’s university, graduating with a dual award PhD. This meeting was the first opportunity that the Australian and German students had to get to know each other and discuss their work on malaria, laying the basis for collaboration throughout their projects. Each student presented their project outline and progress to an audience of expert academics in the field. Faculty members also had the opportunity to present on their research group’s focus, and place the projects in the context of the wider field of malaria research. The week’s program was complemented with scientific workshops with a focus on best practice research for academic publishing. This included sessions on reproducible research presented by **Benjamin Schwessinger** (PS), publishing from an editor’s perspective by **Kevin Saliba** (BSB), image credibility with **Sabrina Caldwell** (CECS), science communication with **James Walsh** (JCOS) and scientific illustration with **Erin Walsh** (CHM). There were also opportunities to go beyond the scientific world, with a full day workshop on Indigenous culture and history, led by **Noel Butler**, a local elder of the Budawang people. Members of the ANU Parasitology group also joined in on the fun, dropping in to meet the visitors



Rob Sharwood demonstrating transpiration of a local tree in Timor Leste to local science teachers. He placed a plastic bag over the leaf so that water vapour from leaf transpiration condenses in the sealed plastic bag. This was to demonstrate to the teachers a simple practical to illustrate photosynthesis and role of water movement through the plant and the importance of cooling of leaves through evapotranspiration. (See: News Item).

and participate in elements of the program. Everyone enjoyed the week, and it was a great opportunity to strengthen the international connection for training young parasitologists, which will continue for the life of the program and beyond. - **Merryn Fraser** (Maier group, BSB) and **Francois Korbmacher** (Humboldt University in Berlin).

Teaching the teachers in Timor-Leste

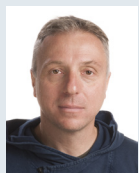


David Johns (Canberra Islamic School principal), Robert Sharwood (Furbank group, PS), Maliana teacher, AJ Mitchell (RSPE) and Carly Conlan after receiving a gift of Tais from the Fundação SCJ Diocese Maliana as a thankyou for running the workshops. Tais cloth is a form of traditional weaving created by the women of East Timor.

For the third year running, Rob Sharwood and a small team from ANU and Canberra schools went to Timor-Leste to run teaching workshops for local science teachers. On September 30, Robert Sharwood (RSB), AJ Mitchell (RSPE), David Johns (principal of Canberra Islamic School) and Carly Conlan (science teacher, Burgmann Anglican College) flew into Dili, the capital of Timor-Leste, where we were picked up by the Fundação SCJ Diocese de Maliana

and transported to Maliana, which is 4 hours drive from Dili. The next day we made our way to Suai for our first two day intensive masterclass on teaching science in high schools. The place for class was originally a church but was a site of a catastrophic event during occupation where we learned that 300 people including 3 priests were gunned down by militia and the church set alight. This was the backdrop to our first masterclass. Extremely sad and the memorial will live with me forever. Overall, our goals have been to ensure teachers are equipped with methods/tools to help with classroom management, lesson planning, practical experiments to reinforce fundamental scientific concepts and critical independent thinking. We started off with a simple experiment, using measuring cylinders to determine the volume of water a bucket could hold. To our surprise, 5 minutes in we found that the majority of teachers could not use a measuring cylinder. This really affirmed our belief that rote learning is not a sufficient way to teach content and that the science teachers needed exposure to many experiments to teach fundamental concepts. The purpose of measuring the volume of the bucket was to reinforce the importance of precise and accurate measurements. We then wrote up the scientific method that all scientists follow (Introduction, Aims, Methods, Results, Discussion and Conclusions).

Profile: Marcin Adamski, RSB bioinformatician.



Research background.

Marcin was born and raised in Poland. Influenced by Sir David Attenborough films, in primary school he wanted to become a biologist.

But finding machines to be more predictable, he decided to study electronics in high school and computing at the university, obtaining Master of Science in Engineering in Computer Programming. Yet, he quickly realised that dissections of computational theorems don't interest him as much as actual application of computational techniques to "real life" problems. So, he got his PhD in Hydro-Geo-Chemistry (yes, really) working on computational modelling of ion transport and chemical interactions in limestone-like rock structure. After that, the only logical step was to start a postdoctoral position in Bioinformatics Program at Human Genetics Department, University of Michigan to work on MS/MS proteomics of human plasma. That was followed by a switch to genomics of non-model species to work on the first sponge genome project at The University of Queensland. To his own surprise, Marcin continued to work in sponge genomics at the Sars International Centre for Marine Molecular Biology in Norway.

Research interests.

Marcin has research ADHD: as long as it's computational, it interests him. He promised himself to limit his involvements to bioinformatics. He is particularly interested in genomics – genome assemblies and annotations and molecular phylogeny – especially in trying to figure out what on Earth has happened at the origin of multicellular animals, making it so hard to pinpoint the oldest animal lineage.

Marcin (currently) declares himself as professional bioinformatician. It means that he is always ready to attempt to solve (or die trying) any bioinformatics problem. If you have something to throw at him, you can always drop him an email or just come to his office in the EBL space in RN Robertson on his 'office day' – Wednesday.

Teaching Philosophy:

Marcin considers teaching to be an interactive activity, where the teacher's role is that of a guide through the learning process, rather than source of knowledge. Marcin is a lecturer in the Quantitative Biology Course BIOL2001. Together with Teresa Neeman from SCU he also organizes and teaches Bioinformatics Workshops, running twice a year for all students and staff from RSB, JCSMR and The Fenner School.

Science hero:

Short answer: A brain child of Sir David Attenborough and Bjarne Stroustrup.

We had a translator to convert our text to Tetun which really helped with this two day course. At this masterclass we had 26 teachers including some from the public system. One biology teacher had never seen a stomate, so I ran to the markets to buy some tape and nail polish and with battery powered microscopes I was able to show him stomata on the underside of a common tree growing in the area, for the first time. For me this was priceless. We were very fortunate to be able to utilize Alisha Duncan's experiments to teach further aspects of photosynthesis such as the leaf disc floating experiment. This is where you place leave discs in a solution of water, detergent and sodium bicarbonate and infiltrate it into the leaf airspaces. The discs sink and then by placing them in the sunlight photosynthesis occurs and the release of oxygen forces liquid out of the airspaces and the disc floats. This is a wonderful experiment and the teachers were going to use it to show their governing body of education to demonstrate effective methods of teaching. We were fortunate to have David Johns, who is an expert on teaching pedagogy and classroom management, who I learn from each year, so effectively I am getting training as well. With his 30 years of teaching experience (he taught me biology) the masterclass is so valuable for the teachers. With AJ and Carly we got to present new physics and chemistry pracs, respectively. The teachers really enjoyed learning ways to teach gravity and measure pH. After Suai, we left for our 4 hour trip back across the mountains to Maliana. The roads in some areas were down to only one lane with no safety rails, so this was an elite 4WD driving course. New roads are currently being constructed through the help of loans and construction machinery from the Chinese government and this will really help trade and travel. We arrived back in Maliana and set up for our Thursday and Friday masterclass for schools close to Maliana and teaching students from university in Dili. We felt straight away the teachers in Maliana were at a different teaching level so we provided plenty of new experiments, from catapults, leaf transpiration, pH of different solutions, electrical circuits using a lemon, electrolysis to split water using nails and a 9V battery, temperature measurements, leaf disc floating, stomatal imaging with counting numbers of open and closed stomata, plants in artificial environments and the importance of soil. The teachers again explored the scientific method and we chose a teacher to write an

experimental report on photosynthesis on photosynthesis in Tetun on the whiteboard and explain it to his colleagues.

We are particularly excited to go back in 2019 with our program and to extend into areas of agriculture to help farmers choose appropriate crops for their soil. But this latter venture will require new funding and we hope to approach other providers in the future.

Our main goal in the future is to ensure sustainability of our program and to ensure the best teachers are mentors to their junior staff. Hopefully we can equip them with new materials and experiments to improve science teaching.

We gratefully acknowledge the support from **Allen Rodrigo** (RSB), **Robert Furbank** (ARC CoeTP) and the Research School of Physics. - **Rob Sharwood**, (Furbank group, PS).

RN Robertson building an underrated gem

The RN Robertson building was named as one of five locations on campus with heritage significance, by **Amy Jarvis**, the ANU Heritage Advisor. She said the building, dating back to 1972, was "an underrated gem, the brutalist exterior often goes unnoticed, but the amazing atrium space on the interior is truly something to behold."

Congratulations

Xuankun Li (Rowell group, E&E) was awarded the Phil Carne Prize at the 2018 Australian Entomological Society conference, held in Alice Springs. The annual award aims to foster high quality entomological research in young scientists and was last won by an ANU student in 1988.

With over 700 participants, the 2018 ComBio was an exciting event packed into 3 days at the Sydney Convention Centre. At the closing ceremony, **Annamaria De Rosa** (Evans group, PS) was awarded one of the Poster Prizes from the Australian Society



Annamaria De Rosa receiving the poster award from the president of ASPS, Sergey Shabala.

of Plant Scientists (ASPS) for her work on 'Characterisation of tobacco aquaporins: the search for CO₂ pores'. Earlier in the conference, **Caitlyn Byrt** (PS) gave a lecture on 'Cell membrane water channels with built in ion

channels' on receiving the Peter Goldacre medal. - **John Evans**, PS.

Alex Skeels (Cardillo group, E&E) has been awarded a Society of Systematic Biologists Graduate Student Research Award to the

value of \$2000. The award will support his work on models of diversification and biogeography.

IN THE MEDIA

A paper published by **Rosie O'Dea**, **Mike Jennions** (E&E) and colleagues showing that girls and boys perform very similarly in STEM, has been covered widely in Australia and beyond. Stories ran in the Sydney Morning Herald, ABC online, The Conversation, NBC News in the USA, El Pais and other international media, Cosmos, Royal Society Te Apārangi, the ABC radio AM program, and other outlets. It was also tweeted 666 times. Rosie is a former RSB Honours student, now working on her PhD at UNSW.

Bob Furbank (PS) was interviewed for the GRDC Groundcover publication.

Rob Sharwood (Furbank group, PS) was interviewed for an article in the Spring 2018 Cosmos magazine, which explores how molecular biology and an old Soviet seed bank may hold the key to future food production. Research by **Rob Sharwood**, **Florian Busch** (Farquhar group, PS) and colleagues on increasing the productivity of corn, published in Nature Plants, was picked up by media including Cosmos, phys.org, and SeedQuest.

Scott Keogh (E&E) and **Robert Sharwood** (Furbank group, PS) were named as leaders in the fields of zoology and botany respectively in the new edition of The Australian's Research magazine. The report also names ANU as the leading Australian institution in the fields of evolutionary biology, and plant pathology.

WELCOME

Yun Hsiao is the new PhD student in the



Rowell group (E&E) with joint supervision under the Australian National Insect Collection, CSIRO.

Yun comes from Taiwan

and completed his Bachelor degree of Entomology from National Taiwan University in early 2017. Over the past 5 years, he has been well trained in insect taxonomy, comparative morphology and working on beetles. He has published over 30 taxonomic papers, encompassing fossil records and extant species, including five papers after joining the ANU, which were his continued works in Taiwan. Yun will work on the systematics and evolutionary biology of the Australian cycad associated beetles as his PhD project based at the CSIRO.



The Centre for Entrepreneurial Agri-technology (CEAT) welcomes **Ursula Cringle**, their new Administration Officer. Ursula has a background in HR.

NEW APPOINTMENTS

Alisha Duncan has taken an eight-month secondment with the new Centre for Entrepreneurial Agri-Technology (CEAT), as their Events and Industry Engagement Officer. She will be running workshops, forums and liaising with industry and farmers to connect new tech to the right pathway to impact. Alisha was formerly the Education Officer at the Centre of Excellence for Translational Photosynthesis.

FAREWELL

Suresh Yerasu Reddy is returning to India after completing a nine-month Indo-Australian Career Boosting Gold Fellowship in the Jones group (PS) working on CRSIPR/Cas9-mediated genome editing in tomato. He will use this technique to knock out genes for late-blight susceptibility among Indian tomato cultivars.

Louis Ranjard (Rodrigo group, CBBU) left RSB this month to return to Auckland, New Zealand, where he will be working for applied bioinformatics company Biomatters.

PHDS SUBMITTED

Sabrina Chin (Mathesius group, PS) 'The role of flavonoids in the interaction between *Medicago truncatula* and *Meloidogyne javanica*'.

Oliver Mead (Solomon group, PS) 'Dissecting molecular mechanisms of disease in the wheat pathogen, *Parastagonospora nodorum*'.

PHDS AWARDED

Meredith Cosgrove (Crisp Group, E&E) 'A wide Brownian land: drought adaptation and niche diversification in an Australian conifer'.

Adelaide Dennis (Kirk group, BSB) 'PfATP4 and the biochemical signature of PfATP4-associated compounds'.

Robyn Shaw (Peakall group E&E) 'The genetic consequences of demography and disturbance in small mammal populations'.

Jared Streich (Borevitz group, PS) 'Genetic, geographic, and climate diversity of a weedy species: the *Brachypodium distachyon* species complex'

PAPERS ACCEPTED

Arnold PA, Levin SC, Stevanovic AL, Johnson KN, Drosophila melanogaster infected with Wolbachia strain wMelCS prefer cooler temperatures, *Ecological Entomology*.

Cardillo M, McAlister W, Dinnage R, The relationship between environmental niche breadth and geographic range size across plant species, *Journal of Biogeography*.

Chin S, Behm CA, Mathesius U, Functions of flavonoids in plant-nematode interactions, *Plants*.

Cranston PS, Kribiodorum Kieffer (= Stelechomyia Reiss) (Diptera: Chironomidae) extends into the Oriental region: three new species and expanded diagnoses, *Zootaxa*.

Evans JR, Clarke TC, The nitrogen cost of photosynthesis, *Journal of Experimental Botany*.

Fikáček M, Liang W-R, Hsiao Y, et al, Biology and morphology of immature stages of banana-associated *Protosternum* beetles, with comments on the status of Taiwanese endemic *P. abnormale* (Coleoptera: Hydrophilidae), *Zoologischer Anzeiger*.

van Lier JR, Wilson SK, Depczynski M, Wenger LN, Fulton CJ, Habitat connectivity and complexity underpin fish community structure across a seascape of tropical macroalgae meadows, *Landscape Ecology*.

Medina, I, Langmore NE, Host density predicts the probability of parasitism by avian brood parasites, *Philosophical Transactions B*.

Nottingham AT, Bååth E, Reischke S, Salinas N, Meir P, Adaptation of soil microbial growth to temperature: using a tropical elevation gradient to predict future changes, *Global Change Biology*.

O'Dea RE, Lagisz M, Jennions MD, Nakagawa S, Gender differences in individual variation in academic grades fail to fit expected patterns for STEM, *Nature Communications*.

O'Leary BM, Asao S, Millar AH, Atkin, OK, Core principles which explain variation in respiration across biological scales, *New Phytologist*.