Dr. Yihong Du

University of New England
Australia

Dr Yihong Du is a professor at the University of New England, Australia. He obtained his PhD in 1988 from Shandong University, China. He has been working at the University of New England since 1991, starting as a postdoctoral research fellow of Prof. E.N. Dancer, and becoming a full Professor in 2008. Dr Du is interested in mathematical problems arising from applications in other sciences, such as biology, invasion ecology and chemical reaction theory. Some of his recent works investigate mathematical models for propagation, such as spreading of diseases, or invasion of exotic species, which involve nonlinear elliptic and parabolic equations, often with a free boundary to represent the propagation front. For research achievements in this and other areas, he was elected a Fellow of the Australian Academy of Science in 2021.

Title: On the KPP equation with nonlocal diffusion and free boundaries

Abstract:
A new phenomenon in nonlocal diffusion models is that accelerated propagation may happen, that is, the propagation speed could be infinite, which never occurs in the corresponding local diffusion model with compactly supported initial data. In this talk, we will first briefly review the history of the KPP model used to describe the propagation of biological/chemical species, and then look at some very recent results on the KPP equation with nonlocal diffusion and free boundaries. For several natural classes of kernel functions appearing in the nonlocal diffusion term, we will show how the exact rate of acceleration can be determined. The talk is based on joint works with Dr Wenjie Ni.