

# CONTEMPORARY MATHEMATICS

561

## Topics in Complex Analysis and Operator Theory

Third Winter School in  
Complex Analysis and Operator Theory  
February 2–5, 2010  
Universidad Politécnica de Valencia  
Valencia, Spain

Óscar Blasco  
José A. Bonet  
José M. Calabuig  
David Jornet  
Editors



American Mathematical Society  
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## Contents

Preface	v
List of participants	vii
Mini-courses	1
Notes on Real Analytic Functions and Classical Operators PAWEŁ DOMAŃSKI	3
Shining a Hilbertian lamp on the bidisk JOHN E. MCCARTHY	49
Selected problems in perturbation theory V.V. PELLER	67
Composition operators on Hardy-Orlicz spaces LUIS RODRÍGUEZ-PIAZZA	91
Articles	135
Remarks on weighted mixed norm spaces OSCAR BLASCO	137
Interpolation subspaces of $L^1$ of a vector measure and norm inequalities for the integration operator J.M. CALABUIG, J. RODRÍGUEZ, and E.A. SÁNCHEZ-PÉREZ	155
On the spectra of algebras of analytic functions DANIEL CARANDO, DOMINGO GARCÍA, MANUEL MAESTRE, and PABLO SEVILLA-PERIS	165
Holomorphic self-maps of the disk intertwining two linear fractional maps MANUEL D. CONTRERAS, SANTIAGO DÍAZ-MADRIGAL, MARÍA J. MARTÍN, and DRAGAN VUKOTIĆ	199
$ABC$ -type estimates via Garsia-type norms KONSTANTIN M. DYAKONOV	229
Volterra type operators on Bergman spaces with exponential weights JORDI PAU and JOSÉ ÁNGEL PELÁEZ	239



## Preface

This book contains the lecture notes of the courses as well as some invited papers presented during the *Third Winter School in Complex Analysis, Operator Theory and Applications* (<http://www.upv.es/entidades/3WSCAOT/indexc.html>). It was held in Valencia in February 2010. These articles give a careful and detailed introduction to some directions of research in Complex Analysis and Operator Theory. The book is divided into two different parts. The first part contains an extended self-contained version of the mini-courses taught at the School, and the second one collects several research papers with recent advances in the area and some survey articles of expository character.

The Winter School is one of the activities of the *Spanish Thematic Network Complex Variables, Function Spaces and Operators between Them* (<http://www.uma.es/investigadores/grupos/cfunspot/>). This network is an official organization financed by the Ministry of the central Government of Spain with approximately 70 researchers from 14 Spanish Universities, who are experts in Complex Analysis and Operator Theory. The main lines of research of the members of the network are the following:

- Classical theory of spaces of analytic functions.
- Operators between spaces of analytic functions.
- Other function spaces: Spaces of vector valued analytic functions.
- Geometric function theory.
- Riemann surfaces, Gromov hyperbolicity.
- Approximation theory.
- Dynamical systems.
- Geometry of Banach spaces.

Since 2006, every second year a Winter School is organized by a different group of the research network. The aim is that active researchers from Spanish and international Universities share their ideas and learn about new directions and problems in Complex Analysis and Operator Theory. The first *Winter School of the Spanish Thematic Network* was held in Antequera (Málaga, Spain), from the 5th to the 9th of February of 2006 (<http://webpersonal.uma.es/~GIRELA/winter.school.02-05.html>), and the next one in Sevilla (Spain) from the 5th to the 9th of February of 2008 (<http://congreso.us.es/wscat/>). The present book contains the Proceedings of the *Third Winter School in Complex Analysis, Operator Theory and Applications*, which took place in Valencia (Spain) from the 2nd to the 5th of February of 2010. This event was attended by approximately 70 participants from different countries.



This third edition of the Winter School consisted of four courses of four hours each, nine invited talks of one hour, a poster session and an “open problem” session. The School was organized with the aim of providing an extensive overview of some of the main current topics of research in complex analysis, spaces of analytic functions, operators acting between them and connections with other areas. The courses were addressed to young researchers in the area as well as to post-doc and senior researchers.

The editors would like to thank everyone who, in a direct or indirect way, has participated in these Proceedings: the authors, the referees, the sponsoring institutions (Ministerio de Educación y Ciencia, Universidad Politécnica de Valencia, Universidad de Valencia, Project Ingenio Mathematica, “Harmonic and Complex Analysis and its Applications” Thematic Network of the European Science Foundation, Instituto Universitario de Matemática Pura y Aplicada and Generalitat Valenciana) and, last but not least, the publishing staff of both the American Mathematical Society and the Real Sociedad Matemática Española for their great help.

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This book contains the lecture notes as well as some invited papers presented at the Third Winter School in Complex Analysis, Operator Theory and Applications held February 2–5, 2010, in Valencia, Spain.

The book is divided into two parts. The first is an extended self-contained version of the mini-courses taught at the School. The papers in this first part are: *Notes on real analytic functions and classical operators*, by Pawelstrok Domański; *Shining a Hilbertian lamp on the bidisk*, by John E. McCarthy; *Selected problems in perturbation theory*, by Vladimir V. Peller; and *Composition operators on Hardy–Orlicz spaces*, by Luis Rodríguez-Piazza.

The second part consists of several research papers on recent advances in the area and some survey articles of an expository character. The articles in this second part are: *Remarks on weighted mixed norm spaces*, by O. Blasco; *Interpolation subspaces of  $L^1$  of a vector measure and norm inequalities for the integration operator*, by J.M. Calabuig, J. Rodríguez and E.A. Sánchez-Pérez; *On the spectra of algebras of analytic functions*, by D. Carando, D. García, M. Maestre and P. Sevilla-Peris; *Holomorphic self-maps of the disk intertwining two linear fractional maps*, by M.D. Contreras, S. Díaz-Madrigal, M.J. Martín and D. Vukotić; *ABC-type estimates via Garsia-type norms*, by K.M. Dyakonov; and *Volterra type operators on Bergman spaces with exponential weights*, by J. Pau and J.A. Peláez.

The topics selected for the mini-courses cover several aspects of complex analysis and operator theory that play important roles in understanding connections between different areas that are considered in fashion these days. This part is aimed at graduate students and young researchers. The courses are self-contained, focusing on those aspects that are basic and that can lead the readers to a quick understanding of the theories presented in each topic. They start with the classical results and reach a selection of open problems in each case. The research and survey articles are aimed at young researchers in the area, as well as post-doc and senior researchers interested in complex analysis and operator theory.

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