

## **SPANISH COOPERATION ON MATHEMATICS 2014**

Next activities are reported by Mercedes Siles and Begoña Vitoriano, secretary and president of the Commission for Development and Cooperation of the CE-MAT (Spanish Committee of Mathematics). We are sure that they are not all the Spanish cooperation developed in Mathematics with developing countries, but it can be seen a good approximation.

As a general framework of cooperation, it should be remarked that Spain through the Ministerio of Economía y Competitividad is one of the supporters of CIMPA, and the different Spanish mathematical societies are member of CIMPA.

Five of the schools approved by the CIMPA for 2014 had a responsible person (not local Spanish; they were: Benin, Jorge Jimenez, University of Valladolid; Mexico, Felipe Cano, University of Valladolid; Laos, Oriol Serra, Polytechnic University of Catalonia; Pakistan, Teresa Seara, Polytechnic University of Catalonia; Morocco, Mercedes Siles, University of Málaga. There were also Spanish presence (lecturers and/or members of the scientific committee) in schools approved for Ivory Coast, Colombia and Algeria.

### **LATINAMERICA**

#### **1) Spain-Central America**

The PhD programme on Mathematics began this year in Panamá.

It is an ambitious programme in the Central-American region, putting together all their forces (PhDs in Panamá, El Salvador, Guatemala, Nicaragua, Honduras, Costa Rica and Dominican Republic). Several difficulties have to be solved because the different regulations of PhD studies in the different countries, but it looks that finally is going to be a reality, beginning in University of Panamá in 2014, with students and professors from different countries. In El Salvador, there are new unexpected difficulties since the Education Ministry is more thinking in a national programme, but with only two PhD professors...

Red GIRA is a network of universities from Madrid and some countries of Central America and Caribe based on existing projects. Universities from El Salvador (Universidad de El Salvador), Nicaragua (Universidad de León), Honduras (Universidad de San Pedro Usula), Guatemala (Universidad de San Carlos), Costa Rica (Universidad de Costa Rica), Madrid (Universidad Complutense, Universidad de Alcalá)... The network is not specific for mathematics, but this is one of the main topics of the cooperation developed until now.

#### **2) Spain-El Salvador**

In 2014 the two master programmes (one in Statistics and another one in Pure Mathematics) have been being taught. It is the fifth edition of the Master of Statistics, and the first one of the

Master of Pure Mathematics. They are mainly supported by lecturers of Complutense University of Madrid, but staff of several universities from all around Spain collaborates in it (Elche, Alicante, Seville, Oviedo), and even from other countries (Italy). Both masters economically are mainly supported by Universidad de El Salvador, with some collaboration of Complutense University. The participation of Spanish lecturers in the Master of Statistics currently is very short (6 of 18 lecturers), since the transfer is almost complete.

In August 2014, Begoña Vitoriano had a meeting with the new Education Minister of El Salvador, who asked for cooperation to support master programmes in the Universidad de El Salvador in other areas (following the successful experience developed in Mathematics). However, since that meeting more information has not arrived from the Ministry or the UES. Talking about the PhD programmes, since the Minister was new in charge, he was not really informed about the situation. Begoña Vitoriano will visit El Salvador again in summer 2015, and she will try to collect more information about it.

### **3) Spain-Panamá**

There was a pre-CIMPA research school in Coclé, Panama (21-25 July 2014). The title “Non-commutative algebra”. The Spanish speakers were: Cándido Martín González, Dolores Martín Barquero and Mercedes Siles Molina, all of them from the University of Malaga.

After the school, Siles Molina was also in Chiriquí, Panamá, invited by Prof. Javier Torres, where she spoke about EMALCA and CIMPA’ schools and about the organization of master and doctorate in Spain.

A CIMPA research school will take place in Coclé in October (from 19-28). See: <http://agt2.cie.uma.es/precimpa14/index2.htm>

### **4) Spain-Cuba**

In 2014 it was prepared a proposal of a CIMPA research school to be held in Santiago de Cuba in 2015. The school was approved by the CIMPA in January 2015. The Spanish organizer was José Antonio Carrillo de la Plata. Siles Molina collaborated with the organisers in preparing the application.

### **5) Spain-Colombia**

In July 2014, from 13-26, a CIMPA research school took place in Villa de Leyva, Colombia. The CIMPA responsible was Siles Molina. Complete information can be found here:

<http://cimpa-icpam.org/ecoles-de-recherche/previous-programmes/ecoles-de-recherche-2014/liste-chronologique-des-ecoles-de/article/real-algebraic-geometry>

## 6) Spain-Latin-America

Complutense University of Madrid organises yearly a Latin-American Complutense School in some country of Latin-American. These schools are of 2 weeks of duration and 50 hours (5 hours by day), taught by 2 lecturers of Complutense and 2 lecturers from the host university, and including grants for students coming from other countries. Usually, there are around 12 or 15 different courses of different topics. In 2015, it will be the 20<sup>th</sup> edition in Puebla (Mexico).

In 2012 and 2013, in Universidad de Buenos Aires (Argentina) the next course was taught: *Mathematical modelling and simulation. Methodology for its computer implementation. Applications to Physics, Biology and Finance*. Begoña Vitoriano was the organiser from Complutense University, and lecturer. In 2014, in Puebla (Mexico), the next course was taught: *Mathematical Modelling for high school teachers*.

## 7) Spain-Ecuador

The Ecuadorian government has signed an agreement with the Complutense University for it imparts the Master in Teacher Training in Ecuador, taught at the university in Spain. In Spain this kind of Master is required to practice as a teacher in middle and high school, and Ecuador is following the model. This year 2015 is being conducted for the first time in Ecuador (Quito and Cuenca). It includes math courses taught by professors from the Faculty of Mathematical Sciences at the Complutense University. Begoña Vitoriano is as first alternate for one of these courses (Calculus, Probability and Statistics), which will be held in July-August 2015.

## AFRICA

### 8) Spain-Senegal

Spain's relations with Senegal, in particular University of Dakar, started several years ago. The Master on Algebra, Geometry and Applications (MAGA) continues, with the 2013/2014 course the third edition. It involves the University of Dakar (UCAD) and different Spanish universities (Malaga, Granada, Almeria, Valladolid, etc.).

From 9-12 April 2014 took place the "II Encuentro de redes y grupos temáticos de Matemáticas. XII Jornadas de Álgebra no conmutativa" at the University of Málaga. Two professors from Senegal participated in this meeting: Mamdou Sangharé, responsible of AIMS-Sénégal and Anta Niane Gueye. It was organized by the group Gauss of Algebra of the University of Málaga (see <http://jornadasncalg.uma.es/index.htm>).

From 23-25 May 2014 there was a workshop in Dakar to honor Professor Amin Kaidi. It was organized by Senegal and Spain. The participation of international researchers included the Field Medallits Efim Zelmanov (by video-conference), Ivan Shestakov, Consuelo Martínez, etc. See: <http://workshop2014.lacgaa.com/committees/>

There is also Spanish presence in PhD dissertations in Senegalese universities, and joint organisation of scientific activities are being prepared, as two conferences in which organizers and scientific committees include Spanish and Senegalese lecturers.

### **9) Spain-Morocco**

In September 2014, 8-17, took place the CIMPA research school organized by Professors Nadia Boudi (from Mekness University) and Mercedes Siles Molina (who was also the CIMPA responsible of that school). See the information and reports here:

<http://cimpa-icpam.org/ecoles-de-recherche/previous-programmes/ecoles-de-recherche-2014/liste-chronologique-des-ecoles-de/article/operator-theory-and-the-principles-581>

### **10) Spain-Mozambique**

The main project related to Mathematics is the Master on Statistics of the Universidade Pedagógica of Mozambique, with academic coordinator Spanish (Begoña Vitoriano) and all lecturers Spanish. In 2012-2013 were taught the courses of the first edition, supported by Complutense University, CIMPA and Universidade Pedagógica. 4 Master theses have been defended until now, and 2 of these students are in Spain following master programmes (to begin PhD studies next year). In 2014, a new edition has begun including 15 courses in 2014 and 5 courses in 2015. Financial support in 2014 was by Complutense University of Madrid, CIMPA, University of Seville and Universidade Pedagógica.

Also, in 2014 was the opening ceremony of the new research institute C-DATA, focused on teaching and applications of statistics, with the attendance of representing people (Consul) of the Spanish Embassy. Begoña Vitoriano (included in the research group) was one of the speakers in this ceremony.

Finally, an African Mathematical School is being prepared by Universidade Pedagógica for next year 2016. The topic will be related with statistics and operational research, focused on applications. This is not yet well developed the idea, but it could be in relation with application to natural disaster management, since a proposal for a European Project in the topic is being prepared including to the Universidade Pedagógica, the Mozambican Institute for Disaster Management...

### **11) Spain-Angola**

IEPALA, an organisation for development, is in contact with Complutense University with the idea of creating in Angola a College to teach advanced courses of the Complutense University. The organisation counts with the support of the Angolan Government (also economic support). They contacted with Begoña Vitoriano in September 2014 to support the creation and

development of the centre in some scientific areas. Until now, new information has not arrived. The Vice-chancellor of Complutense University in charge of foreign affairs and cooperation for development reported that the proposal is in development, and it is not yet clear the support of Complutense University for this kind of centre in Angola.

## **ASIA**

### **12) Spain-Palestine**

A CIMPA research school entitled "Random structures, Analytic and Probabilistic Approaches" took place in Palestine from 18-26 August 2014. The CIMPA responsible was Mercedes Siles Molina. See here the information concerning the school and the report by the CIMPA responsible, respectively:

<http://lipn.univ-paris13.fr/~nicodeme/nablus14/>

[http://cimpa-icpam.org/IMG/pdf/Rapport\\_Palestine%20msm.pdf](http://cimpa-icpam.org/IMG/pdf/Rapport_Palestine%20msm.pdf)

### **13) Spain-India and West Asia**

In this region develops a broad activity Professor Jorge Jimenez Urroz, of the Polytechnic University of Catalonia and Scientific responsible of CIMPA. These activities are conducted primarily in India, Iraq, Pakistan and Turkey.

### **14) Spain-Indonesia**

From October to December 2014, Prof. Khurul Wardati, from Universitas Gdjah Mada in Yogyakarta, Indonesia, was staying at the University of Malaga under the supervision of Siles Molina. Wardati is preparing her PhD.