

## My collaborations with colleagues in France

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## Plan

- ### 3 Collaborations with researchers from France

## Some personal information

- Gabonese, lecturer at Université des Sciences et Techniques de Masuku (USTM) in Franceville (Gabon) since 2011.
- Born in Libreville in Gabon, I did all my studies in Gabon until my Master1 at USTM in 2004. Then I moved to Université Paul Sabatier Toulouse III in France to complete a Master2's degree in 2006 and my PhD thesis defended on 5 May 2010, my webpage <https://sites.google.com/site/ezometony/home>
- Member of the Committee for Women in Mathematics CWM of the International Mathematical Union (IMU).
- Member of the International Centre CIMPA.
- Head of the Pole of Research in Mathematics and Applications in Africa (PREMA)
- Member of steering committees of 4 projects funded by CNRS and INRIA in France.
- Regular associate to ICTP in Italy.
- Leibniz fellow at Oberwolfach in Germany.

## PREMA: a Network of African Mathematicians

- ① With the help of African colleagues I met during my PhD in France, Jean-Marc Couveignes (Univ of Bordeaux) my PhD advisor, Marie-Françoise Roy (Univ of Rennes) a former member of CIMPA in charge of Sub-Saharan Africa, I created the Pole of Research in Mathematics and Applications in Africa (PREMA) on 16 January 2012 (<https://www.prema-a.org>) to organize Mathematical events in Africa, advise PhD students, and try to solve interesting mathematical problems.
- ② Research topics in PREMA are Number Theory, Algebraic Geometry, Constructive Algebra, mathematical aspects of Public-Key Cryptography, Real Algebraic Geometry and its applications to robot kinematics.
- ③ Since April 2018, Christian Maire (Univ Franche-Comte) helps us to implement within PREMA a Competitive Research Team on Number Theory and Arithmetic Geometry. Also Cecile Armana (Univ Franche-Comte) and Elisa Lorenzo (Univ Rennes) help us.

## A progress report from PREMA

- In the begining, 12 members from 4 countries (Cameroon, Gabon, Madagascar and Senegal), only three women. Since 2018, we welcame Burkina Faso, Niger, Nigeria, Tchad, Tunisia; we have collaborators in Congo (Brazzaville), Ghana and Mali. All in all: more than **60 members (6 women) from 12 countries** .
- Our Women in Maths Section collaborates with African Women in Mathematics Association (AWMA) to reduce gender gap.
- We have been awarded by Simons Foundation in US (2013 - 2021 for grant 670 000 \$), by INRIA (2013 - 2019 for 70 000 €), by CNRS (**Redgate** 2021-2022 for 19 000 €, and **AFRIMath** 2021-2025 for 100 000 €) and by CIMPA (2011-2022 to fund Schools, conferences and teaching stays, more than 80 000 €).
- More than **80 Master** theses defended, **15 PhD** defenses (4 women) co-advised with French colleagues, more than **20 research schools and conferences** , more than **100 papers published** in prestigious journals

## Good collaborations with colleagues in France

- ① 12 among the 15 (who defended their PhD co-avised within PREMA) have been recruited in African universities to reinforce teams of the Mathematics Departements. Two of them have been awarded by Ecole Normale Supérieure ENS Paris in France, and Carleton University in Canada for research stays supervised by Damien Vergnaud (France) and Daniel Panario (Canada).
- ② French colleagues say that collaborations with us allow them to discover new approaches for solving mathematical problems.
- ③ Collaborations with colleagues in France actually allow us to have a good and active research activity. In particular, [AFRIMath](#) and [Redgate](#) projects funded by CNRS allow us to pay flight tickets and accomodation of PhD students for stays in order to implement a Research Team in Algebra, Geometry and Number theory in Central Africa.

## Some needed improvments

To do maths serenely, one just needs a good library, a computer endowed with a good processor, some important softwares such as Pari/GP, Sage Math and Magma and a good internet access.

- 1 From our fundings (mainly US sponsors), PREMA members have renewed their research equipments. CNRS funds are usually used only for flight tickets, housing and accomodation. Is it possible to get more flexibility, for instance to buy computers and to cover internet connexion?
- 2 Mathematical papers and books are free on some websites. But this requires sometimes professional email adresses (not Yahoo nor Gmail). Is it possible that CNRS provides stable email adresses to African researchers managing projects awarded by CNRS? We also need stable websites. Unfortunately, PREMA website [www.prema-a.org](http://www.prema-a.org) is now funded by ourselves or friends/colleagues from France using their own money.

## Some needed improvements

- 1 Since Covid 19, very heavy procedures to come in France. We paid in advance many things (health insurance, flight tickets, hotel, etc ...), but at the end no visa. I was personally concerned with this situation when I tried to go to work with J.-M Couveignes in September 2021. One of our PREMA PhD student co-advised by C. Maire faced the same situation three weeks ago.
- 2 Some African countries have already research centers such as AIMS Centers, ICTP centers or World Bank Excellence Centers. These centers have good IT service and good internet connexion. Is it possible that CNRS helps researchers who have not such centers in their country by implementing small rooms offering good working conditions. To do this CNRS can collaborate with UNESCO, UNDP, French Embassies, Institut Français, Agence Française de Développement (AFD), ... Very useful either to solve problems with visa or in case of pandemics where people cannot move between continents nor countries.



## Some needed improvements

Once your project is selected, you start facing new kind of problems: how to receive and expense the awarded funds.

There is no problem for African countries having AIMS Centers, ICTP centers or World Bank Excellence Centers. But others face many problems to expense money in an efficient way.

For instance, we have a lot of zoom meetings with C. Maire and C. Armana concerning the organization of *AFRIMath Conference* which will take place from 5 to 20 December 2022 in Gabon.

CNRS usually says that *all expenses could be made directly from France*. In practice, this is *very complicated and not realistic*.

Everything (flight tickets, housing and accommodation, etc ..) then become very expensive. And hence we cannot fund all the planned activities. Sometimes colleagues have to pre-fund but reimbursements are not trivial. PhD students cannot pre-fund (no fellowship).

Thank you!