

Pathways Lecture Series in Mathematics, KEIO



Speaker: **Prof. Christopher Budd**

(University of Bath / Royal Institution of Great Britain)

Place: Room 14-203, 2nd Floor, Bldg.14
Faculty of Science and Technology
KEIO University

Lecture 1 16:30 - 18:00 April 2, 2007 (Monday)

Lecture 2 16:30 - 18:00 April 3, 2007 (Tuesday)

Geometric integration and its applications

Numerical methods are often designed to give small local errors and do not take account of the broader qualitative features of the problems that they are trying to solve. However in many applications it is precisely these features that are important and we ignore them at our peril. For example, if we are trying to solve a system described by (ordinary or partial) differential equations then we might well be interested in such features as conservation laws, symmetries, orderings and long time asymptotics. Geometric integration methods take the approach that these are the key features of a system that we would like a numerical method to inherit, and that it is often much better to use a scheme which has a relatively large local error, if it preserves other features of the solution. In this series of lectures I will describe the theory, construction and application of geometric integration schemes, looking at a variety of problems ranging from celestial and molecular dynamics through to weather forecasting and image processing.

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