

## Introduction

We present in this volume the Proceedings of the 6th International Conference on Harmonic Analysis and Partial Differential Equations, which took place in El Escorial, Spain, during the first week of July, 2000.

This is a continuation of a series of Conferences organized by members of the Department of Mathematics at Universidad Autónoma de Madrid. The “El Escorial Meetings”, as they are known, began in 1979 under the direction of Professor Miguel de Guzmán. The idea behind was that of putting together the finest mathematicians in this field and let them show the state of the art to a wide audience of people formed by both young and senior researchers. This first Conference was followed by other editions in 1983, 1987, 1992 and 1996. We are proud to have helped to keep with this tradition and to present here the resulting work of the 6th edition. In this occasion the Conference was linked, as a satellite workshop, to the 3rd European Congress of Mathematicians held in Barcelona in July, 2000.

The format of these Conferences has always been the same and it has had generalized approval among the mathematical community. 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 3 or 4 one-hour sessions a rich and actual piece of mathematics assuming minimal background from the audience and reaching the frontiers of present day research. They are thought primarily for young people who are starting their graduate work or for mathematicians in other areas who want to become acquainted with the field. Other important part of the Conference consists of some 15 to 20 invited one-hour lectures which tend to be of a more specialized nature. Finally, some sessions of short talks are scheduled to accommodate those participants wishing to present very recent results.

These Proceedings contain the written versions of two of the four mini-courses given this time at the Conference, the one by Andreas Seeger dealing with “Fourier Integral Operators with degeneracies” and the one by Christoph Thiele on “Multilinear Singular Integrals”. They also contain contributions from most of the other invited speakers. The topics of these Contributed Lectures cover a wide range of the field of Harmonic Analysis and Partial Differential Equations and illustrate very well the fruitful interplay between the two subfields.

We would like to acknowledge the financial support of the following institutions: Universidad Autónoma de Madrid (Vicerrectorado de Investigación) and D.G.E.S. (Ministerio de Educación, Cultura y Deporte). Their continuous support throughout this and the previous Conferences has been essential for the success of the meeting. In this occasion we also benefited from the support of the European Commission, via the Training and Mobility of Researches Network “Harmonic Analysis”. We are also thankful to the Editors of Publicacions Matemàtiques for their acceptance to publish this special volume as part of the Journal series.

Our special thanks go, above all, to the speakers in the meeting. Their positive response to our invitation to participate was overwhelming and simplified tremendously the organization of the conference. Finally, we believe that the organization of this Conference would not have been possible without the support of the many participants who attended the meeting. The success of this and of the previous El Escorial Conferences is due in part to the enthusiasm and good atmosphere always present both at the conference room and elsewhere. We thank all of them and we look forward to see them in the next edition.

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