CONTEMPORARY MATHEMATICS

612

Harmonic Analysis and Partial Differential Equations

9th International Conference on
Harmonic Analysis and Partial Differential Equations
June 11–15, 2012
El Escorial, Madrid, Spain

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José García-Cuerva
Gustavo Garrigós
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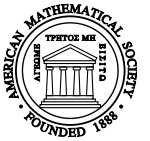

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Introduction

This volume contains the Proceedings of the 9th International Conference on Harmonic Analysis and Partial Differential Equations, which took place in El Escorial, Madrid (Spain) during the week June 11–15, of 2012.

The celebration of this El Escorial 2012 Conference continues a tradition, initiated in 1979, thanks to the leadership and enthusiasm of Professor Miguel de Guzmán. The purpose of that first Conference was to bring together the best mathematicians in the field and let them show the progress in the area to a wide audience of senior and, most importantly, young researchers. The success of the El Escorial 1979 Conference, which, among the main speakers, included Alberto Calderón, Ronald Coifman, Yves Meyer and Peter Jones, inspired a group of people in the Department of Mathematics of the Universidad Autónoma de Madrid to continue to hold an International Conference with the same aim about every four years. From that first Conference in 1979, another eight have been held, in 1983, 1987, 1992, 1996, 2000, 2004, 2008 and 2012. The El Escorial Conferences have kept growing in size and impact and are now very highly valued and anticipated mathematical events that take place every olympic year.

The format of these Conferences has always been essentially the same and it has established a model that counts with general approval within the mathematical community and is now followed by many conferences in different fields of Mathematics all over the world. Four outstanding mathematicians in the field of Harmonic Analysis and Partial Differential Equations are invited to teach a mini-course each. These mini-courses are intended to present in three or four one-hour sessions the state of the art in some topic of current interest, assuming minimal background from the audience, and reaching the level of present day research in such a way as to be very useful for young researchers who are trying to join those teams that are doing original work of high quality. Another important part of the Conference consists of some 15 to 20 invited one-hour lectures that can be of a more specialized nature. Finally, some few sessions of short talks are scheduled to provide an opportunity for those participants who want to present their latest results.

These Proceedings contain the written version of one of the four mini-courses given at this year's Conference, namely, that of Jonathan Bennett on "Aspects of multilinear Harmonic Analysis related to transversality" and also the paper by Emmanouil Milakis, Jill Pipher, and Tatiana Toro entitled "Perturbations of elliptic operators on chord-arc domains", which reflects and extends the mini-course delivered at the Conference by Tatiana Toro entitled "Analysis on non-smooth domains". Detlef Müller and Joan Verdera, who also gave mini-courses at the Conference, did not submit written versions because the content of their courses, which dealt, respectively with "Aspects of Harmonic Analysis related to hypersurfaces and

Newton diagrams" and "Estimating the maximal singular integral by the singular integral" had already been published elsewhere.

Also in these Proceedings one can find the contributions of most of the other invited speakers, eight out of fourteen, to be precise. The topics of these Contributed Lectures cover a wide range in the field of Harmonic Analysis and Partial Differential Equations and illustrate very well the fruitful interplay between the two subfields.

The Proceedings of all the El Escorial Conferences have been published in different Mathematical journals of wide circulation. We consider the publication of the Proceedings as an essential part of the Conference, the very final act and the starting point of the process to prepare the next El Escorial Conference. On this occasion, we want to thank the American Mathematical Society for its help to get the Proceedings of El Escorial 2012 published in its collection "Contemporary Mathematics". It is also proper to thank the institutions which have helped financially with the organization of El Escorial 2012, namely: the Spanish Ministry of Economía and Competitividad, the Universidad Autónoma de Madrid, the Instituto de Ciencias Matemáticas (CSIC-UAM-UC3M-UCM) through its "Excelencia Severo Ochoa" project and the Real Sociedad Matemática Española. The next El Escorial Conference will be held in 2016.

The Organizing Committee
Madrid, July 2013

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This volume contains the Proceedings of the 9th International Conference on Harmonic Analysis and Partial Differential Equations, held June 11–15, 2012, in El Escorial, Madrid, Spain.

Included in this volume is the written version of the mini-course given by Jonathan Bennett on *Aspects of Multilinear Harmonic Analysis Related to Transversality*. Also included, among other papers, is a paper by Emmanouil Milakis, Jill Pipher, and Tatiana Toro, which reflects and extends the ideas presented in the mini-course on *Analysis on Non-smooth Domains* delivered at the conference by Tatiana Toro.

The topics of the contributed lectures cover a wide range of the field of Harmonic Analysis and Partial Differential Equations and illustrate the fruitful interplay between the two subfields.

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