



## 4<sup>th</sup> Annual Winter School

### *Biogeochemistry of the Earth System*

#### **Welcome**

Thank you for participating in the ARC Centre of Excellence for Climate System Science, 4<sup>th</sup> Annual Winter School.

The 2015 Winter School is a high-level education program for honours and graduate students interested in climate science. It will be of considerable relevance to those working in atmospheric sciences, oceanography and land processes.

We hope that the skills gained from this winter school provide you with an insight into climate science and biogeochemistry, and prove to be an invaluable reference for you future careers.

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# ARC Centre of Excellence for Climate System Science

The ARC Centre of Excellence for Climate System Science (ARCCSS, or sometimes simply referred to as the CoE) is an international research consortium of five Australian universities and a suite of outstanding national and international Partner Organizations. A strategic objective of the ARC Centre of Excellence for Climate System Science is to transform graduate education in climate science at the national scale. This is where our graduate program, led by graduate director, [Melissa Hart](#), comes in. The graduate program reaches beyond a single university and aims to develop the technical and intellectual capacity of Australian graduate students engaged in Climate System Science.

An integral component of our Graduate Program is our annual winter school. The winter schools are highly competitive, week-long, graduate-level courses, and are open to all students regardless of their affiliation with ARCCSS.

This year we are happy to welcome you to our 4<sup>th</sup> annual winter school- Biogeochemistry of the Earth System, held at the Institute for Marine and Antarctic Studies (IMAS) at the University of Tasmania. Please note that the winter school is being run concurrently with a for-credit UTAS unit (QMS512 Biogeochemistry).

## Registration

Registration will commence from 8:30am on Monday June 15th in the University of Tasmania, Institute for Marine and Antarctic Studies (IMAS) lobby.

IMAS - Hobart  
20 Castray Esplanade  
Battery Point TAS 7004  
Telephone: +61 3 6226 6379

## Transport

### Hobart Airport to Travelodge

Transport options to Hotels/ IMAS are listed below.

Please note that a chartered bus has been hired for the return trip to the airport, departing from IMAS at 3pm on Friday (just after the last lab).

### Taxis

A list of local taxi services can be found below. Taxi rides will take approximately 20 minutes.

- Airport Taxi Service Group - 0418 179 202
- Chauffeured Cars & Coaches - 1300 308 000
- Executive Taxi Service - 0411 488 734
- Tascabs Hobart inc Prestige Taxi Service - 0406 106 067
- Taxi Combined Services - 13 2227
- United Taxis - 13 3222
- Yellow Cab Maxi Taxi - 13 6294

### Shuttle Bus – Hobart Airporter

**Cost:** \$18 one-way or \$32 return

The [Redline Airporter](#) bus will take you into Hobart city and drop you at your accommodation. You can also book this airport shuttle bus to pick you up and take you to the airport when you're ready to leave – just make a booking more than two hours before you want to be picked up.

Hours of operation are between 8:30am and 6pm.

[Timetable available here](#)

Phone: 1300 38 55 11

Fax: (03) 6224 7974

Email: [info@airporterhobart.com.au](mailto:info@airporterhobart.com.au)

## Accommodation

### Travelodge - Hobart

Travelodge Hobart is perfectly located in the heart of historic Hobart, close to Franklin Wharf, Battery Point, and many of the city's top attractions.

A short walk will take you to some of the most charming dining locations in the city. Great shopping spots such as Battery Point, Salamanca Place, Constitution Dock and the beauty of the waterfront are also within walking distance.

This hotel is an ideal Hobart base from which to explore all the attractions of the city. Treasures such as the Royal Tasmanian Botanical Gardens, the Tasmanian Museum and Art Gallery, the Museum of Old and New Art, and many more destinations are a short distance away.

### Important information

You will be required to provide a personal credit card per room at check in for any incidental charges.

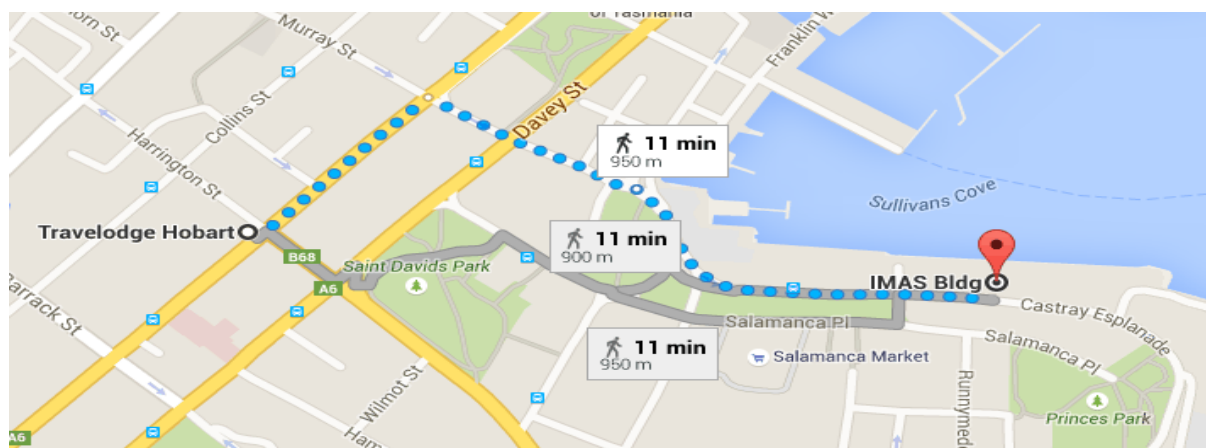
Free Wifi is available for use at Travelodge Hobart. Please ask for login details at reception.

A hot buffet breakfast is included.

167 Macquarie Street Hobart TAS 7000 Australia

Tel: +61 3 6220 7110

<https://www.ifehotels.com/brands/travelodge-hotels/travelodge-hobart>



# Venue

## IMAS

The Institute for Marine and Antarctic Studies (IMAS) was created by the University of Tasmania Council to bring together the many strands of marine and Antarctic research currently being pursued in and around Hobart, to encourage the development of strengthened research links and exploit new research opportunities.

IMAS aspires to be a leading global institution for temperate marine, Southern Ocean and Antarctic research. The new IMAS building, funded by the Commonwealth and on land provided by the Tasmanian Government, will bring together much of Tasmania's considerable strengths in marine and Antarctic studies in one precinct, offering opportunities for collaborative research of state, national and international significance.

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IMAS is located just across the road from Salamanca. This picturesque row of four-storey sandstone warehouses is a classic example of Australian colonial architecture. Dating back to the whaling days of the 1830s, Salamanca was the hub of Hobart's trade and commerce. By the mid-20th century many of the warehouses had fallen into ruin, before restorations began in the 1970s. These days Salamanca hosts myriad restaurants, cafes, bars and shops, and the unmissable Saturday morning Salamanca Market.



## Winter School Agenda

	Monday June 15	Tuesday June 16	Wednesday June 17	Thursday June 18	Friday June 19
8.30-9.00	Registration Introduction & welcome <b>(Melissa Hart, Pete Strutton)</b>				
9.00-10.00	L1- Overview of global carbon cycle, including anthropogenic perturbation <b>(Pete Strutton)</b>	L4- Riverine input and the chemical composition of the ocean; Geochemical box models <b>(Zanna Chase)</b>	L7. Biogeochemistry in ocean General Circulation Models <b>(Mathieu Mongin)</b>	L10. Introduction to the atmospheric radiation, energy balance and GHGs <b>(Robyn Schofield)</b>	L13. The atmospheric sulfur cycle, water, clouds and aerosols <b>(Robyn Schofield)</b>
10.00-11.00	L2- Oceanic Primary Production <b>(Pete Strutton)</b>	L5- Inorganic carbon chemistry in the ocean <b>(Zanna Chase)</b>	L8. Terrestrial Intro +N/P cycle <b>(Alex Johnson)</b>	L11. Terrestrial CO2 cycles <b>(Peter Rayner)</b>	L14. Climate change, crops and food security <b>(Alex Johnson)</b>
11.00-11.30	Morning tea	Morning tea	Morning tea	Morning tea	Morning tea
11.30-12.30	L3- Organic matter export and remineralization + N/P cycle <b>(Pete Strutton)</b>	L6- Role of the ocean in glacial-interglacial changes in atmospheric CO2 <b>(Zanna Chase)</b>	L9. Environmental policy – the Montreal protocol, climate and air quality policy <b>(Robyn Schofield)</b>	L12. Modelling terrestrial biosphere <b>(Peter Rayner)</b>	L15. CO2 cycle - climate feedbacks <b>(Peter Rayner)</b>
12.30-1.30	Lunch	Lunch	Lunch	Lunch	Lunch
1.30-5.00	Lab 1: N-P-Z-D modelling Lab 2: Introduction to NASA Giovanni interface for satellite ocean colour data	Lab 1: Introduction to software to calculate the inorganic carbon system in seawater Lab 2: Exploration of a 3-box model of the ocean	Climate negotiations	Introduction to Australia's Marine Virtual Laboratory (MARVL)  Lab: Parameterized biosphere model	Lab: Atmos inverse model- box model  Bus Departs for Airport at 3pm
Evening	Icebreaker (pizza and drinks) IMAS, from 5pm.			Dark MOFO Winter Feast. <small>(Entry ticket only provided, you must enter the feast by 6pm)</small>	



## IT/ Wifi Details

IT accounts will be assigned to students during check in on Monday. ID will be required and accounts will enable students to log onto computers in the lab.

A public wireless network will be available for use and passwords will be distributed on Monday morning.

## Food

Morning tea and lunch will be provided throughout the week. Dinner will be provided during the Icebreaker on the Monday night. On the Thursday night you have the option to attend the Dark MOFO winter feast, we will provide your entrance ticket, however you will need to buy your own dinner. For all other meals you are on your own.

## Social Events

### Monday Night: Ice breaker at IMAS– Pizza and Drinks

The Icebreaker will start just after the lab finishes. Pizza and drinks will be provided. This will be a great opportunity to meet with your Climate Negotiations lab group and talk strategy.

### Thursday Night: Dark Mofo – Winter feast

On the Thursday night we have bought entry tickets for the Dark MOFO winter feast. These tickets are in short supply, so we will ask you to confirm your attendance during Monday's Icebreaker.

The Museum of Old and New Art's (MONA) winter festival Dark Mofo attracts more than 120 000 people to Hobart, over 10 days each June, to celebrate the dark through large-scale public art, food, film, music, light and noise.

Dark Mofo Winter Feast, has been expanded to five nights of "feasting and fire" at the Princes Wharf featuring a range of guest chefs and culminating with a Balinese [ogoh-ogoh](#) parade on the winter solstice night.

*Please note that tickets will be provided for entry between 4-6pm. Food and drinks will be at your own expense.*



## Who Can Help



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