Abstract. This workshop was devoted to recent progress in the mathematical study of water waves, with special emphasis on nonlinear phenomena. Both aspects related to the governing equations (free boundary Euler equations) as well as aspects related to various model equations were of interest.

Mathematics Subject Classification (2000): 35, 76, 79.

Introduction by the Organisers

The workshop Wave Motion that took place in the period February 9–13, 2009 was dedicated to the study of nonlinear wave phenomena. Waves lie at the forefront of modern applied mathematics and theoretical physics. The study of wave phenomena leads to a variety of involved mathematical issues, such as partial differential equations, functional analysis, harmonic analysis, dynamical systems, bifurcation theory. Fluids have been a rich source of deep mathematical theories for over 200 years. The conference focused on four very active areas involving fluids:

- water waves with vorticity,
- stability theory of fluids,
- mathematical aspects of edge waves,
- current aspects of integrable systems and solitons.

The programme of the workshop consisted in 17 talks, presented by international experts in nonlinear waves coming from Austria, China, England, France, Germany, Ireland, Italy, Norway, Sweden, U.S.A., and by three discussion sessions.
on the topics “Modelling of water waves”, “Waves of large amplitude”, “Inte-
grable shallow water equations”. Moreover, several doctoral and post-doctoral
fellows participated in the workshop and did benefit from the unique academic
atmosphere at the Oberwolfach Institute. The organisers gratefully acknowledge
the support of two younger scientists by the Leibniz Association within the grant
“Oberwolfach Leibniz Graduate Students”.

The proceedings of the workshop will appear as a special issue of the journal Wave
Motion.