

Some examples of interactions between Mathematicians from France and African countries

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The close connection between French and African mathematicians has a long history. PhD training and joint research activities have been particularly intense in the last two decades.

Several CIMPA (International Center for Pure and Applied Mathematics) research schools are organized in African countries every year, as well as African Mathematical Schools (intensive Master level courses coorganized by CIMPA and the African Mathematical Union).

During the period 2004--2008, the French Ministry of Foreign Affairs devoted a substantial financial support to the French-African cooperation in Mathematics and Computer Science. This was the start of SARIMA (Support for Research Activities in Mathematics and Computer Science in Africa), which is an organization which coordinates those cooperations. Although the financial support is no longer available, SARIMA remains active, see <http://sarima.edu-math.org>.

SARIMA coordinates the interactions of several French universities and CIMPA with sub-saharan African universities and mathematicians. At least 45 sub-Saharan Phd students, supervised or co-supervised by French mathematicians, have defended their thesis since 2009. Most of them became University Professors in their home country. Given the African demography, forming the next generation of African mathematicians is an important and exciting challenge.

A few Master programs have been initiated with the help of the French and international mathematical community. This includes a Master program specialized in cryptography in Dakar, three Master programs in Statistics applied to life sciences in St Louis (Senegal), Cotonou (Benin) and Yaounde (Cameroon) see <http://samm.univ-paris1.fr/STAFV-Statistique-pour-l'Afrique>, and finally one Master 2 program in Probability and Statistics with applications to life sciences in Abidjan, see <http://m2psav.master.edu-math.org>. Most of these programs run independently of international support after a few

years. The one in Abidjan started in 2013 and runs every other year. Out of the first two classes, 5 students are preparing a Phd. A new class started in October 2017 with 6 students, selected via a written exam from 4 different countries (Cameroon, Ivory Coast, Senegal and Togo). This year, two of the four courses which are taught by non-local instructors, will be taught by colleagues from other African countries.

Presently there is a small number of projects of MOOCs realized by a French-African duo. One of those projects should come out in January 2019.

Note that while our interactions concern mainly French speaking African countries, there have been several CIMPA research schools in English speaking countries. We are now trying to help the University of Ghana in Accra to improve its education at the Master level. One instructor from Aix-Marseille University has spend some time in Accra in October 2017, having the Master 1 students doing exercises. This will continue during the coming year via internet. Students having reached a high enough level at the end of the year, will be proposed to follow a second year of specialization in France (or elsewhere in Europe), with the idea of having them preparing a Phd later, with a cosupervision by a Ghanaian and a French (or European) instructor.

One important recent evolution in research in Mathematics in Africa is the new financial support which it receives directly from international organizations. A network of African Institutes of Mathematical Sciences has been created in Cameroon, Ghana, Rwanda, Senegal, South Africa and Tanzania, which organize one-year teaching programs for selected students at the Master level, with the financial support of NGO's and Canadian and German agencies. The Simons foundation supports three research networks involving several African countries. The World Bank supports several African Centers of Excellence, three of them in Mathematics and Computer Science are based in Senegal, Benin and Cameroon. The African Millenium Mathematical Science Initiative distributes a good number of stipends to Master students over Africa and supports research. The members of SARIMA are fully convinced that the development of such initiatives in interaction with the international mathematical community is essential for the future of Mathematics research in Africa, in particular for the education of young researchers, either during the preparation of their Phd, or at the post-doctoral level.