Big Questions in Biology - Inaugural RSB Public Forum

Australian biodiversity, its past, present and future was the theme of the first in a series of RSB public forums tackling ‘Big Questions in Biology’, held in the Robertson Lecture Theatre this month. Four speakers, Marcel Cardillo (EE), Craig Moritz (EE), Carsten Külheim (Foley and Crisp groups, EE), and Adrienne Nicotra (EE) gave a short presentation about their research, and this was followed by a panel discussion moderated by Rod Lamberts, Deputy Director of the Centre for Public Awareness of Science (CPAS).

Around 140 people, most of whom were not from the RSB, attended the session, which was followed by refreshments.

The forum was organised by Stefan Bröer (BSB), with assistance from Katharine Pierce (SCAPA), Mel Norris and Terri Richardson. Other helping hands included Shannon van Sebille, Christine Larsen, Jenny Rath, Stephen Fairweather (Bröer group, BSB), Emily Rodrigo, Louis Ranjard (Rodrigo group, CBBU), Thomas Wong (Rodrigo group, CBBU) and Jeremy Weinman.

If you were unable to attend but would like to catch up with the discussion, you can listen to the podcast.

Book launch
RSB celebrated the publication of Lindell Bromham’s (EE) second textbook on molecular evolution and phylogenetics this month. According to Lindell, the aim of this book is to provide a non-threatening (equation-free) description of the methods used. With lots of colour photos and diagrams, the book has an easy conversational style, and contains lots of recent examples from the scientific literature, including a wealth of Australian biodiversity. The launch was attended by academics from many disciplinary areas across campus and from CSIRO, as well as a cabal of enthusiastic children who helped to launch the book onto the turtle pond.

Lindell Bromham launches her new book into the turtle pond in the Banks Courtyard, with the help of a group of enthusiastic children (Image: Sharyn Wragg).

CGMB Opening

The new ANU-CSIRO Centre for Genomics, Metabolomics and Bioinformatics (CGMB) was officially opened at the end of last month. ANU Vice Chancellor Brian Schmidt and CSIRO Chief Executive Larry Marshall cut the red ribbon and then toured the Ecogenomics and Bioinformatics Lab (EBL), in the RN Robertson Building, and the Mass Spectrometry Facility in the Research School of Chemistry.

EBL Manager Niccy Aitken (Moritz group, EE), CSIRO Chief Executive Larry Marshall and ANU Vice Chancellor Brian Schmidt during the tour of the EBL. (Image: Stuart Hay).

The CGMB is located at various sites on the ANU campus and the neighbouring CSIRO Black Mountain facility, and will make use of the National Computational Infrastructure (NCI). It receives funding from the federal government Science and Industry Endowment Fund (SIEF). Director of the CGMB, Eric Stone (CBBU), said "We are looking to foster advances essential to food security and environmental stewardship in the face of climate change, population growth and land degradation." More information and pictures here.

Science in ACTion

Biology at ANU was represented by three groups at the annual two-day Science in ACTion event at the Old Bus Depot in...
Group leader profile: Rob Lanfear (EE)

Group research focus
My group focusses on three areas united by an interest in understanding molecular evolution. Our longest standing projects focus on understanding why some lineages evolve faster than others. We focus on speciose clades of organisms like birds, flowering plants, and more recently (with a very slightly narrower focus) eucalypts and acacias. We also look to extend and develop our understanding of the theory in this area, so that we can make and test quantitative predictions. Our second area of research was motivated by some of the challenges of measuring rates of molecular evolution, and involves developing new methods in phylogenetics. This work involves efforts to build and select better models of molecular evolution, and has recently grown into pushing some of the boundaries of phylogenetic inference. Finally, we study the accumulation of somatic mutations within individual plants. For this, we leverage the latest sequencing and inference methods to try and catch mutations right at their source, so that we can test hypotheses about the causes and consequences of somatic mutation.

Teaching and research achievements
I hope that our current work on somatic mutations will be our biggest contribution so far - this is an area in which I think we are really improving our ability to measure and understand a critical aspect of biology. I’m also loving the challenge of running a course (I teach the Biology, Society, and Ethics third year course), but my teaching achievements are limited to surviving my first half of a semester of real teaching - I’ve been lucky to be a pure researcher until now.

What do you enjoy most about teaching?
The thing I enjoy the most about teaching is that it makes learning new things a key part of my job. Teaching a bioethics course also means that I get to expose students to a huge variety of challenging and unsolved societal and ethical issues. Invariably, my teaching also influences my research directions, which helps keep a broad range of projects going in my group.

What else do you have underway?
I’ve just started a collaboration here at ANU to use artificial intelligence to try and solve some open problems in phylogenetics. This may or may not work, but it’s great fun and allows me to polish up of the now-ancient techniques I learned during my masters in Artificial Intelligence, before I got hooked on biology.

Kingston. RSB parasitologists manned the Australian Society for Parasitology booth (see main photo), and the Centres of Excellence for Plant Energy Biology and Translational Photosynthesis were also there. Activities on the three stands included DNA extraction, 3D goggles and computer modelling, parasite matching and microscopy, face painting that represented different parasites, infra-red cameras, ‘Lollecule’ making, photosynthesis displays and much more.

Science meets street art
Street art representing the research and discoveries of local young scientists was painted on a wall next to the Kingston bus depot, during Science Week. Daniela Perez (Backwell group, EE), Damien Esquerre (Keogh group, EE) and Dominique Potvin (Magrath group, EE) were part of the group selected to collaborate one-on-one with a street artist, to produce an artwork that represented their research. More pictures and information here.

Plant Functional Diversity field trip to Kioloa
Early this month, Marilyn Ball (PS) took 21 students from her Plant Functional Diversity course to the ANU Kioloa Campus for the weekend. Mike Crisp (EE) and Alexander Schmidt-Lebuhn (CSIRO) gave impromptu lectures about particular plant species and families as the class explored the wet sclerophyll forest on the site. On Saturday night, students prepared and gave presentations on the identification of various plant groups and then competed in a plant-based quiz, which was narrowly won by ‘The Fiddleheads’, who were all awarded 3D postcards of the Kioloa region.

- Dave Rowell (BTLC and EE).
Andrew Cockburn (EE) has been elected to be the next President of the International Society for Behavioural Ecology, and will serve from 2018-2020.

Grants
Peter Solomon (PS) has been awarded $50,000 through the ANU Discovery Translation Fund 2.0, to work on novel bio-herbicides with Biotelliga Ltd, in New Zealand.

Russell Dinnage (Cardillo group, EE), Marcel Cardillo (EE) & Gavin Huttley (EE, CBBU), together with Owain Edwards from CSIRO, have been awarded a CBA Ignition Grant: ‘Characterizing the evolutionary and ecological diversity of invertebrates in the monsoonal vine thickets of the Kimberley’.

IN THE MEDIA
A PNAS paper led by Kai Xin Chan (Pogson group, PS) and Barry Pogson (PS) in collaboration with Peter Mabbitt and Colin Jackson (RSC) on a biochemical mechanism for oxidative stress sensing in chloroplasts during drought stress, which could lead to the development of drought-proof crops, was reported in the Canberra Times.

Maria Hoefer Anke EE) and former RSB HDR student authored by Dan Starrs (Divisional Visitor, Science Show, produced by Canberra’s 500,000 people. Their work was featured in various online articles including ABC National Radio, and SBS Radio; as well in interviews on Win Network News, ABC.

Victor Tagliacollo is a new postdoc in the Lanfear group (EE) who will be working on phylogenetic methods. He’s here for six months on an Endeavour fellowship.

Oliver Binks will join the Meir group (PS) in September as a postdoc. He has worked on the responses to drought by Amazonian rainforest, focussing on foliar responses to water stress. He will extend this research in Australia, and he began testing new ideas in the Daintree rainforest (N. Queensland) this month on a Stable Isotopes in Biosphere Systems course with some RSB colleagues. Oliver received his PhD from the University of Edinburgh UK, and his BSc from Aberdeen University, UK. He arrives with his young family.

PHDS SUBMITTED

PAPERS ACCEPTED


Callaby, R, Toye, P, Jennings, A ...Kruuk, LEB, Relative cost of offspring sex and offspring survival in a polygynous mammal, Biology Letters.


O’Sullivan, OS, Haskel, MA, Reich, PB, ...Zhu, L, Egerton, JG, Bloomfield, KJ, ...Abdul Bahar, N, ...Meir, P, Turnbull, MH, Atkin, OK, Increasing severity of heat-waves and the risk to leaf metabolism across biomes, Global Change Biology.


NOTICES
The University has requested that all areas complete a stocktake of their chemical holdings, partly to validate the CMS entries and partly to assess the scope of re-labelling needed under the GHS requirements that begin at the end of the year. The Compliance team is carrying this out with the assistance of Divisional STO teams. To schedule your area, contact compliance.rsb@anu.edu.au.