1. Academic Report

This school gathered students and young scientists, as well as experts working in the area of Harmonic Analysis and Geometric Measure Theory, both, from the theoretic, as well as the applied point of view.

There has been a high participation of recent PhD.'s, Ph.D. students and students following a master's degree. These students came from all over the world, mainly from Argentina (40) (Buenos Aires, Entre Ríos, Mar del Plata, Santa Fe and other Argentinean universities), and neighboring countries (Brazil, Chile, Colombia, Cuba, Perú, México, Venezuela) (12) but also from Europe (6), India (2) and the US (1). (For a complete list see the attached participant list.)

The event took place at the University of Buenos Aires, Faculty of Sciences campus, in the city of Buenos Aires, between July 31st and August 11th of 2017. Students had the possibility to stay in Dormitories of the University, right on campus, and the speakers and general participants were accommodated in hotels nearby. The topics covered in this meeting were Harmonic Analysis, Geometric Measure Theory, wavelets, and applications of this field such as signal and image processing.

There were essentially two parts to the school:
1) 6 courses plus an introductory one
2) 29 lectures on recent developments and breakthroughs.

There were two poster sessions, one in each week respectively, with about 30 poster presentations. Since the posters were exhibited close to the venue, participants could read them during almost the whole conference.

One very nice addition to the school, was the conference on "Wavelets and Gravitational Waves" delivered by Stéphane Jaffard, which illustrated how wavelets have been fundamental to detect gravitational waves.

The school provided a unique learning opportunity for young researchers, especially from Latin America, in several recent and important developments in applications. It will help to create future researchers in mathematics and in signal and image processing in this part of the world.

It also generated contacts between scientists for the update on research topics and the creation of future common projects. As two examples, one of the student participants of Venezuela (Alejandra Aguilera) is applying for a doctoral fellowship to pursue her PhD. at the UBA, and another student from Brazil (Mateus Sousa) is applying for a Postdoctoral position at the UBA, within the Harmonic Analysis and Fractal Geometry group.

The website for the event can be found at **http://cms.dm.uba.ar/actividades/congresos/cimpa2017**.

2. Program

- Courses

- **Massimo Fornasier** (Technische Universität München, Germany)
- **Karl-Heinz Gröchenig** (Universität Wien, Austria) *Gabor analysis: applications, theory, and mysteries*
- **Stéphane Jaffard** (Université Paris-Est Créteil Val de Marne, France) *Multifractal analysis based on wavelet bases: Part 1. Mathematical foundations and p-leaders analysis*
- **Pertti Mattila** (University of Helsinki, Finland) *The Fourier transform and Hausdorff dimension*
- **Maria Cristina Pereyra** (University of New Mexico, USA) *Dyadic harmonic analysis and weighted inequalities*
- **Pablo Shmerkin** (Universidad Torcuato Di Tella, Argentina) *From additive combinatorics to geometric measure theory*
- **Xavier Tolsa** (Universidad Autónoma de Barcelona, Spain) *The Riesz transform, rectifiabilty, and harmonic measure*
- **Herwig Wendt** (Institut de Recherche en Informatique de Toulouse, France) *Multifractal analysis based on wavelet bases: Part 2. Estimation, Bayesian models and multivariate data*

- Plenary Speakers

- **Patrice Abry** (École Normale Supérieure. Lyon, France) *Multivariate Self-similarity: Multiscale eigen structures for the estimation of Hurst exponents.*
- **John Benedetto** (University of Maryland, USA) *Frames and some algebraic forays.*
- **Jorge Betancor** (Universidad de la Laguna, Spain) *Hardy spaces with variable exponents.*
- **Luis Caffarelli** (University of Texas, USA) *A problem of interacting obstacles.*
- **Emanuel Carneiro** (IMPA, Brazil) *Regularity theory for maximal operators - an overview.*
- **Maria Charina** (Universität Wien, Austria) *Regularity of refinable functions: matrix approach.*
- **Marianna Csornyei** (University of Chicago, USA) *The Kakeya needle problem for rectifiable sets.*
- **Laura De Carli** (Florida International University, USA) *Many questions and few answers on exponential bases.*
- **Maarten de Hoop** (Rice University, USA) *Frame-based multi-scale Gaussian beams, wavefield approximation and boundary value problems.*
- **Ricardo Durán** (Universidad de Buenos Aires, Argentina) *Improved Poincaré inequalities in fractional Sobolev spaces.*
- **Patrick Flandrin** (École Normale Supérieure. Lyon, France) *The sound of silence — Recovering signals from time-frequency zeros.*

- **Karl-Heinz Gröchenig** (Universität Wien, Austria) *What is variable bandwidth?*
- **Chris Heil** (Georgia Institute of Technology, USA) *Wavelets, Self-Similarity, and the Joint Spectral Radius: A Retrospective.*
- **Eleonor Harboure** (IMAL - CONICET, Argentina) *Local Calderón-Zygmund theory on proper open subsets.*
- **Eugenio Hernández** (Universidad Autónoma de Madrid, Spain) *Greedy algorithm and embeddings.*
- **Alex Iosevich** (University of Rochester, USA) *Finite point configurations: analysis, combinatorics and number theory.*
- **Stéphane Jaffard** (Université Paris-Est Créteil Val de Marne, France) *Wavelets on the hunt for gravitational waves.*
- **Tamas Keleti** (Eötvös Loránd University (ELTE), Hungary) *Hausdorff dimension of unions of subsets of lines or k-planes.*
- **Mihalis Kolountzakis** (University of Crete, Greece) *Measurable Steinhaus sets do not exist for finite sets or the integers in the plane.*
- **Roberto Leonarduzzi** (Université Paris Est Créteil, France) *p-leader analysis and classification of oscillating singularities.*
- **Irene Martínez Gamba** (University of Texas, USA) *Existence and uniqueness theory for binary collisional kinetic models.*
- **Clothilde Melot** (Université Aix Marseille, France) *Intertwining wavelets or multiresolution analysis on graphs through random forests.*
- **Shahaf Nitzan** (Georgia Institute of Technology, USA) *The Balian-Low theorem in the finite dimensional setting.*
- **Sheldy Ombrosi** (Universidad Nacional del Sur, Argentina) *Weighted endpoint estimates for commutators of Calderón-Zygmund operators.*
- **Carlos Perez** (BCAM, Spain) *Borderline weighted estimates for the maximal function and for rough singular integral operators.*
- **José Luis Romero** (Acoustics Research Institute, Austria) *Sharp sampling density conditions for shift-invariant spaces.*
- **Ville Suomala** (University of Oulu, Finland) *Patterns in random fractals.*
- **Rodolfo Torres** (University of Kansas, USA) *Smoothing properties of bilinear operators and Leibniz-type rules.*
- **Yimin Xiao** (Michigan State University, USA) *Fine Properties of Gaussian Random Fields on the Sphere.*

3. Program

CIMPA2017 Research School - Harmonic Analysis, Geometric Measure Theory and Applications
Buenos Aires, July 31 - August 11, 2017

PROGRAM Week 1

Time	Monday 31	Tuesday 1	Wednesday 2	Thursday 3	Friday 4	Saturday 5
9:00	Registration	Jaffard	Fornasier	Fornasier	Fornasier	
						Benedetto UM2017 (9:40)
10:20		Coffee Registration	Coffee	Coffee	Coffee	Caffarelli UM2017 (10:20)
10:50		Mattila	Mattila	Mattila	Betancor / Q: 10 min	Coffee (11:00)
11:40	Jaffard				Kolountzakis / Q: 10 min	Martinez Gamba UM2017 (11:30)
12:10		Break	Break	Break	Break	Harboure UM2017 (12:00)
		Nitzan / Q: 10 min	Flandrin / Q: 10 min	Charina / Q: 10 min	Xiao / Q: 10 min	Aldroubi UM2017 (12:30)
13:00	Lunch	Lunch	Lunch	Lunch	Lunch	
13:30						Special LUNCH for the celebration In Rodizio Costanera Norte nearby the school
14:00	Registration				Registration	
14:40					Wolanski (14:50)	
	Gröchenig	Gröchenig		Gröchenig	Jaffard UM2017 (15:20)	
					Hernandez UM2017	
15:50					Break	
16:00	Coffee Registration	Coffee	Coffee	Coffee	Heil UM2017 (16:30)	
16:30	Wendt	Wendt		Wendt	Ombrosi UM2017 (17:00)	
17:30					Coffee	
					Duran UM2017 (18:00)	
17:50	Opening	Poster Session		Break	Photos UM2017	
18:00				Santaló Lecture Benedetto (19:00)		
19:30						

PROGRAM Week 2

Time	Monday 7	Tuesday 8	Wednesday 9	Thursday 10	Friday 11
9:00	Pereyra	Pereyra	Pereyra	Tolsa	Tolsa
10:20	Coffee Registration	Coffee	Coffee	Coffee	Coffee
10:50	Shmerkin	Shmerkin	Tolsa	Shmerkin	Romero / Q: 10 min
11:30					Gröchenig / Q: 10 min
12:10	Break	Break	Break	Break	Break
	Csornyei / Q: 10 min	Iosevich / Q: 10 min	Carneiro / Q: 10 min	Keleti / Q: 10 min	Perez / Q: 10 min
13:00					Closing
	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
15:00	de Hoop / Q: 10 min	De Carli / Q: 10 min		Abry / Q: 10 min (15:40)	
16:10	Coffee	Coffee		Coffee	
16:50	Melot / Q: 10 min	Leonarduzzi / Q: 10 min		Torres / Q: 10 min	
17:10		CIMPA presentation Jorge Jiménez		Suomala / Q: 10 min (17:30)	
		Poster Session			
18:30					

| 20:30 | Social Dinner |

4. Participants

	Name	Affilitaion	Country	Gender
1	Abry, Patrice	École Normale Supérieure	France	M
2	Accomazzo Scotti, Natalia	UPV/EHU	Spain	F
3	Acinas, Sonia	National University of La Pampa	Argentina	F
4	Agora, Elona	IAM, CONICET	Argentina	F
5	Aguilera Aguilera, Alejandra Patricia	Universidad Central de Venezuela	Venezuela	F
6	Aldroubi, Akram	Vanderbilt University	USA	M
7	Almeida Gomez, Alvaro	Instituto Nacional de Matemática Pura e Aplicada IMPA	Brazil	M
8	Almeida Lozano, Víctor Manuel	Universidad de La Laguna	Spain	M
9	Antezana, Jorge	Universidad Nacional de La Plata, IAM- CONICET	Argentina	M
10	Arouxét, María Belén	Universidad Nacional de La Plata	Argentina	F
11	Bammer, Roswitha	Faculty of Mathematics / University of Vienna	Austria	F
12	Benac, María José	IAM - CONICET, FCE - UNLP, FCEyT - UNSE	Argentina	F
13	Benedetto, John	Norbert Wiener Center, U. of Maryland - College Park	USA	M
14	Betancor, Jorge	Universidad de La Laguna	Spain	M
15	Cabrelli, Carlos	Universidad de Buenos Aires, IMAS-CONICET	Argentina	M
16	Calderon, Pablo	UNLP - IAM	Argentina	M
17	Carbajal, Diana Agustina	Universidad de Buenos Aires	Argentina	F
18	Cardeccia, Rodrigo	UBA	Argentina	M
19	Carneiro, Emanuel	IMPA - Rio de Janeiro	Brazil	M
20	Cejas, Maria Eugenia	Universidad Nacional de La Pata - CONICET	Argentina	F
21	Centeno, Hernan	UBA	Argentina	M
22	Chang, Alan	U. Chicago	USA	M
23	Charina, Maria	Universität Wien	Austria	F
24	Chirre Chávez, Carlos Andrés	Instituto de Matemática Pura y Aplicada	Brazil	M
25	Correa Hoyos, Julio César	Universidade de Sao Paulo	Brazil	M
26	Cruz Barriguete, Victor Alberto	Universidad Autónoma Metropolitana	Mexico	M
27	Cruz Ramirez, Joel	Universidade Federal de Minas Gerais (UFMG) - Brasil	Brazil	M
28	Csornyei Marianna	University of Chicago	USA	F
29	Dalmasso, Estefanía Dafne	CONICET -UNL	Argentina	F
30	De Carli Laura	Florida International University	USA	F
31	De Hoop Martin	Rice University	USA	M
32	De Nápoli, Pablo	UBA - IMAS (Conicet)	Argentina	M
33	De Pasquale, Horacio Alberto	UNMdP	Argentina	M
34	Del Pezzo, Leandro	CONICET UTDT	Argentina	M
35	Diaz Martin, Rocío Patricia	FAMAF - UNC	Argentina	F
36	Díaz Sepúlveda, Pablo	IME- São Paulo University	Brazil	M

	Asdrúbal			
37	**Durán, Ricardo**	Universidad de Buenos Aires	Argentina	M
38	**Escudero, Luis Alberto**	UBA	Argentina	M
39	**Fernandez Melchor, Ivan**	Universidad Nacional de Río Negro	Argentina	M
40	**Flandrin Patrick**	École Normale Supérieure	France	M
41	**Fornassier Massimo**	Technische Universität Munchen	Germany	M
42	**Galli, Vanesa**	UNMdP	Argentina	F
43	**Garcia, Ignacio**	Universidad Nacional de Mar del Plata	Argentina	M
44	**García, María Guadalupe**	UNLP, IAM-CONICET	Argentina	F
45	**Garcia, Nahuel**	UBA	Argentina	M
46	**Ghiglioni, Eduardo**	Instituto Argentino de Matematica	Argentina	M
47	**Gómez, Ivana**	IMAL	Argentina	F
48	**Groechenig Karl Heinz**	Universität Wien	Austria	M
49	**Guzmán Fonseca, Oscar Maurio**	Universidad Nacional de Colombia	Colombia	M
50	**Harboure, Eleonor**	IMAL (CONICET-UNL y FIQ (UNL)	Argentina	F
51	**Heil, Christopher**	Georgia Tech	USA	M
52	**Heineken, Sigrid**	IMAS, UBA-CONICET	Argentina	F
53	**Hernandez, Eugenio**	Universidad Autónoma de Madrid	Spain	M
54	**Ibañez Firnkorn, Gonzalo Hugo**	CIEM-CONICET, FaMAF-UNC	Argentina	M
55	**Iosevich Alex**	University of Rochester	USA	M
56	**Jaffard Stephane**	Université Paris-Est Créteil Val de Marne	France	M
57	**Keleti Tamas**	Eötvös Loránd University (ELTE)	Hungary	M
58	**Kolountzakis Mihalis**	University of Crete	Greece	M
59	**Kovac, Federico Dario**	Universidad Nacional de La Pampa	Argentina	M
60	**Leonarduzzi Roberto**	Université Paris Est Créteil	France	M
61	**Luna Núñez, Erick David**	Universidad Autónoma de Aguascalientes	Mexico	M
62	**Mansilla, Martin**	UBA - CONICET	Argentina	M
63	**Martínez Pería, Francisco**	IAM-CONICET & Universidad Nacional de La Plata	Argentina	M
64	**Massey, Pedro**	UNLP & IAM-CONICET	Argentina	M
65	**Mattila, Pertti**	University of Helsinki	Finland	M
66	**Medri, Ivan Vladimir**	FAMAF, Universidad Nacional de Córdoba	Argentina	M
67	**Melot, Clothilde**	Université Aix Marseille	France	F
68	**Milne, Leandro Agustin**	FaMAF, Universidad Nacional de Córdoba	Argentina	M
69	**Molter, Ursula**	Departamento de Matematica, UBA/IMAS CONICET	Argentina	F
70	**Morana, Federico**	IMAL	Argentina	M
71	**Mosquera, Carolina Alejandra**	Universidad de Buenos Aires - IMAS, CONICET	Argentina	F
72	**Muller, Pamela**	UNS	Argentina	F
73	**Negreira, Felipe**	Université de Bordeaux	France	M
74	**Nitzan Shahaf**	Georgia Institute of Technology	USA	F
75	**Oliveira, Lucas**	Department of Pure and Applied Mathematics / UFRGS	Brazil	M
76	**Olivo, Andrea**	Universidad de Buenos Aires	Argentina	F

77	Paternostro, Victoria	Universidad de Buenos Aires	Argentina	F
78	Pereyra Maria Cristina	University of New Mexico	USA	F
79	Perez Carlos	BCAM	Spain	M
80	Pulido Vasquez, Jessica	Universidad Distrital Francisco Jose de Caldas	Colombia	F
81	Quijano, Pablo	IMAL - UNL - CONICET	Argentina	M
82	Quintero, Alejandro	Universidad Nacional de Mar del Plata	Argentina	M
83	Quispe Mamani, Santiago Miler	Universidade de Brasília	Brazil	M
84	Rela, Ezequiel	Universidad de Buenos Aires	Argentina	M
85	Rios, Noelia Belén	UNL - IAM CONICET	Argentina	F
86	Rivera Ríos, Israel Pablo	Universidad de Sevilla	Spain	M
87	Rodríguez López, Hanzel	ICIMAF (Instituto de Cibernética, Matemática y Física)	Cuba	M
88	Romero José Luis	Acoustics Research Institute / Austrian Academy of Sciences	Austria	M
89	Rosenblatt, Mariel	UNGS	Argentina	F
90	Rossi, Eino	UTDT	Finland	M
91	Ruiz, Mariano	IAM-CONICET & Universidad Nacional de La Plata	Argentina	M
92	Sengupta, Banhirup	University of Verona	Italy	M
93	Shmerkin, Pablo	Torcuato Di Tella University	Argentina	M
94	Sousa, Mateus	IMPA	Brazil	M
95	Speckbacher, Michael	Acoustics Research Institute / Austrian Academy of Sciences	Austria	M
96	Stojanoff, Demetrio	IAM & UNLP	Argentina	M
97	Suomala Ville	University of Oulu	Finland	M
98	Testoni, Ricardo	Universidad Nacional del Sur	Argentina	M
99	Tolsa Xavier	Universidad Autónoma de Barcelona	Spain	M
100	Torres, Rodolfo H.	University of Kansas	USA	M
101	Toschi, Marisa	IMAL - UNL	Argentina	F
102	Uswadkar, Prashant	Shiv Nadar University	India	M
103	Velozo Ruiz, Renato Adolfo	Pontificia Universidad Católica de Chile	Chile	M
104	Vidal, Raúl	FaMAF, UNC	Argentina	M
105	Wendt Herwig	Institut de Recherche en Informatique de Toulouse	France	M
106	Xiao, Yimin	Michigan State Univeristy	USA	M
107	Yavicoli, Alexia	IMAS, UBA	Argentina	F
108	Zuberman, Leandro	Universidad Nacional de Mar del Plata// CONICET	Argentina	M

5. Group Pictures

Week 1:

Week 2: