Fellowship project summary:
This project aims to transform the understanding of the structure and function of the brain as a complex physical system. It aims to reveal and unify new aspects of information processing, transitions in conscious state, and nonlinear brain interactions by translating and applying concepts and methods from physics and mathematics. It will treat brain structure and dynamics together to address emergent phenomena like waves and patterns on multiple scales, treating waves as equal participants alongside neurons. Innovative predictions of brain phenomena will aim to be verified against data and used to understand brain networks, dynamics, and the physical phenomena underlying information processing and consciousness.

About Professor Robinson
Professor Peter Robinson is a double ARC Federation Fellow who works on a range of complex systems topics spanning brain dynamics, imaging, biological physics, computational neuroscience, nonlinear and stochastic dynamics, plasmas, and other areas.

Peter Robinson received his BSc and PhD in Theoretical Physics from The University of Sydney, then worked at the University of Colorado before returning to Australia as a QEII Fellow. He then took up a faculty position in the School of Physics, obtaining a chair in 2000, a Federation Fellowship in 2003, and a second Federation Fellowship in 2008. He has led research initiatives in multiple fields, including plasma and space physics, brain dynamics, computational neuroscience, imaging, and biological physics. His core research focus is on interdisciplinary research with an emphasis on translation of results into real-world applications. This involves a range of theoretical, computational, and experimental collaborations, including strong commercial and industrial interactions.

Professor Robinson’s research has resulted in over 310 journal papers and his industry involvement includes patents, collaborations, and the float of Brain Resource Ltd on the Australian Stock Exchange. He is highly awarded, including the Australian Academy of Science Pawsey Medal and Bede Morris Fellowship, the Royal Societies’ Eureka Prize for Interdisciplinary Research and Edgeworth David Medal, and the Australian Institute of Physics’s Walter Boas Medal.

Find out more about Professor Robinson and his research by visiting The University of Sydney website.

For more information on the Australian Laureate Fellowships scheme, visit the ARC website.