

## A PhD Scholarship in **SPARC Hub**

### The Opportunity

The ARC Smart Pavements Hub (SPARC) invites applications for a PhD-position in evaluating thermal responses of car-park pavement energy systems.

### Smart Pavements Australia Research Collaboration ([SPARC](#))

SPARC Hub, which is a partnership between Monash and 7 other Australian Universities and 20+ Industry Partners, is embarking on a range of exciting research projects, offering an unprecedented opportunity for recent graduates to establish their postgraduate career in various engineering fields. The Hub offers a coherent PhD and Masters by research program for high achieving passionate students and is committed to create an intellectually exhilarating and vibrant environment towards excellence.

### Project Background

Pavement energy systems offer a low-cost environmental friendly method of providing useful thermal energy to nearby buildings. These pavements can be used as a heat source/sink to assist in heating/cooling of built structures or energy use in infrastructures (lighting, etc.) via the use of a ground source heat pump. Heat transfer fluids such as water flow in pipes installed within the pavement without any significant modifications to its initial design. The additional temperature changes of the pavement resulting from the operation of the heat pump may lead to thermal changes in the pavement which may not be accounted for in the initial design. Accordingly, a thorough evaluation of thermal responses of the pavement under various operational conditions and recommendations for practice is required.

This project aims to establish baseline knowledge on the effects of key parameters of pavement energy systems on their thermal performances, which can later be used as a guide to develop field-scale installations. Targeted experimental studies and numerical simulations will be undertaken to evaluate the long-term thermal response of pavement systems under relevant parameters encountered in the field (i.e. mechanical loads imposed by cars on the pavement, variations in solar radiation, ground and atmospheric temperatures in Melbourne, soil moisture and strength variations, and different water temperatures flowing in the pipes arising from seasonal changes).

### Qualification Requirements

1. Applicants must have completed at least a bachelor's degree in one of the following areas: Geomechanical Engineering, Civil Engineering, Applied Physics, and Mechanical Engineering. Both Australian and international applicants will be considered
2. The applicant must have a strong academic record, which, for example, amounts to a grade point average (GPA) of 3.7 (out of 4.0) or higher, or equivalent to H1 or First Class Honours Degree
3. The applicant should have some knowledge/background and/or interest in the following areas: Hydrothermal modelling, Road pavement systems
4. The applicant must have an interest in undertaking field work
5. The following criteria will be considered during the assessment:
  - (i) Candidate's academic performance in the bachelor's degree (or Master's degree),
  - (ii) Quality of the degree completed (preference will be given to Master's degree),
  - (iii) Completion time of the degree,
  - (iv) Knowledge in the relevant research field including any publications in reputable journals,
  - (v) English language proficiency (refer to the following link for more information: [English Language Requirements](#)), and

(vi) Online interviews and references.

**Faculty / Portfolio:** Department of Civil Engineering, Faculty of Engineering

**Location:** Clayton campus, Monash University

**Remuneration:** Stipend can range from \$27,872 to 32,300 p.a. full-time rate (pro-rata) and tax-free

**Closing date for expression of interest (EOI):** 13th of September, 2019

**To Apply:**

- Submit an [Expression of Interest](#)
- A curriculum vitae, including a list of published works
- A full statement of academic record, supported by scanned copies of relevant certified documentation
- Contact details of two academic referees
- Evidence of English-language proficiency (international applicants only)

**Enquiries and EOIs shall be sent to:**

The Lead Chief Investigator, [Professor Abdelmalek Bouazza](#), Dept. of Civil Eng., Monash University, Clayton Campus (Australia)

Email: [Malek.Bouazza@monash.edu](mailto:Malek.Bouazza@monash.edu)