



# **SPANISH CONTRIBUTION TO CIMPA 2010-2021**

**February 2021**



On the occasion of the 10 years of collaboration between Spain and the CENTRE INTERNATIONAL DE MATHÉMATIQUES PURES ET APPLIQUÉES (CIMPA) the Comité Español de Matemáticas (CEMat) has driven the elaboration of this report. After so many years of work, we thought it is necessary to show the impact of such an agreement and the benefits it has reported to both sides.

CIMPA is an institution strongly compromised in fighting exclusion and scientific poverty in difficult areas of the world. It has been growing a lot in these ten years, as more countries and institutions followed the Spanish example and became associated members. As the report shows the involvement of Spanish Mathematicians in the project has been of great importance, both from the scientific point of view and to strengthen ties and scientific cooperation with developed countries.

CEMat is a Spanish organization that takes care of the visibility of Spanish Mathematics and of Spanish Mathematicians in scientific international organizations. Ensuring the continuity of the cooperation between the Spanish Government and CIMPA is one of the dearest jobs of CEMat. We hope that this report helps to keep memory of such a fruitful and long lasting cooperation and even helps to reinforce it.

We thank to all people that have made this report possible. Especially to Jorge Mozo for the work done collecting and organizing the data and to the CIMPA staff for all the collaboration while making the report.

February, 24 2021

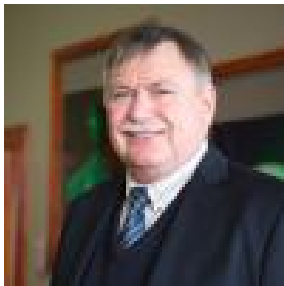
Alfonso Gordaliza -President of CEMat  
María Jesús Carro-Vice-President of CEMat  
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## Contents

1. MESSAGE FROM BARRY GREEN, PRESIDENT OF CIMPA.....	4
2. HISTORY, PURPOSE AND STRUCTURE OF CIMPA .....	5
3. SPAIN JOINS CIMPA .....	7
4. SPANISH CONTRIBUTION.....	9
5. IMPACT AND FUTURE OF CIMPA.....	16

## 1. MESSAGE FROM BARRY GREEN, PRESIDENT OF CIMPA



For more than 40 years CIMPA has contributed significantly to growth and research in mathematics in developing countries. As elsewhere in the world in these countries there are many talented young mathematicians, who are passionate about research, wish to enter and be part of the worldwide mathematics community and benefit from and collaborate with experts in the various mathematical disciplines. CIMPA's mission is to contribute to this, through its research schools, fellowships and special courses offered in developing countries and coordinated by local mathematicians. In this way CIMPA has reached thousands of young mathematicians, many who have grown into leading researchers in their home countries.

For the first 30 years, this special project was undertaken solely by the French mathematics community, with generous support by individuals, societies, institutions and the French Higher Education and Research Ministry. The activities of CIMPA were soon supported by mathematicians from other European countries, most notably by Spanish mathematicians. In 2009 Spain became a new country member of CIMPA. This was made possible by the enthusiastic and determined involvement by the Spanish mathematics community led by Olga Gil Medrano, the CIMPA Director at that time Claude Cibils, its President Tsou Sheung Tsun, the members of CIMPA and the associated institutions in both France and Spain.

This membership has played an enormous role in strengthening CIMPA and the impact of its activities. Spain has provided financial support, dedicated service and contribution to the functioning of CIMPA, on its Governing Board, its Scientific Council, Steering Committee and particularly with the Research Schools, its flagship programme. Spain entering CIMPA also marked the beginning of CIMPA becoming better recognized as a European mathematics development project. Norway became a country member in 2011, and there has been dedicated involvement by the Secrétariat d'État à la formation, à la recherche et à l'innovation in Switzerland, via the institutional membership of the University of Neuchâtel.



In the future we are confident more European countries will join CIMPA, enabling it to play an even greater role contributing to the growth of mathematics research in developing countries. France, and then Spain took the first steps to make this happen and the success of this association is of great value to CIMPA.

It is a pleasure to acknowledge and thank Spain for its special contribution to CIMPA and to look forward to many more years of strong association.

## 2. HISTORY, PURPOSE AND STRUCTURE OF CIMPA

CIMPA (Centre International de Mathématiques Pures et Appliquées) is an international institution, founded in France in 1978, whose aim is to promote research in Mathematics in developing countries. It is a category 2 UNESCO Center. It develops its mission by means of different scientific activities including:

- a. Organization and support of Research Schools in developing countries (now called **CIMPA Schools**). This is the main historical activity of CIMPA. A CIMPA School consist typically in a two-weeks specialized course, about a topic of interest in Mathematics or related subjects, given by renowned specialists in the area who deliver the courses without profit. They are aimed at students and research teaching staff from developing countries. CIMPA provides the schools with financial support to cover the travel and living expenses of participants from neighbouring countries. Call for proposals are launched every year, with a view to organizing twenty or so CIMPA Schools the following year.

Up to 2020, CIMPA has organized about 360 Schools in 63 countries.

- b. **CIMPA Courses**. The CIMPA Courses program consists in funding the visit of a lecturer to teach a master or research level course in Mathematics within the geographic areas of activities of CIMPA (Africa, Central or South America, Asia).

The Call for Applications is open permanently, projects of CIMPA Courses may be submitted at any time during the year.

- c. **CIMPA Fellowships**. The CIMPA Fellowships program offers the opportunity for young mathematicians from developing countries to participate in short-term thematic programs in European institutes of mathematics. For each program, whose duration may vary from one to three months, the CIMPA and the hosting institute cover the whole cost of participation of several laureates. A Call for Applications is opened for each program. The present partners of the CIMPA Fellowships program are the following:

- Institut Henri Poincaré (Paris, France).
- Centre de Recerca Matemàtica (Barcelona, Spain).



- Centre International de Rencontres Mathématiques (Marseille, France).
- d. **Schools in Partnership.** Even if it is not an activity directly organized by CIMPA, CIMPA supports advanced mathematical schools in partnership with continental mathematical unions or societies. These schools are usually of Master's or final Bachelor Degree level, and are intended for students from countries where they stand and from neighboring countries.

Calls for proposals, dealing with these proposals and work with the organizers of these schools to improve projects are the responsibility of ad-hoc committees of the continental unions where CIMPA can be represented.

Once the projects of schools are approved by the continental unions, CIMPA studies them to confirm its partnership and decide the financial support that will be provided to each school. CIMPA covers the travel and living expenses of participants from neighbouring developing countries. Most often lecturers come from neighbouring countries and CIMPA is not represented.

The different Schools in Partnership supported by CIMPA are:

- African Mathematical Schools (AMS)
- Escuelas de Matemática de América Latina y del Caribe (EMALCA)
- SEAMS Schools of Mathematics (SEAMS)
- West Asia Mathematical Schools (WAMS)

CIMPA is led by a President, who leads the Governing Board, in close collaboration with the Executive Committee. The Executive Director is in charge of the day-to-day running of the association, mainly concerning the Scientific Activities, helped by a team of Scientific Officers, in charge of supervising the different activities of CIMPA. At present, the Governing Board is formed by:

- Barry Green (University of Stellenbosch, South Africa), President.
- Annie Raoult (Université Paris Descartes, France), Vice President.
- Viet Dung Nguyen (Vietnam Academy of Science and Technology), Secretary.
- Joachim Yameogo (Université Côte d'Azur, France), Treasurer.
- Mary Teuw Niane (Senegal), Member.
- Servet Martínez (Universidad de Chile), Member.
- Fatima Aboud (University of Diyala, Iraq), Member.

The Executive Team, who are in charge of the day-by-day running of CIMPA and act as expert consultants in different geographical areas, is formed by:

- Christophe Ritzenthaler (Université de Rennes I, France), Executive Director.
- Alp Bassa (Bogaziçi üniversitesi, Turkey), Scientific Officer.



- Yacine Chitour (Université paris-Sud, France), Scientific Officer.
- Sophie Dabo (Université de Lille, France), Scientific Officer.
- Giulia di Nunno (University of Oslo, Norway), Scientific Officer.
- Lidia Fernández (Universidad de Granada, España), Scientific Officer.
- Fabrice Gamboa (Université Paul Sabatier, France), Scientific Officer.
- Joan-Carles Lario (Universitat Politècnica de Catalunya, Spain), Scientific Officer.
- Jorge Mozo Fernández (Universidad de Valladolid, Spain), Scientific Officer.
- Vlady Ravelomanana (Université paris 7, France), Scientific Officer.
- Rosane Ushirobira (INRIA, France), Scientific Officer.
- Agnès Gomez, Executive Secretary.
- Héla Lamiri, Communication Officer.
- Roland Ruelle (Université Côte d'Azur, France), Information Technology Responsible.

Besides that, a Steering Council, composed by the members of the Governing Board, and a certain number of Institutional Members, prepares the medium and long term scientific strategy of CIMPA. It provides policy guidance, proposes priorities and sets recommendations. It is also in charge of the scientific promotion of CIMPA. Every year, the Steering Council decides the program of CIMPA research schools and other activities, based on the recommendations of the International Scientific Council.

The Scientific Council supervises all Scientific projects submitted to CIMPA. Every such a Project is closely reviewed, and scientific reports and recommendations are issued. They also make proposals to the Director and Governing Board concerning the scientific policy of CIMPA.

CIMPA is finally composed by Individual Members, and Institutional Members, who gather once a year at the General Assembly. Up to 2010, France was the only country member of CIMPA, but in 2010 Spain joined CIMPA as a state member, and later, Norway and Switzerland followed the same path, joining CIMPA as country members.

### 3. SPAIN JOINS CIMPA

During 2008, a working group gathered at the Spanish Ministerio de Ciencia e Innovación (MICINN), in order to study the entry of Spain in CIMPA. This group was promoted by Olga Gil Medrano (Comité Español de Matemáticas, CEMAT), and Claude Cibils (then Director of CIMPA). As a consequence of the different talks, Enrique Zuazua (Universidad Autónoma de Madrid and founder of the Basque Center of Applied Mathematics) was appointed as Director of the Scientific Committee of CIMPA. After several meetings in Paris, and in MICINN, participated by the Spanish Ministry, CIMPA, and several Scientific Societies, on March 3, 2010 it was signed the agreement of collaboration between Spain and CIMPA, and Spain joined CIMPA as a country member in the next General Assembly, in June 2010.



Picture: Signature of the agreement between Spain and CIMPA in 2010, in the headquarters of MICINN. From left to right, Philippe Maisonobe (Nice University), Frank Pacard (MESR, France), Montserrat Torné (Directora General de Cooperación Internacional, MICINN), Felipe Pétriz (Secretario de Estado de Investigación, MICINN), Tsou Sheung Tsun (President of CIMPA), Antonio Campillo (President of CEMAT), Teresa Díaz (Dirección General de Cooperación Internacional, MICINN), Claude Cibils (Executive Director of CIMPA), Alain Damlamian (Vice President of CIMPA).

Under this agreement, Spain contributed with 45000 € to develop The CIMPA Schools during 2010. CIMPA agreed to designate Spanish researchers to participate in these activities.

This agreement was renewed in 2011 (Spain contributed with 25000 €), 2012 (20000 €), 2013 (20000 €), 2014 (20000 €). The original agreement was transformed in Conventions of Collaboration between FECYT (Fundación Española para la Ciencia y la Tecnología) and CIMPA. From 2015 to 2018, the agreement was extended, and Spanish contribution mounted to 30000 €. In 2019, the contribution of Spain was 15000 €, besides some contribution of the AECID to the CIMPA Schools of Santiago de Cuba and San Salvador, that were scheduled to have place in 2020 (and postponed, respectively, to 2021 and 2022).



## 4. SPANISH CONTRIBUTION

After Spain became a member of CIMPA in 2010, it has contributed actively in all structures of CIMPA, both administrative and scientific. Details of this collaboration are as follows.

**Governing Board:** Iván Área (Universidad de Vigo) has been the General Secretary of CIMPA from January 2017 to 2020.

**Scientific Council:** As part of the agreement between Spain and CIMPA, Enrique Zuazua became President of the Scientific Council. He was in office from 2009 to 2017. During this period, Marisa Fernández (Universidad del País Vasco) was the Secretary of the Scientific Council. Since 2017, Henar Herrero Sanz (Universidad de Castilla – La Mancha) is one of the Scientific Councilors.



Picture: Enrique Zuazua, Marisa Fernández, Henar Herrero and Iván Área.

**Executive Team:** Several Spanish mathematicians have worked as Scientific Officers of CIMPA since 2010. They are:

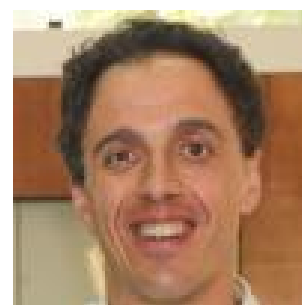
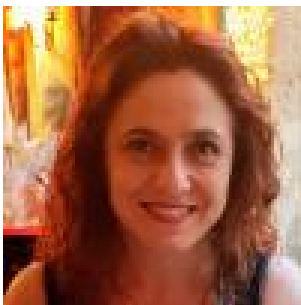
- Jorge Jiménez Urroz (Universitat Politècnica de Catalunya), from 2010 to 2018. Scientific Officer for West Asia and Latin America.

- Mercedes Siles Molina (Universidad de Málaga), from 2010 to 2017. Transversal Scientific Officer.
- Jorge Mozo Fernández (Universidad de Valladolid), 2017-present. Scientific Officer for West Asia and Latin America.
- Lidia Fernández (Universidad de Granada), 2018-present. Scientific Officer for Asia.
- Joan-Carles Lario (Universitat Politècnica de Catalunya), 2018-present. Scientific Officer for Latin America and Asia.

Scientific Officers supervise the different activities of CIMPA, mainly the CIMPA Schools, and offer expertise to the potential organizers of the schools to submit their projects and develop them. They also participate in other activities, giving courses or driving the organizations of courses in developing countries. The schools supervised by the Spanish scientific officers so far are:

- Modélisation, systèmes non linéaires et applications. Dakar (Senegal), 2011. Supervisor: Mercedes Siles.
- Systèmes dynamiques dans les variétés et applications. Kinshasa (Congo), 2011. Supervisor: Jorge Jiménez.
- Mathematical Modelling and numerical simulation for waves propagation and imaging. Caracas (Venezuela), 2012. Supervisor: Mercedes Siles.
- Galois Theory for Difference Equations. Santa Marta (Colombia), 2013. Supervisor: Mercedes Siles.
- Associative and non associative Algebras and Dialgebras. Guanajuato (México), 2013. Supervisor: Mercedes Siles.
- Generalized Nash Equilibrium Problems. New Delhi (India), 2013. Supervisor: Jorge Jiménez.
- Hypergeometric Functions and Representation Theory. Ulaanbaatar (Mongolia), 2013. Supervisor: Jorge Jiménez.
- Numerical methods in fluid mechanics, mathematical epidemiology and reaction-diffusion systems. Saint-Louis (Senegal), 2013. Supervisor: Mercedes Siles.
- Algebraic Curves over finite fields. Manila (Philippines), 2013. Supervisor: Jorge Jiménez.
- Inverse problems: Theory and Applications. Erbil (Iraq), 2014. Supervisor: Jorge Jiménez.
- Real Algebraic Geometry. Villa de Leyva (Colombia), 2014. Supervisor: Mercedes Siles.
- Random structures, Analytic and Probabilistic Approaches. Nablus (Palestine), 2014. Supervisor: Mercedes Siles.
- Operator Theory and the Principles of Quantum Mechanics. Meknès (Morocco), 2014. Supervisor: Mercedes Siles.
- Leavitt Path Algebras. Izmir (Turkey), 2015. Supervisor: Mercedes Siles.
- Transformation Groups and Dynamical Systems. Lima (Perú), 2015. Supervisor: Mercedes Siles.
- Latin American School of Algebraic Geometry and Applications. Cabo Frio (Brazil), 2015. Supervisor: Mercedes Siles.
- Tilings and Tessellations. Isfahan (Iran), 2015. Supervisor: Jorge Jiménez.
- Non commutative algebra. Coclé (Panamá), 2015. Supervisor: Mercedes Siles.

- Mathematical Modelling in Biology and Medicine (Santiago de Cuba), 2016. Supervisor: Mercedes Siles.
- Mathematical and Computer Models in Epidemiology, Ecology and Agronomy. Yaoundé (Cameroon), 2016. Supervisor: Iván Área.
- Representation Theory and Applications to Differential Equations. Kingston (Jamaica), 2017. Supervisor: Jorge Jiménez.
- Analyse Numérique & Équations aux Dérivées Partielles. Ifrane (Morocco), 2017. Supervisor: Jorge Mozo Fernández.
- Associative and non-associative algebras. Novosibirsk (Russia), 2017. Supervisor: Iván Área.
- Combinatorial Commutative Algebra. Lahore (Pakistan), 2018. Supervisor: Jorge Mozo Fernández.
- Quasi-Cyclic and Related Algebraic Codes. Ankara (Turkey), 2018. Supervisor: Jorge Mozo Fernández.
- Elliptic Curves: Arithmetic and Computation. Montevideo (Uruguay), 2019. Supervisor: Jorge Mozo Fernández.
- Representations of Algebras. Isfahan (Iran), 2019. Supervisor: Jorge Mozo Fernández.
- Dynamical Systems and Applications to Biology. Dhaka (Bangladesh), 2019. Supervisor: Lidia Fernández.
- Hopf Algebras and Tensor Categories. Córdoba (Argentina), 2019. Supervisor: Jorge Mozo Fernández.
- Latin American School on Algebraic geometry and its Applications. Talca (Chili), 2019. Supervisor: Joan-C. Lario.
- Group Actions in Arithmetic and Geometry. Yogyakarta (Indonesia), 2020. Supervisor: Lidia Fernández.



Picture: Lidia Fernández, Joan-Carles Lario and Jorge Mozo Fernández, Scientific Officers.

**Steering Committee:** Since the joining of Spain, the Steering Committee of CIMPA has met every two years in Spain. Meetings took place in Málaga (2012), Barcelona (2014), Granada (2016), Sevilla (2018) and Valladolid (2020).



Picture: The Steering Committee of CIMPA meets at the University of Valladolid (2020).

**Members:** CIMPA members are designated in the General Assembly after recommendation by two active members. They must be mathematicians (or related) wishing to work in profit of the research in mathematics in developing countries. Eight Spanish mathematicians are now individual members of CIMPA.

Institutions, associations or learned societies working in mathematics can also be institutional members of CIMPA. From Spain, institutional members are:

- Comité Español de Matemáticas (CEMAT).
- Ministerio de Ciencia, Innovación y Universidades (outdated affiliation after the excision of this Ministry).
- Real Sociedad Matemática Española (RSME).
- Sociedad de Estadística e Investigación Operativa (SEIO).
- Sociedad Española de matemática Aplicada (SEMA).
- Societat Catalana de Matemàtiques (SCM).

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Besides this integration in both the administrative and Scientific structures of CIMPA, many Spanish mathematicians have organized CIMPA School, even before the joining of Spain. The following is a list of the Spanish mathematicians that have organized CIMPA Schools up to now:

- Juan Montijano and Eduardo Martínez (Universidad de Zaragoza). Santiago de Cuba (2020, postponed to 2021).
- Mercedes Siles Molina (Universidad de Málaga). Khansar, Iran (2020, postponed), and Meknès, Morocco (2014).

- Begoña Vitoriano (UCM). San Salvador, El Salvador (2020, postponed to 2022).
- Manuel Ladra (USC). Antananarivo, Madagascar (2020, postponed) and Tashkent, Uzbekistán (2018).
- Juan Cuadra (Universidad de Almería). Córdoba, Argentina (2019).
- María J. Garrido Atienza (Universidad de Sevilla). Hanoi, Vietnam (2018).
- Antonio Jesús Calderón (Universidad de Cádiz). Casablanca, Morocco (2018).
- Tere Seara (UPC). Dangbo, Benin (2018).
- Dolores Martín Barquero (Universidad de Málaga). Muizenberg, South Africa (2018).
- Ángel del Río (Universidad de Murcia). Kingston, Jamaica (2017).
- Juan Jacobo Simón Piñero (Universidad de Murcia). Sao Paulo, Brazil (2017).
- Alberto Elduque (Universidad de Zaragoza). Novosibirsk, Russia (2017).
- Clementa Alonso (Universidad de Alicante). Lima, Peru (2017).
- Martín Sombra (Universidad de Barcelona). Santiago, Chili (2016).
- José Antonio Carrillo (Universidad Autónoma de Barcelona). Santiago de Cuba (2016).
- Antonio Viruel (Universidad de Málaga). Rabat, Morocco (2016).
- Joseph Miret (Universitat de Lleida). La Habana, Cuba (2016).
- Nuria Corral Pérez (Universidad de Cantabria). Lima, Peru (2015).
- Gonzalo Aranda (Universidad de Málaga). Izmir, Turkey (2015).
- Jorge Marzo Sánchez (Universidad de Barcelona). Buenos Aires, Argentina (2015).
- Cándido Martín González (Universidad de Málaga). Coclé, Panama (2015) and Guanajuato, Mexico (2013).
- Jorge Jiménez Urroz (UPC). Dangbo, Benin (2014).
- Felipe Cano Torres (Universidad de Valladolid). Cuernavaca, Mexico (2014).
- Oriol Serra (UPC). Vientiane, Laos (2014).
- Jorge Mozo Fernández (Universidad de Valladolid). Barranquilla, Colombia (2013).
- Joseph Vives (Universidad de Barcelona). Marrakech, Morocco (2013).
- Simeon Ball (UPC). Bangkok, Thailand (2013).
- Blanca Ayuso de Dios (CRM). Bangalore, India (2013).
- Edgar Martínez Moro (Universidad de Valladolid). Morelia, Mexico (2012).
- Antonio Cuevas (UAM). Punta del Este, Uruguay (2012).
- Enrique Zuazua (UAM). Marrakech, Morocco (2009).
- Ignacio Luengo Velasco (UCM). Madrid, Spain (2006).
- Eduardo Casas Rentería (Universidad de Cantabria). Castro Urdiales, Spain (2006).
- Luis Narváez Macarro (Universidad de Sevilla). Sevilla, Spain (1996).

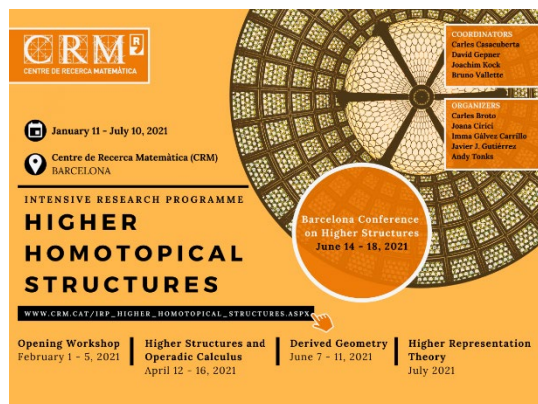


Picture: CIMPA Schools in Montevideo, Lahore (supervised by Jorge Mozo, University of Valladolid), Lima (supervised by Mercedes Siles, University of Málaga), and Manila (supervised by Jorge Jiménez, UPC)

CIMPA Courses have been delivered by:

- Leonardo Fernández Jambrina (UPM). Maputo (Mozambique), 2020.
- Jorge Mozo Fernández (University of Valladolid). Isfahan (Iran), 2020, and El Salvador (San Salvador), 2018.
- Ederlinda Viñuales Gavín (NASE Barcelona), Mbabara (Uganda), 2019.
- Rosa María Ros Ferré (NASE Barcelona). Mbabara (Uganda), 2019.
- Javier Castro Cantalejo (UCM). Maputo (Mozambique), 2019.
- Iván Área (Universidad de Vigo). Jaipur (India), 2019.
- Capi Corrales Rodríguez (UCM). Kirtipur (Nepal), 2018.
- Andrés Marcos Encinas (UPC). San Luis (Argentina), 2018.
- José Manuel Corcuera (University of Barcelona). Maputo (Mozambique), 2017.
- Juan Tinguaro Rodríguez González (UCM). Maputo (Mozambique), 2018.
- Pau Miró i Martínez (Universitat Politècnica de Valencia). Maputo (Mozambique), 2018.

CIMPA Fellowships sponsors young mathematicians from developing countries to participate in a thematic period in a research center. Since 2019, one of the partners of this program is Centre de Recerca Matemàtica (CRM, Barcelona). Up to now, four students have participated in this program, and the call for applications for the 2021 program is now open.



Picture: Thematic program at CRM, and CIMPA Schools 2021 (posters)

It is good to highlight that Spain has also benefited from its joining to CIMPA. The 9th European Congress of Mathematics, the most important mathematical gathering taking place in Europe, celebrated every 4 years, will take place in Sevilla in 2024. CIMPA supported the designation of Sevilla as host institution for this event, which contributed to the success of the candidature.

## 5. IMPACT AND FUTURE OF CIMPA

The experience of more than 40 years shows that the CIMPA Schools and other events organized by CIMPA have a strong impact in the mathematical communities of the countries involved. Not only they give an important boost to the teaching and research, but they contribute to the training of future professionals. As an example, several PhD thesis have their origin in the contacts made during CIMPA Schools among students, speakers and CIMPA Officers:

- Jean-Daniel Djida and Faiçal Ndaïrou obtained their PhD under the supervision of Iván Área, in 2019 and 2020, respectively. In particular, in the second thesis was published one epidemiological model that is widely being used now to predict the progress of the COVID-19 pandemics, and has attracted the interest of Spanish media, both printed and digital. In particular, it predicts the advance under the appearance of new more infectious strains, as it is happening now.
- José F. Solanilla Hernández (Coclé, Panamá) realized his PhD under the supervision of Mercedes Siles. It was the first doctoral program in mathematics in this country.
- Hernán Neciosup (Lima, Peru) and Sergio A. Carrillo (Bogotá, Colombia) obtained their PhD under the supervision of Jorge Mozo. They are currently permanent professors at their origin universities.

In these difficult times of pandemics, CIMPA activities haven't stopped. Certainly, many activities scheduled for 2020 have been postponed, and rescheduled for 2021 and 2022. But at the same time, new opportunities of promoting mathematics in developing countries have appeared. Some CIMPA Schools have been moved to an online version, and a new program of online CIMPA courses has just been set. An online/hybrid school can work and bring important knowledge to the students. Students acknowledge the efforts to organize something in a time where they are more isolated than ever. Having a privileged contact with great professors, even in a « degraded » electronic form is certainly a chance they won't let pass if offered to them.

This demand a great effort by all the components of CIMPA, both members and sponsors, either preparing electronic material, recording courses that will be put online, following students remotely. Also, financially, new challenges are under demand: it is necessary to help host institutions and to





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the students with the equipment that will allow them to follow the activities in good conditions. This effort will not be useless, and when it will be possible to resume face-to-face activities, CIMPA will take advantage of this new knowledge to improve their programs and help developing research in mathematics.