

PREFACE

## Mathematics for the fluid earth

To cite this article: T Kuna and S Vaienti 2017 *J. Phys. A: Math. Theor.* **50** 170301

View the [article online](#) for updates and enhancements.

### You may also like

- [Some properties of mixing repellers](#)  
S Vaienti
- [Integrated wavelets on fractal sets. II. The generalized dimensions](#)  
J -M Ghez and S Vaienti
- [Extreme value distributions of observation recurrences](#)  
Th Caby, D Faranda, S Vaienti et al.

## Preface



# Mathematics for the fluid earth

Due to the ever-increasing specialisation and division of science into an increasing number of different disciplines, the dissemination of ideas among researchers across disciplines becomes an ever-greater challenge, and a hindrance for scientific progress. Within the framework of the 'Mathematics for the Planet Earth 2013' program, an international high profile initiative aiming at tackling exactly this challenge in the areas of Earth Science, Physics and Mathematics, we were involved in a group of scientists organizing a series of events focused on the fluid part of the earth system. This comprised a three month programme at the Isaac Newton Institute, Cambridge, and further conferences, workshops and summer schools at the London Mathematical Society, and the Universities of Hamburg, Marseille and Reading.

The plan for this special issue grew out of discussions with participants at these activities. The idea was that instead of the format of a classical proceeding, to aim for a special issue to encourage contributions either in the form of review papers or papers presenting new research, in order that we could collect a coherent body of text. These contributions cover the whole spectrum, ranging from mathematical papers attempting to address general questions concerning dynamical problems (e.g. Zhao and Pesin studying new topological invariants), to articles considering this question for more realistic problems in the spirit of theoretical physics (e.g. Saffioti, Malguzzi and Speranza studying the planetary scale inertial fluctuations and their temporal-spatial scales), to papers applying new mathematical tools to concrete physical situations and models of the fluid earth system (e.g. Yalcin, Rabassa and Beck studying the extremal index of daily rainfalls). The selection of articles cited above should not be seen as a judgment of quality, but as examples of the above mentioned types. The link and the common objective among the articles of this issue is the systematic approach to non-linear or multi-scale physical phenomena so typical for the fluid earth system, often with the help of probabilistic tools.

First of all we would like to thank our authors for all their hard work, and this volume is all about them. We are grateful to our anonymous referees for the work they were willing to dedicate to our issue. Furthermore, we would like to thank our colleagues Mike Cullen, Beatrice Pelloni and Valerio Lucarini for organizing the above mentioned events, without which this issue would not have been possible. They never ceased to support us. We would like to thank the Newton Institute, London Mathematical Society, Walker Institute, University of Reading, and the ERC grant NAMASTE which gave us the necessary support in respect to these activities.

Last but not least, we owe gratitude to the editorial board of the *Journal of Physics A* for giving us this opportunity. We would also like to thank the staff of IOP Publishing, in particular Elaine Parker and Sarah Whitehouse, for their continuous support which was so vital to the preparation of this volume.

## Guest Editors

**T Kuna<sup>1</sup> and S Vaienti<sup>2</sup>**

<sup>1</sup> University of Reading, Department of Mathematics and Statistics, Whiteknights Campus,  
Reading, RG6 6AX, United Kingdom

<sup>2</sup> Aix Marseille Univ, Univ Toulon, CNRS, CPT, Marseille, France

E-mail: [t.kuna@reading.ac.uk](mailto:t.kuna@reading.ac.uk)