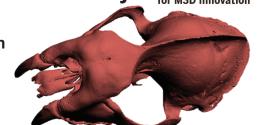# PhD opportunity at the **Australian National University**

We are offering a fully-funded 3 year PhD position at the Australian National University. The project will employ 3D modelling approaches to understand how bats modify sound during echolocation.

PROJECT BACKGROUND

Bats possess some of the most extreme mammalian adaptations. Having evolved both echolocation and self-powered flight, bats underwent one of the greatest adaptive radiations in mammalian history, which enabled them to exploit an enormous untapped foraging niche: insects in the night sky. Bat echolocation is considered one of the most complex and diverse modes of sensory perception in animals, but its origin and evolutionary history is a highly contentious issue that remains unresolved. This is due to difficulty in inferring the echolocation capabilities of fossil species, along with a lack of molecular markers for echolocation in bats and their potential relatives. The broad aim of this project is to combine insights from craniofacial development, evolution and form-function engineering tests to uncover echolocation traits and assess how differences in cranial shape relate to sound production.

THE PHD PROJECT

The PhD student will use 3D scan data, represented by diceCT (soft-tissue stained) and microCT, to construct and validate engineering models that simulate airway function in bats. These models will be used to understand the functional implications of cranial shape variation among echolocators.

THE PROJECT TEAM

The PhD student will work with a multi-disciplinary team of researchers, led by Dr Laura Wilson at ANU, in collaboration with Dr Jason Bourke (New York Institute of Technology), Assoc. Prof. Alistair Evans (Monash University) and Assoc. Prof. Daisuke Koyabu (University of Tsukuba, Japan).

THE STUDENT

The successful applicant must have an excellent grade (i.e. H1 or HD/First Class International equivalent) in an Honours or MSc research program in a relevant subject area and proven skills in scientific writing. The student should have a strong quantitative background in evolutinary morphology/zoology or, preferably, engineering and a willingness to learn computational modelling approaches. Experience with Finite Element Modelling or Computational Fluid Dynamics is desirable.

THE INSTITUTION

The Australian National University is a member of the Group of Eight, Australia's leading research-intensive universities, and is ranked 31st in the world (QS World Rankings 2021). To find out more about research in our labs, please see: Wilson - https://tinyurl.com/h9tctbmh, Koyabu - https://tinyurl.com/jphbnxdh, Evans - http://evomorph.org, Bourke - https://tinyurl.com/62yexdh3

The student will be embedded within the ARC ITTC on multiscale 3D imaging, modelling and manufacturing at the ANU: https://m3d.edu.au

APPLICATIONS

Interested applicants should send a cover letter outlining their motivation and experience, an academic CV, and a list of contact information for 1-3 academic referees to Dr Laura Wilson (Laura.Wilson@anu.edu.au) by **3 Sept 2021**. This scholarship is open to Australian citizens, permanent residents and international students.

The successful candidate will be awarded a 3-year PhD scholarship (~AU $28,597 p.a. tax free [2021 rate], indexed annually), with top-up available ($5,000 p.a.) for qualified candidates. Start date anticipated Oct-Nov 2021.