WIN-2012

Wave Interactions

February 7 – 12, 2012

Johannes Kepler University, Linz, Austria

In the wave interaction theory nonlinear problems are treated in broad categories, on the basis of mathematical rather than physical similarity. This is possible due to the fact that many ideas and phenomena recur in such apperently diverse fields as rigid-body and fluid mechanics, plasmas physics, optics, biology, economics, etc.
The theory of wave interactions aims at describing the dynamical and statistical properties of a weakly nonlinear wave system. Dynamical characteristics are used to describe phenomena occuring due to interactions of a small number of harmonics, while stastistical approach (usually called wave turbulence theory) is used for describing energy distribution over scales in the wave systems with distributed initial state. These systems occur in oceanology, optics, plasmas, etc. and their energy spectra are described by solutions of wave kinetic equation first introduced by Klaus Hasselmann in 1962.
In the following 50 years a great progress has been achieved in the theoretical understanding of statistically described wave systems. However, controlled experiments specifically designed to study wave interactions and turbulence are relatively scarce, and there is still a lot of open problems demanding detailed studies. The principal idea of the workshop is to discuss and put forward a list of regularly observable wave interaction phenomena which are not fully explained by the existing theories thus opening new avenues for further investigations.

Opening talk

PETER JANSSEN (European Centre for Medium-Range Weather Forecasts, UK) WAVE FORCASTING AND EXTREME EVENTS

Educational lectures

Key-note lecture: KRISTIAN DYSTHE (University of Bergen, Norway) THE BENJAMIN-FEIR INSTABILITY - A POPULAR AND DEBATED TOPIC

Elena Kartashova (Johannes Kepler University, Linz, Austria) WAVE SYSTEMS WITH NARROW FREQUENCY BAND EXCITATION
Miguel Onorato (University of Torino, Italy) ROGUE WAVES AND MODULATION INSTABILITY IN THE OCEAN
Efim Pelinovsky (Institute of Applied Physics, Nizhny Novgorod, Russia) NONLINEAR DYNAMICS OF TSUNAMI
Sergei K. Turitsyn (Aston University, UK) OPTICAL WAVE TURBULENCE IN FIBRE LASERS AND LINEAR OPTICAL ROGUE WAVES

Invited speakers

- **Sergey Badulin** (Russia)
- **Eric Falcon** (France)
- **Norbert Hoffmann** (Germany)
- **Christophe Josserand** (France)
- **Agnès Maurel** (France)
- **Nicolas Mordant** (France)
- **Efim Pelinovsky** (Russia)
- **Arkady Pikovsky** (Germany)
- **Davide Proment** (Italy)
- **Stephane Randoux** (France)
- **Anna Sergeeva** (Russia)
- **Roman Shamin** (Russia)
- **Alexey Slunyaev** (UK)
- **Pierre Suret** (France)
- **Tatiana Talipova** (Russia)

Scientific committee

- Walter Munk *Scripps Institution of Oceanography, La Jolla, CA, USA*
- Efim Pelinovsky *Institute of Applied Physics, Nizhny Novgorod, Russia*
- Miguel Onorato *University of Turin, Italy*
- Elena Kartashova *Johannes Kepler University, Linz, Austria*

Organizing committee

- James B. Cooper (cooper@bayou.uni-linz.ac.at)
- Renata Fleischner (renata.fleischner@jku.at)
- Elena Kartashova (elena.kartaschova@jku.at)
- Igor V. Shugan (ishugan@rambler.ru)
- Petro Yudytskiy (petro.yudytskiy@jku.at)

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