UNSW AUSTRALIA
Canberra

PhD Scholarship

Maximum Entropy Analysis of Turbulent Fluid Flows and/or Flow Networks (funded by Australian Research Council Discovery Grant)

Never Stand Still

One or more PhD scholarship(s) is available immediately at UNSW Canberra, on the maximum entropy (MaxEnt) analysis of turbulent fluid flows. The project is supervised by Dr Robert Niven of UNSW Canberra, Australia, in collaboration with Prof. Bernd Noack of Institut Pprime, Poitiers, France, and is funded by an Australian Research Council Discovery Grant. The scholarship concerns the application of Jaynes' MaxEnt method to the analysis of fluid flow systems, and could develop under one or more themes: (1) maximum-entropy closures of reduced-order Galerkin models of complex and turbulent flows; (2) construction and synthesis of maximum-entropy models of dissipative flow systems, including the effect of scale; (3) maximum-entropy and Bayesian model inference from turbulent flow experimental data; and/or (4) maximum-entropy modelling of flow networks, with specific attention to transport networks, chemical reaction networks and/or the turbulence cascade. It is anticipated that this project will lead to major advances in the theoretical and numerical analysis of turbulent flows and networked flow systems.

Candidates should have a four-year Bachelor degree in a branch of the physical sciences, engineering or mathematics, with a grade equivalent to an Australian Honours Class 1. A Masters degree in a relevant discipline will be regarded favourably. Knowledge of the maximum entropy method of Jaynes, and subject expertise in one or more of the four themes, are not essential but will be highly regarded. A candidate with a strong academic record, with well-developed numerical or theoretical skills and the ability to cross disciplinary boundaries, is sought for the position.

The successful applicant, subject to satisfying Australian immigration and University admission requirements, will be awarded a PhD stipend of $26,392 per annum (tax free, indexed annually) and, if necessary, a scholarship for remission of tuition fees. This scholarship is for a period of 3 years, subject to satisfactory progress reviews. The successful applicant should be available to commence his/her studies as soon as possible (and no later than the start of 2015). If outstanding candidates apply, more than one position may be recruited. Applications will be accepted until a suitable candidate is found.

While employed in Australia, an essential requirement of this position is the need to undertake international research collaborations, especially in France and/or Germany. The successful applicant should therefore be willing and able to undertake periodic (funded) international research visits to Europe as part of this position.

The Canberra campus of the University of New South Wales is located at the Australian Defence Force Academy (ADFA). This is located in an Australian bushland setting less than five kilometres from the city centre and the Canberra airport. The UNSW Canberra campus has a large and comprehensive library, state-of-the-art computing facilities and well-equipped, modern laboratories.

For further information and submission of applications, please contact:

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All email correspondence should be sent under the subject heading "Application for PhD Scholarship: MaxEnt Analysis", and cc'd to Prof. Bernd Noack at bernd.noack@univ-poitiers.fr

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