



CIMPA MEDELLIN 2018

Geometric and Homological Methods in the Representation Theory of Associative Algebras and Their Applications. <http://altenua.udea.edu.co/CIMPA2018Medellin/>

CIMPA RESEARCH SCHOOL

Geometric and Homological Methods in the Representation Theory of Associative Algebras and Their Applications

June 18 – 27, 2018

Maison Marie Pouseppin, Medellín, Colombia

ORGANIZERS

- UNIVERSIDAD DE ANTIOQUIA (**U de A**)
- UNIVERSIDAD NACIONAL DE COLOMBIA, SEDE BOGOTÁ
 - UNIVERSIDAD DISTRITAL

SPONSORS

- Fundación Universidad de Antioquia



- International Center for Pure and Applied Mathematics (**CIMPA**).



- Instituto Colombiano para el Desarrollo de la Ciencia y la Tecnología
(COLCIENCIAS).

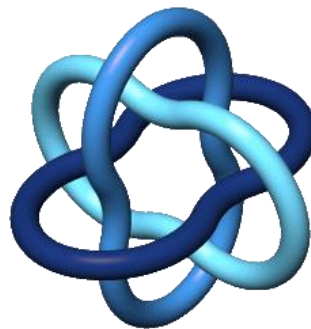


COLCIENCIAS
Ciencia, Tecnología e Innovación

- Instituto Colombiano de Crédito Educativo y Estudios en el Exterior
(ICETEX).



- International Mathematical Union (**IMU**).



- Nord University





CIMPA MEDELLIN 2018

Geometric and Homological Methods in the Representation Theory of Associative Algebras and Their Applications. <http://altnua.udea.edu.co/CIMPA2018Medellin/>

REPORT

CIMPA RESEARCH SCHOOL

Geometric and Homological Methods in the Representation Theory of Associative Algebras and Their Applications

June 18 – 27, 2018

Maison Marie Pouseppin, Medellín, Colombia

The International Center for Pure and Applied Mathematics ([CIMPA](#)), in order to promote the development of mathematical research in developing countries, promotes the organization of research schools with the primary objective of bringing together regional researchers and students with an interest in mathematics and its applications. Thus, in 2018, after a convocatory, the Institute of Mathematics, University of Antioquia ([U de A](#)) and the School of Mathematics of National University of Colombia, Bogotá ([Unal](#)) and Distrital University ([UD](#)) organized a CIMPA Research School "*Geometric and Homological Methods in the Representation Theory of Associative Algebras and Their Applications*" which was held at the Maison Marie Pouseppin during 18-27 June 2018 in the city of Medellín, Colombia.

The CIMPA Research School developed mainly in the following topics:

- Geometric aspects of the representation theory of algebras.
- Homological aspects of the representation theory of algebras.
- Applications of the representation theory of posets and algebras.

AIM OF THE SCHOOL

- To establish links between international and national researchers and students.
- To promote the development of the subject through academic exchange among South American researchers.
- To update the knowledge of our local mathematical community by inviting senior local and international researchers.
- To introduce graduate and advanced undergraduate students to the current research topics.
- To enhance the Algebra community in Colombia.
- To facilitate students connect with international researchers who help them to get funding or at least acceptance for further studies abroad.
- To facilitate Colombian students and professors interested in representations of algebras and its applications, study a Masters or a Doctoral degree in Colombia or abroad.

SCIENTIFIC COMMITTEE

- Claire Amiot, Université Joseph Fourier, Grenoble, France
- Claude Cibils, Université de Montpellier, France
- Henning Krause, Bielefeld University, Germany
- Rachel Taillefer, Université Blaise Pascal, Clermont- Ferrand II, France
- Sonia Trepode, Universidad Nacional de Mar del Plata, Argentina

ADMINISTRATIVE AND SCIENTIFIC COORDINATORS

- Dag Oskar Madsen, Nord University, Norway, daq.o.madsen@nord.no
- Hernán Giraldo, U de A, Medellín, Colombia, hernan.giraldo@udea.edu.co

ORGANIZING COMMITTEE

- Verónica Cifuentes, Universidad Distrital Francisco José de Caldas, vcifuentesv@udistrital.edu.co
- Ivón Dorado, Universidad Nacional de Colombia, iadoradoc@unal.edu.co
- Eduardo do Nascimento Marcos, Universidade de São Paulo, enmarcos@gmail.com
- Agustín Moreno, Universidad Nacional de Colombia, amorenoca@unal.edu.co
- José A. Vélez Marulanda, Valdosta State University, javelezmarulanda@valdosta.edu

ACADEMIC ACTIVITIES

SHORT COURSES (5)

Almost of them each had a duration of 8 hours.

- **Applications of the theory of representation of posets and algebras in cryptography**, Agustin Moreno Cañadas, Universidad Nacional de Colombia, Colombia, amorenoca@unal.edu.co
- **Geometry of representations of algebras**, Ryan Kinser, University of Iowa, United States, ryan-kinser@uiowa.edu
- **Support theory for representations of groups and algebras**, Henning Krause, Bielefeld University, Germany, henning.krause@math.uni-bielefeld.de
- **Special biserial and special multiserial algebras**, Sibylle Schroll, University of Leicester, United Kingdom, schroll@leicester.ac.uk
- **Hochschild cohomology and stable equivalences**, Rachel Taillefer, Université Blaise Pascal, Clermont- Ferrand II, France, rachel.taillefer@math.univ-bpclermont.fr

INTERNATIONAL SPEAKERS (12)

- Claude Cibils, Université de Montpellier, France.
- Vyacheslav Futorny, Universidade de Sao Paulo, Brazil.
- Elizabeth Gasparim, Universidad Católica del Norte, Chile.
- Ryan Kinser, University of Iowa, United States.
- Henning Krause, Bielefeld University, Germany.
- Marcelo Lanzilotta, Universidad de la República, Uruguay.
- Dag Oskar Madsen, Nord University, Norway.
- Ralph Schiffler, University of Connecticut, United States.
- Sibylle Schroll, University of Leicester, United Kingdom.
- Rachel Taillefer, Université Blaise Pascal, Clermont- Ferrand II, France.
- Sonia Trepode, Universidad Nacional de Mar del Plata, Argentina.
- José A. Vélez- Marulanda, Valdosta State University United States.

NATIONAL SPEAKERS (3)

- Erik Backelin, Universidad de los Andes, Colombia.
- Agustín Moreno Cañadas, Universidad Nacional de Colombia, Colombia
- Milton Reyes, Universidad Nacional de Colombia, Colombia.

RESULTS OF THE MEETING

- The event was attended by 103 people, of which 15 were national and international speakers, 23 international students, 42 national students and other participants were Colombian professors.
- Some students made contacts with international researchers to obtain funding or acceptance in the doctoral or postdoctoral programs in their places of origin.
- The Colombian and other mathematical communities in the neighboring countries interested in the topics of the school were educated and updated on the latest research results of great importance.
- Consolidation of national and interregional working groups.
- Mathematical interests of teachers and students involved were greatly encouraged.
- Latest trends in the research topics were made accessible to graduate students and advanced undergraduate students.
- Interaction of students attending the meeting with highly renowned researchers in the topics of the meeting.

CONCLUSIONS

The CIMPA Research School Medellín 2018, "*Geometric and Homological Methods in the Representation Theory of Associative Algebras and Their Applications*", became an arena for exchange of knowledge among participants. It was a great opportunity to update and position our programs at national and international stages, which magnifies the possibility of signing agreements that facilitate, among other activities, the movement of trainees of our programs (in all participating universities) to institutions of origin of visitors, and consolidated the interaction with institutions like the University of Sao Paulo, Universidad Nacional Autónoma de Mexico, Universidad Nacional de Córdoba, Universidad Nacional del Sur, University of the Republic, among others.

The proposed topics were well received by students who attended the event and especially at the University of Antioquia. This allowed advanced semester students of the program to find ideas to write an attractive thesis. Additionally, the participation of students from the Universidad Nacional de Colombia and Universidad Distrital improved links between our and their researchers and students.

The contacts made during the event will be vital for further progress and development in education, science and technology in the country. In addition it will strengthen next academic events, such as International Colloquium on Representations of Algebras and Its

Applications; Alexander Zavadskij held every three years and ALTENCOA meeting held every two years in the country.

Exposure to the research of national and international researchers and their latest contributions to the academic community will be of great benefit to the development and consolidation of the graduate programs of our universities and helps our graduates in their future doctoral and postdoctoral studies.

See below financial report and list of participants.

FINANCIAL REPORT

INCOME

* 1EUR=\$3.365

CIMPA	\$	9.730.000
IMU	\$	5.286.855
Nord University	\$	8.800.000
CIMPA tiquetes	\$	17.125.200
Vice Investigación (Universidad de Antioquia)	\$	15.418.000
Vice docencia (Universidad de Antioquia)	\$	2.000.000
Instituto de Matemáticas (U. de Antioquia)	\$	12.000.000
Rectoría (Fundación Universidad de Antioquia)	\$	10.000.000
Decanatura (Universidad de Antioquia)	\$	5.200.000
ICETEX	\$	29.962.000
Posgrado Matemáticas (Universidad de Antioquia)	\$	2.000.000
Regionalización (Universidad de Antioquia)	\$	4.000.000
Instituto para Regiones (Universidad de Antioquia)	\$	2.200.000
Universidad Nacional de Colombia, sede Manizales	\$	4.000.000
Bienestar Universitario (Universidad de Antioquia)	\$	1.000.000
Universidad Nacional de Colombia, Bogotá	\$	29.000.000
Universidad Distrital	\$	8.000.000
Self-financing	\$	48.685.000
Total Income	\$	214.407.055 (63.717 EUR)

EXPENSES

Speaker tickets	\$	51.300.000
International tickets	\$	24.300.000
National tickets	\$	6.190.000
Hotel speakers	\$	35.438.000
Hotel international students	\$	23.795.000
Hotel national students	\$	41.899.000
Food local (Medellín) students	\$	5.850.000
Staff and regional students (Caucasia, Antioquia)	\$	5.000.000
Memoirs and material for the event	\$	4.050.000
Morning snacks	\$	5.916.000
Afternoon snacks	\$	5.712.000
Coffee	\$	4.896.000
Total Expenses	\$	214.346.000 (63.699 EUR)

DIFFERENCE*

\$ 61.055 (18 EUR)

LIST OF PARTICIPANTS

1	Adriana Marcela Fonce C.	Universidad de Antioquia	Colombia	amafeca@gail.com
2	Agustin Moreno Cañadas	Universidad Nacional de Colombia	Colombia	amorenoca@unal.edu.co
3	Jarvin Jeffrey Gallego	Universidad Nacional de Colombia	Colombia	jgallegom@unal.edu.co
4	Adriana Xavier	Universidade Federal de Lavras.	Brasil	adrianaxavier2003@yahoo.com.br
5	Alejandra Suarez Galeano	Universidad Distrital	Colombia	alejandrasuarez0301@gmail.com
6	Alex Sierra	Universidade de São Paulo	Brasil	alexsier@ime.usp.br
7	Alexander Ramirez B.	Universidad de Antioquia	Colombia	jalexander.ramirez@udea.edu.co
8	Alexis Osorio	Universidad de Antioquia	Colombia	alexisosorio3@gmail.com
9	Ana Melisa Paiba	Universidade de São Paulo	Brasil	ampaibaa@unal.edu.co
10	Andres Franco	Universidad de Antioquia	Colombia	andresfrancofondono@gmail.com
11	Angie Yurani Puentes	Universidad Distrital	Colombia	a728angie@hotmail.com
12	Astrid Carolina Melo	Universidad Nacional de Colombia	Colombia	amelol@unal.edu.co
13	Beatriz de Rancell Montero	Universidad de la Habana	Cuba	bea38isa@gmail.com
14	Bilson Castro	Universidad de Antioquia	Colombia	bilson,castro@udea.edu.co
15	Carlos Alejandro Espinal Molina	Universidad de Antioquia	Colombia	alejandro.espinal@udea.edu.co
16	Carlos Zainea	Universidad Nacional	Colombia	cizaineam@unal.edu.co
17	Claude Cibils	UNIVERSITE DE MONTPELLIER	Francia	claudcibils@gmail.com
18	Claudio Rodriguez Beltran	Universidad Nacional de Colombia	Colombia	crodriguezbe@unal.edu.co
19	Cléber dos Santos	Universidade Federal do Paraná	Brasil	clberb21@gmail.com
20	Cristian Arturo Chaparro	Universidad de Buenos Aires	Argentina	matcris5@gmail.com
21	Cristian Felipe Gallego	Universidad de Antioquia	Colombia	cristianf.gallego@udea.edu.co
22	Dag Oskar Madsen	NORD UNIVERSITY	Noruega	dag.o.madsen@nord.no
23	Daniel Jaramillo	Universidad de Antioquia	Colombia	divan.jaramillo@udea.edu.co
24	Danna Moreno	Universidad Nacional de Colombia	Colombia	dannamoreno@javeriana.edu.co
25	Diana Paola Franco	Universidad de Antioquia	Colombia	paola.franco@udea.edu.co
26	Diego Bravo	Universidad de la República	Uruguay	dbravo27@gmail.com
27	Diego Alejandro varelas	Universidad de Antioquia	Colombia	diego.varelas@udea.edu.co
28	Diego Maca	Universidad Nacional de Colombia	Colombia	diegomacqa@gmail.com

29	Dzoara Selene Nuñez	Universidad Distrital	Colombia	soaranunez@gmail.com
30	Edson R. Alvares	U. Federal do Parana	Brasil	rolo1rolo@gmail.com
31	Edward Salamanca	Universidad Nacional de Cordoba	Argentina	julisala14@hotmail.com
32	Elizabeth Gasparim	U. CATOLICA DEL NORTE	Chile	etgasparim@gmail.com
33	Erik Backelin	Universidad de los Andes	Colombia	erbackel@uniandes.edu.co
34	Faber Gómez G.	Universidad de Antioquia	Colombia	faber.gomez@udea.edu.co
35	Frederik Caneepel	University of Antwerp	Belgica	free.caenepeel@gmail.com
36	Gabriel Bravo	Universidad Nacional de Colombia	Colombia	gbravor@unal.edu.co
37	Gabriele Bocca	University of East Anglia.	Reino Unido	nkb15jvu@uea.ac.uk
38	Geraldin Martínez	Universidad Nacional de Colombia	Colombia	gemartinezgo@gmail.com
39	Gordana Todorov.	NORTHEASTERN UNIVERSITY	USA	g.todorov@neu.edu
40	Gregorio Rodriguez	Universidad Nacional de Colombia	Colombia	crodriguezbe@unal.edu.co
41	Guillaume Douville	Université du Québec	Canada	G.Douville@USherbrooke.ca
42	Harrinson Arrubla	Universidad Nacional de Colombia	Colombia	haarrublar@unal.edu.co
43	Heily Wagner	Universidade Federal do Paraná	Brasil	heilywagner@ufpr.br
44	Hennning Krause	Bielefeld University	Alemania	hkrause@math.uni-bielefeld.de
45	Hernan Giraldo	Universidad de Antioquia	Colombia	hernan.giraldo@udea.edu.co
46	Isaias Marin	Universidad Nacional de Colombia	Colombia	imaringa@unal.edu.co
47	Ivon Dorado	Universidad Nacional de Colombia	Colombia	iadoradoc@unal.edu.co
48	Jacob Andres Henao	Universidad de Antioquia	Colombia	jackobhen@hotmail.com
49	Javier Andres Causil	Universidad de Antioquia	Colombia	javier.causil@udea.edu.co
50	Javier Coppola	Instituto de Matemáticas y Estadística Rafael Laguna	Uruguay	jcoppola@fing.edu.uy
51	Johny Calderon	Universidad de Antioquia	Colombia	yohny.calderon@udea.edu.co
52	Jorge H. Zea	Universidad de Antioquia	Colombia	hernando.zea@udea.edu.co
53	Jorge Jimenez	CIMPA	España	jorge.cimpa@gmail.com
54	Jose Alberto Velez Marulanda	Valdosa State University	USA	javelezmarulanda@valdosta.edu
55	José Armando Vivero	Universidad de la República	Uruguay	javivero91@gmail.com
56	José Suero	Universidad Simon Bolivar	Venezuela	joseccs550@gmail.com
57	Juan Camilo Sierra	Universidad de Antioquia	Colombia	juancamilo.sierra@udea.edu.co
58	Juan Diego Cifuentes	Universidad Nacional de Colombia	Colombia	juancho7200@gmail.com

59	Juan Esteban Lopez	Universidad de Antioquia	Colombia	jesteban.lopez@udea.edu.co
60	Juan Hurtado R.	Universidad Nacional de Colombia	Colombia	jumhurtadore@unal.edu.co
61	Juan Pablo Infante	Universidad Nacional de Colombia	Colombia	jpinfanted@unal.edu.co
62	Julia Pevtsova	UNIVERSITY OF WASHINGTON	USA	pevtsova@gmail.com
63	Julian Serna	Universidad Nacional de Colombia	Colombia	rjsernav@unal.edu.co
64	Karen Lizeth Martinez Acosta	Universidade Federal de Minas Gerais	Brasil	Klizethmartinez@ut.edu.co
65	Kaveh Mousavand	UNIVERSITE DU QUEBEC	Canada	k.mousavand@lacim.ca
66	Lucas Queiroz Pinto	Universidade Federal do Amazonas	Brasil	lucasqueirozp94@gmail.com
67	Lucía Rossi	Universidad Nacional de Mar del Plata	Argentina	lucia.rossi.moure@gmail.com
68	Makar Plakhotnyk	Universidade de São Paulo	Brasil	makar.plakhotnyk@gmail.com
69	Manuel Orjuela	Universidad Nacional de Colombia	Colombia	mrrojuelav@unal.edu.co
70	Marcelo Lanzilotta	Universidad de la República	Uruguay	marclanlourd@gmail.com
71	Maria Camila Mejía G.	Universidad Nacional	Colombia	mcmejiag@unal.edu.co
72	Maria Valencia Areválo	Universidad Nacional de Colombia	Colombia	mrvalenciaa@unal.edu.co
73	Armando Reyes	Universidad Nacional	Colombia	mareyesv@unal.edu.co
74	Noelia Bortolussi	Universidad Nacional de Cordoba	Argentina	bortolussinb@gmail.com
75	Octavio Mendoza	U. AUTONOMA DE MEXICO	Mexico	octaviomendoza@hotmail.com
76	Olmer Folleco S.	Universidad Nacional de Colombia	Colombia	ofollecoc@unal.edu.co
77	Omar Saldarriaga	Universidad de Antioquia	Colombia	saldarriagao55@gmail.com
78	Oscar Daniel Bernal Miranda	Universidad Distrital	Colombia	osdabemi@gmail.com
79	Oscar Tujano	Universidad Nacional de Colombia	Colombia	odtunjanor@unal.edu.co
80	Pedro Fernando Fernandez E.	Universidad Nacional de Colombia	Colombia	pffernandeze@unal.edu.co
81	Pedro Hernandez	Universidad de Antioquia	Colombia	pedro.hernandez@udea.edu.co
82	Rachel Taillefer	UNIVERSITE CLERMONT AUVERGNE	Francia	Rachel.Taillerfer@uca.fr
83	Ralf Schiffler	UNIVERSITY OF CONNECTICUT	USA	ralfschiffler@gmail.com
84	Raul Velasquez	Universidad de Antioquia	Colombia	raulevo@gmail.com
85	Ryan Kinser	UNIVERSITY OF IOWA	USA	Ryan-kinser@uiowa.edu
86	Santiago Duque	Universidad de Antioquia	Colombia	santiago.duqueo@udea.edu.co
87	Sebastián Marulanda	Universidad Nacional de Colombia	Colombia	smarulandar@unal.edu.co
88	Sibylle Schroll	UNIVERSITY OF LEICESTER	United Kingdom	ss489@le.ac.uk

89	Sofia D'Alessio	Instituto de Investigaciones Matemáticas, Luis A. Santalo	Argentina	sofia.dalesio@gmail.com
90	Sonia Trepode	UNAL DE MAR DE PLATA	Argentina	strepode@gmail.com
91	Veronica Cifuentes	Universidad Nacional de Colombia	Colombia	vcifuentesv@unal.edu.co
92	Véronique Bazier-Matte	Université du Québec à Montréal	Colombia	veronique.bazier-matte@usherbrooke.ca
93	Vyacheslav Futorny	Universidade de São Paulo	Brasil	vfutorny@gmail.com
94	Wesley Dos Santos	Universidade Federal do Paraná	Brasil	wesleysvb@gmail.com
95	Yenni Carolina Molano	Universidad de Antioquia	Colombia	yenny.molano@udea.edu.co
96	Yesica Tatiana Carrasquilla	Universidad de Antioquia	Colombia	yesica.carrasquilla@udea.edu.co
97	Yohny Calderon	Universidad de Antioquia	Colombia	yohny.calderon@udea.edu.co
98	Daniel Ricardo Barrero	Universidad de los Andes	Colombia	dr.barrero2562@uniandes.edu.co
99	Carlos Ochoa	Universidad Distrital	Colombia	karlos8ac@gmail.com
100	Maria Camila Ramirez	Universidad Nacional	Colombia	macramirezcu@unal.edu.co
101	Carmen Beatriz Cuervo Arias	Universidad del Tolima	Colombia	cbcuervoa@ut.edu.co
102	Jairo Guasguita Ruiz	UPTC	Colombia	jairo.guasguita@uptc.edu.co
103	Jessica Gonzalez	Universidad del Valle	Colombia	je.ka109110@gmail.com