

WILLIAM BENTER DISTINGUISHED LECTURE SERIES

A Series of Distinguished Lectures in Pure and Applied Mathematics

organized by

Liu Bie Ju Centre for Mathematical Sciences
City University of Hong Kong

Mathematics and Computation of Chaotic Systems, Turbulence and People

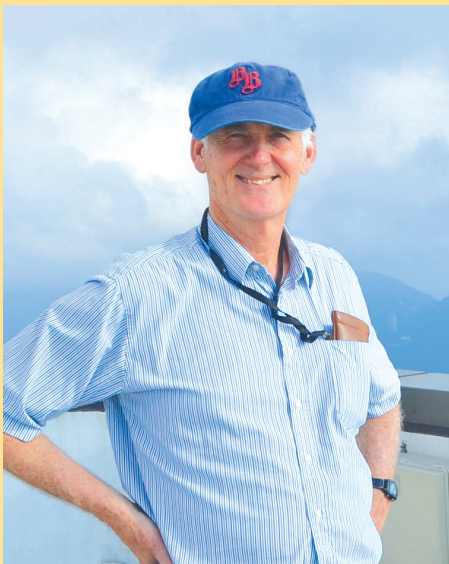
by

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Abstract

L F Richardson and other pioneering researchers from the 1920's onwards showed the distinct mathematical properties of the two major types of dynamical systems. The first is organised low dimensional models, with distinct patterns of often chaotic behaviour, which provide both understanding of idealised systems and then the means to control and modify in different ways important problems, including societal and national conflict, traffic dynamics, decision making in organisations and factors affecting mental health. In the second type of system, the models consist of interactions of random multi-scale components. Organised patterns also emerge, as in the eddies of fluid turbulence, and in the formation and evolution of social communities. Models of earth systems are a combination of the first and second types. A recent development, in low or high dimensional models, is to consider the introduction of semi-independent components in dynamical systems which interact locally and with the system as a whole. This approach can be used to help individuals and social groups using new communication and computation technology to act optimally, such as minimizing danger in flooding or other crisis situations in urban areas.

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Time : 15:00

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