Abstract. The workshop dealt with the partial differential equations that describe fluid motion, namely the Euler equations and the Navier-Stokes equations. Many of the lectures concerned questions of existence and regularity of solutions, possibly weak solutions, of these equations and somewhat simpler variants.

Mathematics Subject Classification (2000): 76, 35.

Introduction by the Organisers

The workshop “Mathematical Aspects of Hydrodynamics” was held in August 12-18, 2012. For personal reasons the original organisers, Peter Constantin (Princeton) and Gregory Seregin (Oxford), were regrettably unable to attend the workshop. Two additional organisers, Susan Friedlander (Los Angeles) and Edriss S. Titi (Irvine and Rehovot) were added and they were present throughout the workshop. The scientific program consisted of 26 main talks (about 40 minutes each with additional 20 minutes were allocated for discussion) and 3 shorter contributions (posters plus 10 minute talks). There was plenty of time for discussions during and after the lectures and in private groups.

The emphasis of the meeting was on various mathematical facets of incompressible fluid dynamics, however one session was devoted to issues connected with compressible flows. A lecture on an important, very new result concerning the existence of dissipative, Holder continuous, incompressible solutions for the Euler flows opened the workshop. The main topics discussed at the meeting included: turbulence and weak solutions of the Euler equation, regularity questions
for the Navier-Stokes equations, breaking solutions to the inviscid water wave equation, active scalar equations, issues of stability and instability, the limit of vanishing viscosity, aspects of magnetohydrodynamics, new numerical schemes for the Navier-Stokes equations, and stochastic systems related to fluid models.

There were 42 participants from 13 different countries, namely Germany, US, UK, Russia, France, Spain, Czech Republic, Lithuania, Canada, China, Japan and Korea. One organiser and one postdoc were women. Approximately 10 participants were young researchers who came to Oberwolfach for the first time.

The afternoon of the hike was very warm but a good number participated in the hike and everyone enjoyed the barbecue on the patio after the hike. A delightful musical trio provided entertainment.

The organisers thank the Institute staff for their great hospitality and support before and during the conference which was very well run. Financial support for young participants from the Leibniz Association and the National Science Foundation is gratefully acknowledged.
Workshop: Mathematical Aspects of Hydrodynamics

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