

Monday 15 – Tuesday 16 July, 2019

Overview

This free 2-day workshop will provide an introduction to phylogenetic analysis, including practical exercises based on the software *MEGA* and *BEAST 2*. It is primarily aimed at research students and postdoctoral researchers, but other prospective attendees are welcome. Prior knowledge of basic phylogenetics is helpful but not strictly essential.

The workshop will comprise a series of lectures and practical exercises. The first day will cover interpreting phylogenetic trees, molecular data, sequence alignment, evolutionary models, and phylogenetic methods. The second day will provide an introduction to Bayesian phylogenetic analysis and will include models and priors, molecular clocks, and estimating timescales.

Instructors

The workshop will be led by Simon Ho (University of Sydney) and David Duchêne (Australian National University). The instructors will comprise members of the **Molecular Ecology, Evolution, and Phylogenetics Laboratory** at the University of Sydney, including Nate Lo, Cara Van Der Wal, Perry Beasley-Hall, and Kai Tea, with assistance from Sam Traves.

Venue

The workshop will be held in the Abercrombie Building at the University of Sydney. This building is a short walk from Redfern Station and is on the corner of Abercombe St and Codrington St. If you are travelling from outside Sydney, please organise your own accommodation (suggestions are provided below).

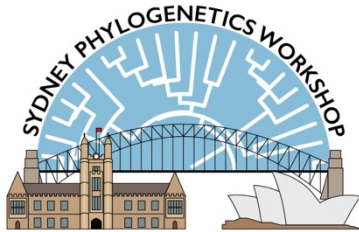
Tea, coffee, biscuits, and fruit will be available during the workshop. Please bring a reuseable cup if you have one. Lunch will not be provided, but we offer some recommendations for nearby food outlets below.

Computing

The practical exercises will involve basic analyses of prepared data sets. You will need to bring your own laptop. Please download and install *MEGA* (version 6 or higher), *BEAST 2* (version 2.4.8 or higher), *Tracer*, and *FigTree* prior to the workshop. Free wifi access will be available.

Registration

The workshop is free to attend, but there will be a limit of 40 participants. To express your interest in attending the workshop, please contact Simon Ho (simon.ho@sydney.edu.au). If we are unable to offer places to everyone, we will give priority to research students.



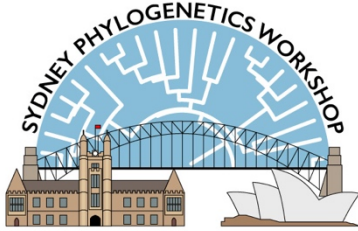
Workshop Programme

Monday 15 July: Introduction to phylogenetic analysis

09.15 – 09.30	Arrival and set-up	
09.30 – 09.40	Welcome	Simon Ho
09.40 – 10.30	Lecture 1.1: Introduction to molecular phylogenetics	Nate Lo
10.30 – 11.00	Practical 1a: Sequence alignment in <i>MEGA</i>	Nate Lo
	--- Break ---	
11.15 – 12.00	Lecture 1.2: Evolutionary models	David Duchêne
12.00 – 12.30	Lecture 1.3: Phylogenetic data	Cara Van Der Wal
	--- Lunch break ---	
13.15 – 14.00	Lecture 1.4: Phylogenetic methods	Simon Ho
14.00 – 17.00	Practical 1b: Model selection and phylogenetics in <i>MEGA</i>	Cara Van Der Wal & Kai Tea

Tuesday 16 July: Bayesian phylogenetics and molecular dating

09.15 – 09.30	Arrival	
09.30 – 10.30	Lecture 2.1: Bayesian phylogenetic analysis	Simon Ho
10.30 – 11.00	Lecture 2.2: Models and priors	David Duchêne
	--- Break ---	
11.15 – 12.30	Practical 2a: Bayesian analysis using <i>BEAST</i>	David Duchêne
	--- Lunch break ---	
13.15 – 13.45	Lecture 2.3: Molecular dating	Simon Ho
13.45 – 14.15	Lecture 2.4: Calibrating the molecular clock	David Duchêne
14.15 – 14.30	Lecture 2.5: Gene trees	Simon Ho
14.30 – 17.00	Practical 2b: Molecular dating using <i>BEAST</i>	Perry Beasley-Hall



Useful Readings

Reference books

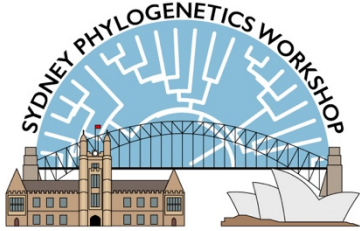
- *An Introduction to Molecular Evolution and Phylogenetics*
Bromham (2016) Oxford University Press.
- *Molecular Evolution: A Statistical Approach*
Yang (2014) Oxford University Press.
- *The Phylogenetic Handbook*
Lemey, Salemi, & Vandamme (2009) Cambridge University Press.
- *Bayesian Phylogenetics: Methods, Algorithms, and Applications*
Chen, Kuo, & Lewis (2014) Chapman & Hall / CRC.

Molecular phylogenetics and Bayesian inference

- *Molecular phylogenetics: principles and practice*
Yang & Rannala (2012) *Nat Rev Genet* 13: 303–314.
- *State-of-the-art methodologies dictate new standards for phylogenetic analysis*
Anisimova et al. (2013) *BMC Evol Biol* 13: 161.
- *Bayesian phylogenetic and phylodynamic data integration using BEAST 1.10*
Suchard et al. (2018) *Virus Evol* 4: vey016.

Molecular dating

- *A practical guide to molecular dating*
Sauquet (2013) *C R Palevol*, 12: 355–367.
- *Bayesian molecular clock dating of species divergences in the genomics era*
dos Reis, Donoghue, & Yang (2016) *Nat Rev Genet* 17: 71–80.
- *Estimating evolutionary timescales using the molecular clock*
Ho & Duchêne (2014) *Mol Ecol* 23: 5947–5965.
- *Bayesian molecular dating: opening up the black box*
Bromham et al. (2018) *Biol Rev* 93: 1165–1191.



Accommodation

The Sydney Phylogenetics Workshop will be held in the Abercrombie Building, University of Sydney. If you are travelling from outside Sydney to attend the workshop, please organise your own accommodation.

The workshop venue is on the corner of Codrington St and Abercrombie St, within short walking distance of Redfern Station. The university has excellent public transport links and is a short bus trip (<30 min) from the City (Sydney, Haymarket, Ultimo, and Pyrmont) or parts of the Inner West (Camperdown, Chippendale, Darlington, Newtown, Glebe, Forest Lodge, Enmore, and Erskineville).

The list below contains a few options for accommodation close to the University of Sydney. All of these have received generally good review scores on Tripadvisor. A range of options can also be found on airbnb (<https://www.airbnb.com.au/>).

>\$200 per night

- Veriu Camperdown (4 stars), 84-86 Parramatta Road, Camperdown NSW 2050
<https://www.veriu.com.au/camperdown/en/>

>\$150 per night

- Rydges Camperdown (3.5 stars), 9 Missenden Road, Camperdown NSW 2050
<https://www.rydges.com/accommodation/sydney-nsw/camperdown/>
- Best Western Haven Glebe (4 stars), 196 Glebe Point Road, Glebe NSW 2037
<https://www.havenhotel.com.au/>
- Verona Guest House (4 stars), 224 Glebe Point Road, Glebe NSW 2037
<http://www.veronaglebe.com/>

~\$150 per night







- Adina Apartment Hotel Sydney Chippendale (4 stars), 74-80 Ivy Street, Darlington NSW 2008
<https://www.adinahotels.com/en/apartments/sydney-chippendale/>
- Ryals Hotel (3 stars), 253 Broadway, Glebe, NSW 2037
<http://www.ryalshotels.com.au/broadway-rooms/>





<\$100 per night

- Alishan International Guest House (3 stars), 100 Glebe Point Rd, Glebe NSW 2037
<https://alishan.com.au/>
- Mad Monkey Broadway Backpackers (2 stars), 20 City Rd, Chippendale NSW 2008
<http://www.madmonkeybroadway.com.au/>
- VLA Glebe Backpackers (2 stars), 256 Glebe Point Rd, Glebe NSW 2037
<http://www.villagelivingaustralia.com.au/properties/vla-glebe>

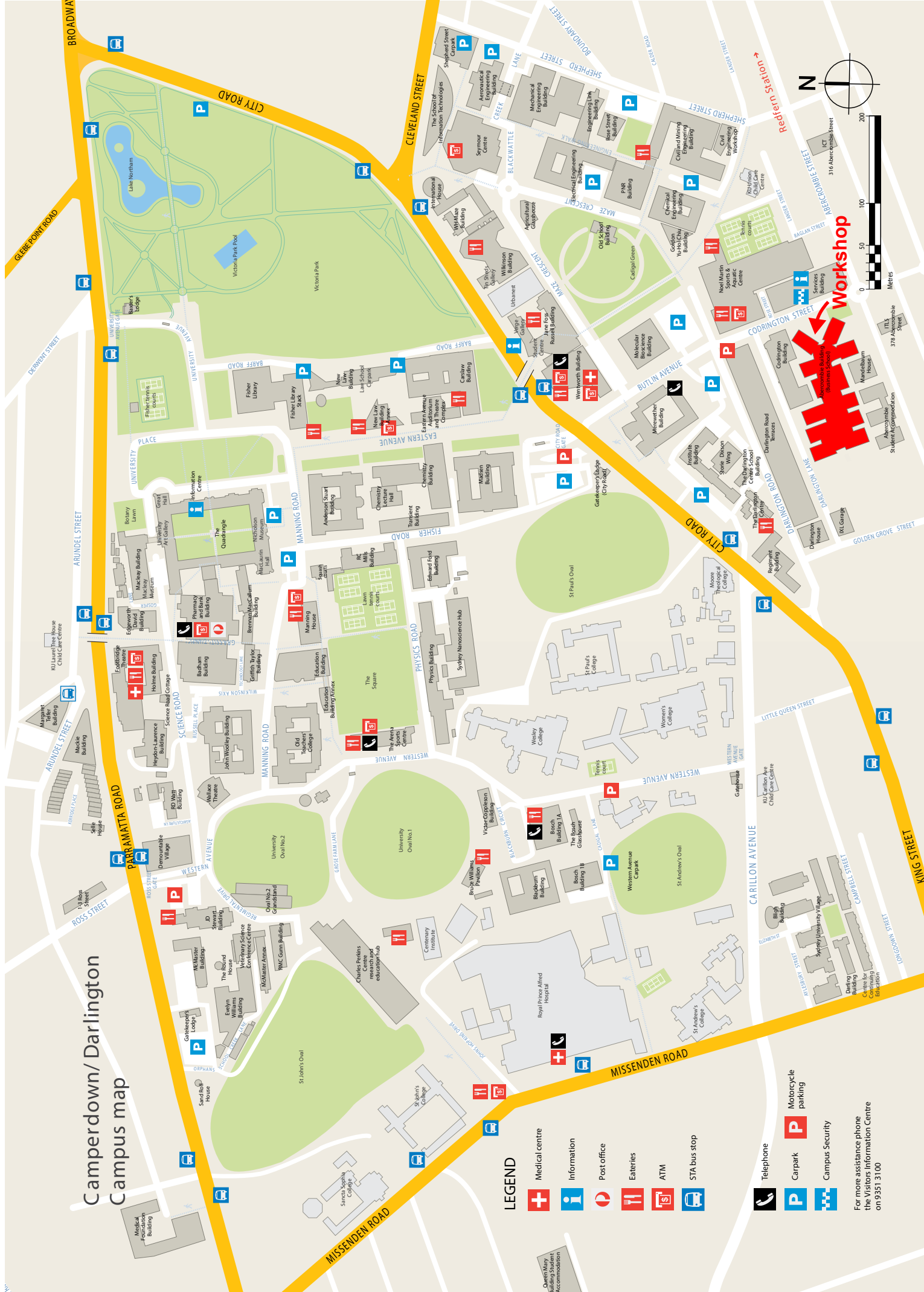
Camperdown/Darlington Campus map

LEGEND

-  Medical centre
-  Information
-  Post office
-  Eateries
-  ATM
-  STA bus stop

-  Telephone
-  Carpark
-  Motorcycle parking
-  Campus Security

For more assistance phone
the Visitors Information Centre
on 9351 3100



Food outlets within 10 min walk

