



ISAAC NEWTON INSTITUTE  
FOR MATHEMATICAL SCIENCES

The recent six-months' programme on "Highly oscillatory problems: Computation, theory and applications" at the Isaac Newton Institute of Mathematical Sciences (January–July 2007) represented an important paradigm shift. Historically research into high oscillation had been scattered across many subject areas of pure and applied mathematics, with little cross-disciplinary communication and interaction. The INI programme rendered high oscillation into an organising principle for concerted inter-disciplinary research effort. An important purpose of the proposed conference is to follow up on the success of the INI programme and continue to foster the knowledge base of mathematical research into high oscillation across different disciplines and subject areas, with particular emphasis on computational issues. Cross disciplinarity of the proposed conference is not just a convenient optional extra, it is in the very nature of the underlying subject matter. As the INI programme demonstrated, it is absolutely essential to bring together the different threads of high oscillation research, from mathematical theory, computation and the varied application areas, forge common terminology and learn from each other. It is equally important to maintain constant flow of ideas between mathematical experts and workers in the many application areas where high oscillation is such an important phenomenon.

Among the many issues we plan to address in the conference, we wish to single out the following:

1. Electromagnetic and acoustic scattering
2. Wave mechanics
3. Multiscale problems
4. Homogenisation
5. Symplectic algorithms
6. Computational asymptotics
7. Riemann–Hilbert techniques
8. Theory of highly oscillatory partial differential equations

Conference format:

- lectures by invited high level speakers
- short talks by young & early stage researchers
- poster sessions, round table and open discussion periods
- forward look panel discussion about future developments

## RESEARCH CONFERENCES

ESF Mathematics Conference in Partnership with  
EMS and ERCOM/INI

# Highly Oscillatory Problems: From Theory to Applications

The Isaac Newton Institute, Cambridge, UK

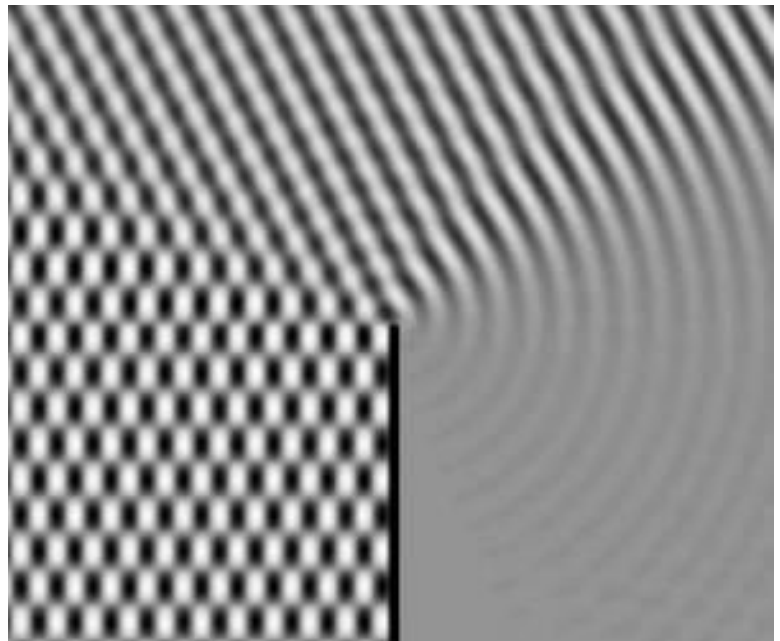
**12-17 September 2010**

**Chair: Arieh Iserles**, Cambridge University, UK

**Co-chair: Claude Le Bris** - ENPC, Champs-sur-Marne, FR

**Organising Committee:** **Folkmar Bornemann** - TU München, DE; **Simon Chandler-Wilde** - Reading U. UK; **Bjorn Engquist** - Texas U., Austin, US & KTH Stockholm, SE; **Ernst Hairer** - U. Genève, CH; **Laurence Halpern** - U. Paris XIII, FR; **Ralf Hiptmair** - ETH Zürich, CH

Diffraction of highly oscillatory wave in the solution of the Helmholtz equation



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### Invited Speakers will include:

**Assyr Abdulle** - EPFL Lausanne, CH

**Dario Bambusi** - U. Milano, IT

**Oscar Bruno** - Caltech, US

**Weinan E** - Princeton U., US

**Yalchin Efendiev** - Texas A&M, US

**Thanasis Fokas** - Cambridge U., UK

**Irene Fonseca** - Carnegie Mellon U., US

**Daan Huybrechs** - KU Leuven, BE

**Caroline Lasser** - FU Berlin, DE

**Tony Lelièvre** - CERMICS/ENPC, FR

**Christian Lubich** - Tübingen U., DE

**Peter Markowich** - Cambridge U., UK

**Houman Owhadi** - Caltech, US

**Ilaria Perugia** - Pavia U., IT

**Chus Sanz-Serna** - U. Valladolid, ES

**Andrew Stuart** - U. Warwick, UK

**Isabelle Terrasse** - Aerospatiale Paris, FR

**Edriss Titi** - Weizmann, IL & UC Irvine, US

Application form & programme available from

[www.esf.org/conferences/10340](http://www.esf.org/conferences/10340)

Applications received up until **2 April 2010** only will be considered for grants. **Deadline for all applications 12 June 2010.**

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