

Preface

The topic of the 2010 Abel Symposium was *Nonlinear Partial Differential Equations*. The study of differential equations is of fundamental importance in mathematics and in almost all of the applications of mathematics in natural sciences, economics, and engineering. This area of mathematics is currently in the midst of an unprecedented development worldwide. Differential equations are used to model phenomena of increasing complexity, and in areas that have traditionally been outside the realm of mathematics. New analytical tools and mathematical theories, coupled with new numerical methods, are dramatically improving our understanding of nonlinear models. Nonlinearity gives rise to solutions having singularities, oscillations, or concentration effects, which in the real world are reflected in the appearance of shock waves, turbulence, material defects, etc. These effects frequently require new techniques, and offer challenging novel problems for mathematicians. On the other hand, new mathematical developments provide (numerical) solutions and new insight in many applications. The purpose of these Abel Symposium proceedings is to present a selection of the latest exciting results by world leading researchers in the area of nonlinear partial differential equations.

The Abel Symposium was hosted at the Norwegian Academy of Science and Letters, Oslo, from September 28 to October 2, 2010. Attendance was by invitation only, and the symposium had a total of 74 participants, out of which 32 were from Norwegian universities. The Scientific Committee consisted of Alberto Bressan (Penn State), Helge Holden (Trondheim), Kenneth H. Karlsen (Oslo), Sergiu Klainerman (Princeton), and Eitan Tadmor (Maryland).

Talks were presented by

Luigi Ambrosio (Pisa)
Alberto Bressan (Penn State)
Luis A. Caffarelli (Texas)
Gui-Qiang Chen (Oxford)
Camillo De Lellis (Zürich)
Maria J. Esteban (Paris)
Eduard Feireisl (Prague)

Gerhard Huisken (Golm)
 Carlos Kenig (Chicago)
 Alex Kiselev (Madison)
 Sergiu Klainerman (Princeton)
 Robert V. Kohn (New York)
 Pierre-Louis Lions (Paris)
 Andrew J. Majda (New York)
 Igor Rodnianski (Princeton)
 Laure Saint-Raymond (Paris)
 Eitan Tadmor (Maryland)
 Juan Luis Vazquez (Madrid)
 Cédric Villani (Lyon)

These proceedings include most of the lectures presented at the Abel Symposium, and the editors appreciate the efforts made by the speakers to present their talks in these proceedings.

Participants were:

Andreianov, Boris	Karper, Trygve	Risebro, Nils Henrik
Berre, Inga	Klausen, Runhild Aae	Rønquist, Einar
Borluk, Handan	Kvamsdal, Trond	Sande, Hilde
Bouchut, François	Kværnø, Anne	Selberg, Sigmund
Brenier, Yann	Langtangen,	Serre, Denis
Carrillo, José A.	Hans Petter	Signahl, Mikael
Celledoni, Elena	Li, Qifan	Svanstedt, Nils
Christiansen, Snorre H.	Lie, Knut Andreas	Süli, Endre
Colombo, Rinaldo M.	Lindqvist, Peter	Titi, Edriss S.
Dafermos, Constantine	Lyubarskii, Yurii	Trivisa, Konstantina
Engquist, Bjørn	Malinnikova, Eugenia	Tveito, Aslak
Evje, Steinar	Marcati, Pierangelo	Vasiliev, Alexander
Fuchs, Franz	Markina, Irina	Wasylewicz,
Golse, François	Munthe-Kaas, Hans	Agnieszka
Grong, Erlend	Nordbotten, Jan	Winther, Ragnar
Hanche-Olsen, Harald	Nørsett, Syvert P.	Xin, Zhouping
Jakobsen, Espen R.	Owren, Brynjulf	Yaguchi, Takaharu
Kalisch, Henrik	Raynaud, Xavier	Zanna, Antonella
Kalise, Dante		

We gratefully acknowledge financial support from the Niels Henrik Abel Memorial Fund, The Centre for Advanced Study at the Norwegian Academy of Science and Letters, as well as the Centre of Mathematics for Applications at the University of Oslo. The kind assistance of Ms Marit F. Strøm is greatly appreciated. Thanks go to Marius Thaulé for his assistance in the preparation of these proceedings.

Trondheim, Norway
 Oslo, Norway

Helge Holden
 Kenneth H. Karlsen

Nonlinear Partial Differential Equations

The Abel Symposium 2010

Holden, H.; Karlsen, K.H. (Eds.)

2012, XVI, 360 p., Hardcover

ISBN: 978-3-642-25360-7