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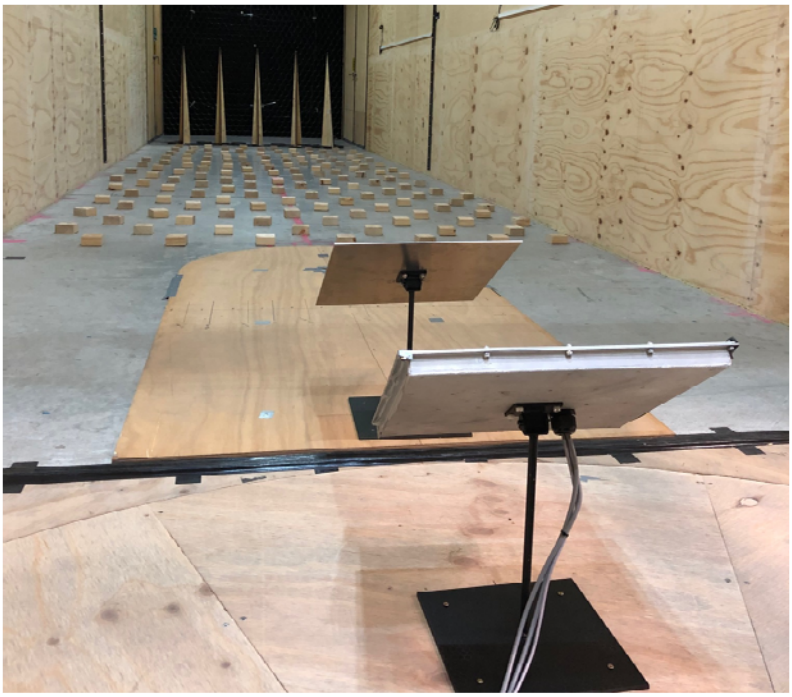

Faculty of Engineering, Computer and Mathematical Sciences

HELIOSTAT DYNAMIC WIND LOAD

Up for a challenge? Join us to work on a research project with the Australian Solar Thermal Research Institute (ASTRI) heliostat dynamic wind load project.

At a Glance

Who can apply?

- Australian Citizens
- Onshore International students
- International applicants

Industry partner or funding body

- Australian Solar Thermal Research Institute (ASTRI)
- Australian Renewable Energy Agency (ARENA)

Program of Study available

- Doctor of Philosophy (PhD)

Total annual stipend amount

- $28,092 pa (if Commonwealth RTP scholarship secured)
- $10,000 pa top-up from ASTRI

Start date

- January 2021

About the project

Heliostats are arranged in staggered rows surrounding a central tower to maximise the efficiency of thermal energy collected at the receiver. The aerodynamic effects of vortex shedding and wake interference in a heliostat field deviate significantly from the incoming ABL turbulence on a single heliostat, depending on the arrangement of the field and the spacing between the heliostats. The aim of this project is to develop a detailed understanding of the effect of field arrangement on the dynamic wind loads on heliostats. This is to be achieved through the design of a heliostat field model and the measurement of the wind loads on individual heliostats in wind tunnel experiments. Reduction of the dynamic wind loads on heliostats in different rows of a field due to vortex-induced vibrations from upstream heliostat vortex shedding and turbulence in the atmospheric boundary layer provides an opportunity to reduce the cost of the wind-sensitive heliostat components.

The heliostat wind load and aerodynamics research group aim to develop the understanding of the turbulence within the atmospheric boundary layer (ABL) through experimental measurements in a large-scale wind tunnel at the University of Adelaide. Innovative techniques for characterisation of the flow-induced aerodynamic loading on heliostats has been an ongoing research activity of the heliostat technology development stream of the Australian Solar Thermal Research Institute (ASTRI) since its inception in

2013. The focus of the heliostat aerodynamics project is to improve the design methods for wind load predictions and reduce the capital cost of manufacturing the heliostat components for commercial projects in the concentrating solar thermal industry. ASTRI is funded by the Australian Renewable Energy Agency (ARENA). Further information is available at https://www.astri.org.au

The School of Mechanical Engineering at the University of Adelaide was ranked in the top 100 of Academic Ranking of World Universities (ARWU) in 2019. The Centre for Energy Technology (CET) are internationally recognised for their leading research into clean energy technologies and practices that reduce emissions, increase energy efficiency and decrease the cost of energy. The CET is one of South Australia's fastest-growing research groups working to transition our society to renewable energy, including a contribution to solar thermal energy research in ASTRI. Further details on the heliostat wind load and aerodynamics research group, publications, experimental facilities and data can be found at https://www.adelaide.edu.au/cet/technologies/heliostat-wind-loads

Eligibility criteria

- Applicants with strong experimental and numerical skills in fluid mechanics and aerodynamics, particularly in wind tunnel experiments or CFD/FEA will be considered favourably.
- Excellent students who hold a Bachelor of Mechanical Engineering or a double degree with Civil Engineering would be especially suitable and encouraged to apply.
- Applicants with well-developed written and verbal communication skills will be considered favourably.

Benefits

- Access to authorised travel and research project funds available
- Work alongside world leading researchers
- Our CaRST program: Free professional development to enhance your employability skills
- Exposure to industry networks and experts in the field
- No Tuition fees! These are waived for eligible candidates
- Access state of the art technology
- Become a field expert and make a real and contribute to solving global challenges
- Publish your contributions and impact our communities and society

How to apply

- Complete an expression of interest and email together with a copy of your CV and transcripts to matthew.emes@adelaide.edu.au or maziar.arjomandi@adelaide.edu.au
- Once your initial eligibility assessment is approved, formally lodge an application for admission and scholarship via the Adelaide Graduate Centre 'How to Apply' link. **Application dates are listed on the website.**

Researcher Profiles

- Use our Researcher Profiles to find out more about potential supervisors

More about ECMS

The Faculty of Engineering, Computer and Mathematical Sciences is home to world-class research institutes and centres, and internationally renowned academics at the cutting edge of research and discovery.

We are a thriving centre of learning, teaching and research in a vast range of engineering disciplines, computer science, machine learning and high-level mathematics as well as designing Human-centred, sustainable futures in our School of Architecture and Built Environments.

Many of our academic staff are leaders in their fields and graduates are highly regarded by employers.

Learn more about the Faculty of Engineering, Computer and Mathematical Science's Research capabilities at: https://ecms.adelaide.edu.au/research-impact

FURTHER INFORMATION

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