

CIMPA SCHOOL 2008
REAL ANALYSIS AND ITS APPLICATIONS
ARGENTINA
SCIENTIFIC REPORT

1. INTRODUCTION

The School was held at La Falda, Córdoba, Argentina; between May 26 and June 6.

During the meeting six five hour courses and fourteen conferences were delivered . The first week was mainly devoted to Partial Differential Equations and related topics, while in the second one the emphasis was on Harmonic Analysis and its applications. Besides during those two weeks we had twelve short talks in charge of young researchers or graduate students.

Along the courses as well as in the conferences and short talks quite recent developments of Analysis and its applications were presented.

The main goal of the conference, bringing together graduate students from different local universities with prestigious researchers, was fully achieved. Even during free time people got together in the lounge or in other parts of the hotel to discuss mathematics in a relax and comfortable environment.

Links between researchers and students close to graduation or recently graduate were established. Moreover plans for future encounters, academic visits and thesis direction were formulated.

2. ACADEMIC PROGRAM

Courses:

- **Q1:** Luis Caffarelli (University of Texas at Austin, USA): Non-linear problems involving fractional powers of the Laplacian. (Q1)
- **Q2:** Aline Bonami (Université d'Orléans, France): Some applications of Calderón-Zygmund theory to Hankel and Toeplitz operators.
- **Q3:** Oscar Blasco de la Cruz (Universidad de Valencia, Spain): Bilinear Hilbert transform and other multipliers. Transference and applications.
- **Q4:** Sundaram Thangavelu (Indian Institute Of Science, Bangalore, India): Harmonic analysis on Heisenberg nilmanifolds.
- **Q5:** Jacek Dziubanski (Wroclaw University, Poland): Harmonic analysis associated with certain semigroups of linear operators.
- **Q6:** Carlos Pérez Moreno (Universidad de Sevilla, Spain): Applications of real and complex analysis to commutators of BMO functions with singular integrals and general linear operators.

Conferences:

C1: Mixed weak type inequalities for one-side operators. Francisco Martín-Reyes. *Universidad de Málaga – Spain.*

C2: On a nonlocal class of harmonic functions. Manuel Elgueta. *Pontificia Universidad Católica de Chile - Chile*

C3: Atomic decompositions and operators on Hardy spaces. Peter Sjögren. *University of Gothenburg - Sweden*

- C4: Optimal Non-Linear Models for Sparsity and Sampling. Ursula Molter. *Universidad de Buenos Aires – Argentina.*
- C5: Multi-Parameter Riesz Commutators. Michael Lacey. *Georgia Institute of Technology - United States*
- C6: Bump lines in \mathbb{R}^2 . Manuel del Pino. *Departamento de Ingeniería Matemática and CMM, Universidad de Chile - Chile*
- C7: Generalized Gelfand pairs associated to groups of Heisenberg type. Linda Saal. *Universidad de Córdoba- Argentina*
- C8: One-sided analysis and regularity of temperatures. Hugo Aimar. *Universidad del Litoral - IMAL - Argentina*
- C9: New maximal functions, commutators, and weighted estimates for the multilinear. Calderón-Zygmund theory. Rodolfo Torres. *University of Kansas - United States*
- C10: Finsler geometry and actions of the p -Schatten unitary groups. Esteban Andruchow. *Universidad General Sarmiento - Argentina*
- C11: Persistence of odometers in topological dynamical systems. Udayan Darji. *University of Louisville - United States*
- C12: A characterization of radial multipliers in $L_p(\text{rad})$. Gustavo Garrigós. *Universidad Autónoma de Madrid - Spain*
- C13: Transference between Laguerre and Hermite settings. Jorge Betancor. *Universidad de La Laguna - Spain*
- C14: Gelfand transforms of K -invariant Schwartz functions on the Heisenberg group. Fulvio Ricci. *Scuola Normale Superiore di Pisa - Italy*

Short talks:

- ST1: L^p self-improving properties of generalized Poincaré inequalities associated with approximations of the identity. Ana Jimenez del Toro. *Universidad Autónoma de Madrid-Spain.*
- ST2: A fractal Plancherel theorem. Leandro Zuberhmann. *Universidad de Buenos Aires-Argentina.*
- ST3: Relations between bilinear multiplier on \mathbb{R} , \mathbb{T} and \mathbb{Z} . Saurabh Kumar Shrivastava. *Indian Institute of Technology Kanpur- India.*
- ST4: Gaussian spaces of differentiable functions. Iris Lopez. *Universidad Simón Bolívar-Venezuela*
- ST5: Sobolev spaces associated with ultraspherical expansions. Ricardo Testoni. *Universidad Nacional del Sur-Argentina.*
- ST6: Completeness of Muckenhoupt classes. Marilina Carena. *Universidad Nacional del Litoral. Argentina.*
- ST7: Explicit localization estimates for spline-type spaces. José Luis Romero. *Universidad de Buenos Aires-Argentina.*
- ST8: Convolution of self-conformal measures. Ignacio García. *Universidad Nacional del Litoral- Argentina.*
- ST9: T1 Theorem in spaces of homogeneous type, for functions valued in a Hilbert space. Pablo Viola. *Universidad Nacional del Litoral- Argentina.*
- ST10: End-point estimates for commutators of multilinear singular operators. Rodrigo Trujillo. *Universidad de La Laguna-Spain.*

ST11: Oscillation and ρ -variation operators between maximal operators and singular integrals. Raquel Crescimbeni. *Universidad Nacional del Comahue-Argentina*.

ST12: Small Ball Inequality. Michael Lacey. *Georgia Institute of Technology - United States*

Timetable Cimpa 2008

FIRST WEEK

Time	Mon 26	Tue 27	Wed 28	Thu 29	Fri 30
9:00-10:00		Q1 (*)	Q1 (*)	Q1 (*)	Q1 (*)
10.15-11:00		C1	C3	C4	C6
11:00-11:30	Registration	Coffee break	Coffee break	Coffee break	Coffee break
11:30-12:30	Registration	C2		C5	C7
13:00-14 :45	Lunch	Lunch	Lunch	Lunch	Lunch
14:45-15:00	Welcome words				
15:00-16:00	Q2		Q2	Q2	Q2
16:30-17:30	Q3	Q3	Q3	Q3	Q3
17:30-18:00	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
18:00-18:20	Q1 (*)	Q2	ST1	ST4	C8
18:20-18:40			ST2	ST5	
18:40-19:00			ST3	ST6	

SECOND WEEK

Time	Mon 2	Tue 3	Wed 4	Thu 5	Fri 6
9 :00-10:00	Q4 (*)	Q4 (*)	Q4 (*)	Q4 (*)	Q4 (*)
10:30-11:30	Q5	Q5	Q5	Q5	Q6
11:30-12:00	Coffee break	Coffee break	Coffee break	Coffee break	Goodbye toast
12:00-13:00	Q6	Q6	Q6	Q6	
13:00-15:30	Lunch	Lunch	Lunch	Lunch	
16:30-16:50	ST7 (*)	ST10 (*)	C11 (*)	Q5	
16:50-17:10	ST8 (*)	ST11 (*)			
16:10-17:30	ST9 (*)	ST12 (*)			
17:30-18:00	Coffee break	Coffee break	Coffee break	Coffee break	
18:00-18:45	C9 (*)	C9 (*)	C13 (*)	C14	

(*): Joint activity with Encuentro de Analistas

SOCIAL EVENTS:

Friday May 30: Music and dancing.

Saturday May 31: Outing to Los Terrones.

Sunday June 1: Córdoba city tour.

Tuesday June 3: Special dinner: cabrito a las brasas.

3. PARTICIPANTS

The number of participants was around one hundred coming from Chile, Ecuador, Venezuela, Colombia , Brazil , Mexico, India, Spain, Italy, France, Sweden, USA, Poland, Argentina

Below we give a description of the distribution of the participants according to the country of origin and seniority

Country	Graduate Student	Post-Doc	Researcher
Argentina	25	8	32
Brazil	2	0	0
Chile	0	0	2
Colombia	2	0	1
Ecuador	1	0	0
France	0	0	1
India	1	0	1
Italy	0	0	1
Mexico	1	0	0
Poland	0	0	1
Spain	2	0	6
Sweden	0	0	1
United States	0	0	4
Venezuela	4	1	0
Total	38	9	50

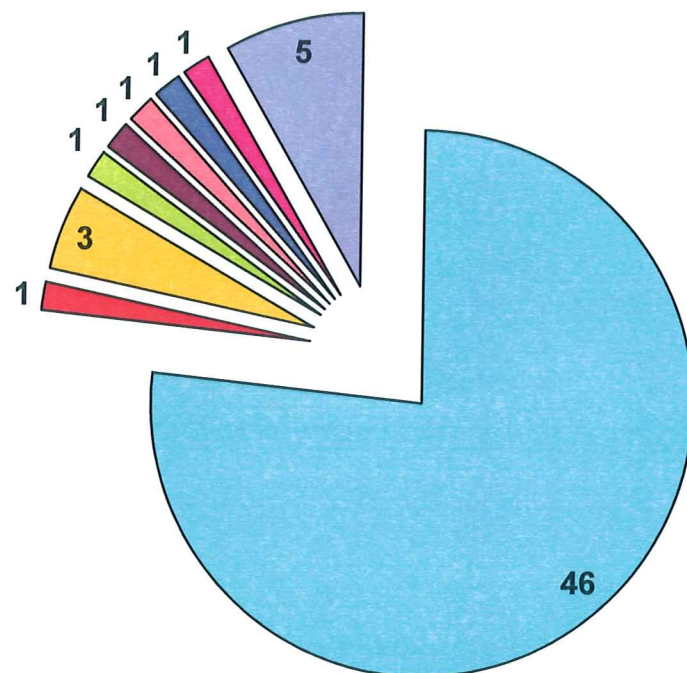
We also include a complete list of participants of the School

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Répartition par nationalité des participants à l'école
"Analyse réelle et ses applications"
Cordoba (Argentine), Mai-Juin 2008



■ ARGENTINE	46
■ BOLIVIE	1
■ BRESIL	3
■ COLOMBIE	1
■ EQUATEUR	1
■ ESPAGNE	1
■ INDE	1
■ MEXIQUE	1
■ VENEZUELA	5
TOTAL = 60	