

# **Australian Museum Research Institute Student Forum 2014**



**12 November 2014  
Australian Museum**

# Schedule

Time	Speaker	Topic
1:00	Dr. Brian Lassig	Welcome
1:15	Phil Sutton	Lapita exchange across the Solomon Sea
1:30	Karen Stokes	Stone sources and social networks in Southeastern Australia
1:45	Laura Holmes	The Matron's Album: Invoking indigenous history through archival sources
2:00	Mariko Smith	Vessels of knowledge, identity and culture in Aboriginal canoe making
2:15	Alexandra Merriles-White	Structure and evolution of the Kulnara Volcanic Centre
2:30	BREAK	
2:45	Kyle Ewart	DNA identification of Rhinoceros horn
3:00	Yanan Sun	Revision of <i>Hydroides</i> (Serpulidae, Annelida) in Australia, with cryptic diversity revealed by molecular data
3:15	Jack O'Connor	Sensory ecology of orientation behaviour in larval Perciform fishes
3:30	Georgia Thomas	Characterisation of factors influencing male reproductive success of grey kangaroos
3:45	Stephanie Thomas	Identification, presence and population status of Kimberley rock wallabies
4:00	Aria Lee	Reproductive strategy and gamete development of the European fanworm

# **Lapita exchange across the Solomon Sea: PXRF sourcing and morphological analysis of obsidian artefacts from Apalo, West New Britain**

**Philip Sutton**

University of Sydney

Supervisor: Robin Torrence



By taking advantage of the practical advantages of Portable X-Ray Fluorescence spectrometry (PXRF), the geological provenance of the obsidian artefact assemblage from Apalo, a coastal site located in the Arawe Islands off West New Britain, has been determined. The increased sample size relative to previous studies has significantly improved the chronological and geographical resolution of obsidian sourcing patterns in the Arawes, including the first identification of material from the Fergusson Islands in the Bismarck Archipelago. Differences in provenance are correlated with subtle trends in the morphological attributes of the assemblage. The study also explores links between the evolution of long-distance lithic exchange networks in Melanesia and major cultural and environmental changes, such as volcanic eruptions and the emergence of the Lapita Cultural Complex.

# Stone sources and social networks: Tracing Dharawal movement and exchange in Southeastern Australia

Karen Stokes

University of Sydney

Supervisor: Val Attenbrow



Historical evidence suggests that at the time of European settlement Dharawal Aboriginal groups had an established regional economy with movement of items (and people) via pathways linking the highlands west of the Illawarra escarpment and the resource-rich coastal plain. But what extent do these patterns of activity reflect pre-colonial practices? Social exchange conducted in a variety of contexts including ceremonial gatherings is known to have played important roles within Aboriginal economic/social systems, with ground edged hatchets and raw

material for their manufacture among the items that moved within them. Archaeological provenancing of 148 ground-edged hatchets from findspots in the Dharawal study region, using non-destructive pXRF analysis to match them to potential local and inter-regional raw material sources, traces the exchange network within which these artefacts, and/or their raw materials moved. Correlation between provenancing results and European observations of movement and gathering of Dharawal people as well as consistency in historical patterns over time, suggests a pre-colonial network connecting Dharawal groups socially and economically that continued to be used throughout the first fifty years of European colonisation.

# The Matron's Album: Invoking indigenous history through archival sources

**Laura Holmes**

Deakin University

Supervisor: Vanessa Finney



This project examines an album of photographs taken between 1930 and 1940 on four Aboriginal Stations in rural NSW and endeavours to discuss a number of themes that the album presents. The album as a whole provides small snippets of information about many individuals living on the various stations, while at the same time showing a larger picture of station life in the early 20<sup>th</sup> century. Themes brought up by the album include the beginning of the Aboriginal rights movement in NSW, the work of anthropologists such as Norman Tindale, the role of Aboriginal bush nurses and Aboriginal servicemen. Similarly, the album invokes issues of the stolen generation, loss of sovereignty and

the continuation of Aboriginal culture against the tide of colonialism. Researching this project involved preliminary desk research using online databases such as Trove, the National Library of Australia's war records and Births, Deaths and Marriages before utilising other libraries and NSW State Records. Some limitations included restrictions on access, "pay walls" and a limited ability to contact members of the Aboriginal communities in question without prior ethics approval through university, which would have been easier to navigate had time permitted.

## **Vessels of knowledge, identity and culture: Exploring Aboriginal tied-bark canoe-making experiences**

**Mariko Smith**

University of Sydney and Australian Museum



It is important for people to learn about objects through the experiences and stories of their creators and communities of origin. This is especially relevant in the museum context. My PhD is about the socio-cultural significance of Aboriginal community tied-bark canoe-making. I consider the canoe to be a vessel of knowledge, identity and culture; and the process of making a canoe as a multi-sensorial learning experience which goes beyond verbal and written communication. As an Aboriginal

researcher, I aim to engage with and represent Aboriginal peoples' canoe-making experiences through photographs, film and interviews using sensory elicitation techniques that are compatible with Indigenous ways of knowing and cultural expression. I will describe a canoe-making I observed and participated in with a NSW South Coast Aboriginal community in August 2014. The tied-bark canoe was commissioned by the Australian Museum for the upcoming "Sea Country" exhibition opening in November 2014. It is an example of how museums and researchers can support and facilitate the continuation of Aboriginal culture through actively engaging with communities, Indigenous knowledges and cultural practices.

# Structure and evolution of the Kulnura volcanic centre, Central Coast NSW

**Alexandra Merrilees-White**

University of New South Wales

Supervisors: Ian Graham and Lin Sutherland



The east coast of Australia was subjected to a voluminous but sporadic volcanism during the Cenozoic, from the Torres Straits in the far north, along the highlands of eastern Australia, then south through Eastern Victoria, South Australia and Tasmania. The exact cause of this passive margin volcanism remains poorly constrained despite extensive studies. Within the Sydney Basin there is an abundance of Mesozoic-Cenozoic volcanic activity mostly seen in small intrusions such as dykes and sills. Previous studies have primarily focused on well-exposed smaller intrusions; with little scientific investigation of larger volcanic centres. Petrographic and geochemical studies of the basalts and entrained xenoliths at Kulnura Quarry will provide evidence of the mantle composition and conditions; while the structure of the volcanic sequence will indicate possible emplacement mechanisms and post-crystallisation deformation events.

# DNA identification of rhinoceros horn

**Kyle Ewart**

University of Sydney and Australian Museum

Supervisor: Rebecca Johnson



Rhinoceros (rhino) numbers have dwindled over the past century. As a result, three of the five species are considered as critically endangered, one species is vulnerable and one species is near threatened. The main threat to rhinos is the poaching of their horns. Poaching has increased dramatically over the past decade due to the growing demand for horn products in Asia. It is vital to improve rhino forensics and anti-poaching enforcement as part of a multi-faceted approach

to control the horn trade. A rapid and robust species identification (ID) test utilizing species-specific primers on the cytochrome-b gene will minimize the time and expense of identifying the species of a seized horn or horn derivative. Developing an improved set of rhino population markers such as tetranucleotide microsatellites and single-nucleotide polymorphism (SNP) markers can enhance individualization and conservation genetic applications.

# Revision of *Hydroides* (Serpulidae, Annelida) in Australia, with cryptic diversity revealed by molecular data

Yanan Sun

Macquarie University and Australian Museum

Supervisor: Elena Kupriyanova



*Hydroides* Gunnerus, 1768 is the largest genus of calcareous tubeworms of the family Serpulidae (Sabellida, Annelida) with more than 100 described species. These sedentary marine animals are found world-wide in the subtidal zone of tropical and subtropical waters. Many *Hydroides* species are important reef-builders, foulers, and biological invaders that can be easily transported as adults attached to ship hulls or in ballast water as larvae. By forming dense aggregations on artificial underwater structures, they

constitute a significant nuisance to marine aquaculture, navigation, shipping industries and power plants. The genus can be distinguished from other tubeworms by the characteristic elaborate two-layer tube plug called the operculum. Nevertheless, species delimitation within *Hydroides* based on morphology is problematic. This study explored phylogenetic relationships of 35 *Hydroides* species from different geographic regions. The results assist marine pest and quarantine authorities to distinguish morphologically similar species and recognize potential *Hydroides* invaders.

## Sensory ecology of orientation behaviour in larval Perciform fishes

**Jack O'Connor**

UTS and Australian Museum

Supervisor: Jeff Leis



Thanks to the work of larval fish ecologists such as Australian Museum Senior Fellow Dr. Jeff Leis, we are discovering that the behaviour of these tiny young fishes may play a larger role in the all important dispersal and recruitment phases of fish populations than previously thought. By studying various life-histories and sensory modalities, my ongoing work examines the sensory behaviour and abilities, such as sun compass, magnetoreception and olfaction, that larval fish may use

to guide their way from the pelagic ocean to settlement habitat.

# Characterisation of factors influencing male reproductive success in the eastern grey kangaroo (*Macropus giganteus*)

**Georgia Thomas**

University of Sydney

Supervisor: Mark Eldridge



My project aimed to identify factors influencing male reproductive success in a free living population of eastern grey kangaroos (*Macropus giganteus*). Natural selection pressures select for various traits that enhance a male's ability to produce more offspring. My project investigated body weight, skeletal size, testes size and/or testosterone and glucocorticoid concentrations and their relationship with reproductive success. The results assist the development and continuation of evolutionary theories surrounding marsupials, as well as provide valuable information regarding the management of wild and captive populations.

# Reproductive strategy and gamete development of the European fanworm (*Sabella spallanzanii*) in Gulf St Vincent, South Australia

Aria Lee

University of New South Wales

Supervisor: Pat Hutchings



Invasive species can cause serious impacts to the ecology and economy of novel regions. Their successful establishment and dispersal has been linked to many factors including reproductive strategies such as early maturity, high reproductive capacity and flexibility in reproductive schedules. Understanding the capacity for these reproductive strategies to facilitate successful invasion could

therefore provide crucial insight for managers seeking to design eradication programs. This is especially important in marine environments as species that reproduce by broadcast spawning have a high capacity to widely disperse gametes and larvae. We investigated the reproductive strategies of the invasive Mediterranean fanworm, *Sabella spallanzanii* in populations at North Haven and Wirrina Cove in Gulf St Vincent, South Australia. Our findings about the local spawning periodicity and size at reproductive maturity will be crucial for determining the optimum timing of control efforts for *S. spallanzanii* in South Australia.