

PhD scholarships on jetlag strategies and ultra-long haul flights

Multiple full and top-up PhD scholarships are available at [the University of Sydney](https://www.theuniversityofsydney.edu.au) on the ARC Linkage project “Paving the way for ultra-long-haul flights: strategies to mitigate jetlag” (InSync); A Sydney Uni – Qantas partnership.



InSync project

Circadian clocks regulate nearly all aspects of human physiology and behaviour, synchronising our body functions with the 24-hour day-night cycle. Proper alignment of these internal clocks with our environment and behaviour is crucial for maintaining overall health, impacting everything from cognitive performance to metabolic processes. Jetlag is one example of circadian misalignment, which, while short-lived, affects millions of air travellers daily, increasing the risk of accidents, loss of productivity, and metabolic disturbances.

This project aims to develop and test strategies to mitigate jetlag, founded on biophysical modelling of circadian rhythms. It sets out to quantify the speed of circadian adaptation of sleep, alertness, and metabolism after transmeridian travel and to maximise it via optimised timing of in-flight and on-the-ground light exposure, sleep, food, and exercise. Among the expected outcomes are powerful models for jetlag strategies that are ready for application in air travel. The project will directly inform jetlag management for Qantas ultra-long haul flights and their International Network more broadly. Project outcomes will benefit society and the economy by improving travellers’ alertness and sleep and reducing the risk of fatigue-related accidents.

InSync is an interdisciplinary project involving scientists from the fields of physics, engineering, chronobiology, sleep, nutrition, and physical activity, as well as industry collaboration. The organisations involved are the University of Sydney, Qantas Airways, Monash University, and Washington State University.

See [here](#) for more information on the Sydney Uni – Qantas partnership.

PhD topics

Multiple experimental and computational PhD topics are available within the InSync project, including (but not limited to):

- **Modelling:** Mathematical modelling and physics of brain dynamics and optimisation of sleep and circadian rhythms to minimise jetlag.
- **Behaviour:** Effects of time zone changes and jetlag interventions on sleep, physical activity, nutrition, and light exposure.
- **Alertness:** Changes in performance, sleepiness, mood, and subjective jetlag associated with circadian misalignment and jetlag interventions.
- **Metabolism:** Effects of flight and jetlag interventions on metabolism and physiology, such as glucose concentration and body temperature.
- **Metabolomics:** Innovative methods to measure circadian rhythms, e.g., through liquid chromatography-mass spectrometry; circadian rhythms and effects of jetlag on metabolites.

Students may work on a project within one or across multiple topics. All PhD projects will be adjusted in collaboration with the successful candidates based on their background, interests, and alignment



with the main project aims. All students will gain experience in interdisciplinary collaboration and collaboration with industry, as well as solving real-life problems and implementing solutions.

The students' main location, supervisory team, and degree will depend on their selected project. The main locations are the School of Physics at the Faculty of Science and the various schools of the Faculty of Medicine and Health. All students will be affiliated with the [Charles Perkins Centre](#).

The supervisory teams will involve multiple InSync Chief Investigators across the disciplines of the student's project. The lead supervisors are: [A/Prof Svetlana Postnova](#) (Physics, Chronobiology), [Dr Yu Sun Bin](#) (Sleep Medicine), [Prof Corinne Caillaud](#) (Physical activity, exercise and Digital Health), [Prof Margaret Allmann-Farinelli](#) (nutrition and metabolism).

Eligibility

Both domestic and international students are encouraged to apply. Students should have an Honours 1 (first class) or an equivalent degree (e.g., Masters with $\geq 25\%$ load as research and $WAM \geq 80$). Students with Honours 2 (second class) will be considered if they can demonstrate research experience relevant to the project. Successful students will be selected based on merit and fit for the project. The start date is expected between October 2024 and July 2025.

To-up scholarships can only be awarded to students with a scholarship offer from the University of Sydney (e.g., RTP) and whose lead supervisor is one of the InSync chief investigators. Their project must be aligned with InSync.

How to express your interest

Please send the documents below to cpc.jetlag@sydney.edu.au:

- CV
- academic transcripts, and
- a brief (<200 words) statement about your research interests and the project topics you are interested in.

Due date: The application will stay open until the positions are filled.

The selected candidates will then be required to apply for admission and the scholarship through the University of Sydney portal.

For questions, contact A/Prof Svetlana Postnova (svetlana.postnova@sydney.edu.au)

InSync Chief Investigators

A/Prof Svetlana Postnova (USYD)

Dr YuSun Bin (USYD)

Prof Stephen Simpson (USYD)

Mr Philip Capps (Qantas)

Prof. Corinne Caillaud (USYD)

Prof. Margaret Allman-Farinelli (USYD)

Prof. Philip de Chazal (USYD)

Prof. Peter Cistulli (USYD)

Dr Tracey Sletten (Monash)

Prof. Emmanuel Stamatakis (USYD)

Prof. Hans van Dongen (WSU)