

## Preface

The present volume is dedicated to Bernhard Ruf on the occasion of his sixtieth birthday. It contains articles by participants of the IX Workshop on Nonlinear Differential Equations, which took place at the Federal University of Paraíba in João Pessoa, Brazil in September 2012. The meeting belongs to a bilateral project between Brazil and Italy, which started in 1993 as an initiative of Bernhard Ruf and Carlo Pagani on the Italian side. From the beginning these events have been gathering mathematicians from all over the world.



*Bernhard Ruf*

Bernhard Ruf obtained his PhD in 1980 at the University of Zürich under the guidance of Peter Hess, and as a student he made his first contacts with the Brazilian community. His connections were intensified through the realization of a series of workshops, scientific collaborations and joint papers. On the side, he interlaced his research with scientists from several South American countries, USA, Canada, most European countries, India, China, Japan, Australia and Russia.

Since 1994, Bernhard has been Full Professor at the Università degli Studi di Milano, where he is a leading figure not only as a teacher and researcher, but also as an adviser of PhD students and supervisor of post-docs. His talent and dedication in mentoring young researchers is well known, and by now Bernhard has raised more than one generation of young mathematicians.

Bernhard has been director of the PhD School in Mathematics and the organizer of the Leonardo da Vinci Lectures since 1990, a series of conferences by worldwide recognized mathematicians. He is a director of three editions of the Riemann International School of Mathematics since 2009 and Founder and Managing Editor since 2002 of the Milan Journal of Mathematics, formerly edited as “Rendiconti del Seminario Matematico e Fisico di Milano”. He has participated in scientific and organizing committees of a number of international congresses and has been invited to deliver plenary lectures in major events.

Bernhard’s contribution to mathematics touches several fields of nonlinear analysis and partial differential equations systems combining methods from topology, geometry and analysis: singularity and bifurcation theory, where he obtained the remarkable and optimal result that an elliptic operator with cubic nonlinearity and a small linear term is a global cusp map between suitable Banach spaces; best embedding constants and the existence of extremals; lower-order perturbations; existence and nonexistence of solutions to related partial differential equations and systems; limiting cases in embedding inequalities, obtaining significant advances in the understanding of the lack of compactness in Trudinger–Moser type inequalities; periodic orbits of Hamiltonian systems, by means of a generalization of the famous Lyapunov center theorem; existence theorems for superlinear elliptic equations. His results appeared in more than eighty papers, most of which published in prestigious journals.

As recognition for his outstanding scientific career, in 2002, Bernhard has been appointed member of the Academy of Sciences and Letters “Istituto Lombardo”.

Analysis and Topology in Nonlinear Differential  
Equations

A Tribute to Bernhard Ruf on the Occasion of his 60th  
Birthday

de Figueiredo, D.G.; do Ó, J.M.; Tomei, C. (Eds.)

2014, X, 466 p. 17 illus., 6 illus. in color., Hardcover

ISBN: 978-3-319-04213-8

A product of Birkhäuser Basel