

Arithmetic and Geometry in Central Africa

Recherche et Encadrement Doctoral
en Arithmétique et Géométrie Appliquées
en Afrique Centrale (REDAGAAC)

<https://redagaac.math.cnrs.fr>

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Coordinators

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- Cécile Armana, Associate Professor, University Marie and Louis Pasteur (UMLP), Besançon, France
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Goal: To develop Arithmetic Geometry and Applications in Africa.

This involves researchers, postdocs, and PhD students from Africa (namely Burkina Faso, Cameroon, Congo Brazzaville, Gabon, Ghana, Ivory Coast, Mali and Senegal) as well as researchers from Europe and North America (France, The Netherlands, UK, USA).

The preliminary step via PREMA

- African PhD students in France from 2009 to 2011 created the **Pole of Research in Mathematics and Applications in Africa (PREMA)** on 16 January 2012 with the help of Jean-Marc Couveignes and Marie-Françoise Roy.
- PREMA has been selected twice by Simons Foundation for grants (May 2013 - April 2018 and May 2018 - April 2023).
- From 2012 to 2021, research topics in PREMA were: *Number Theory, Algebraic Geometry, Constructive Algebra, Cryptography, Real Algebraic Geometry and its applications to robot kinematics.*
- Since December 2021, PREMA project became REDAGAAC. Our activity now focuses on *Arithmetic Geometry and Applications.*

The second step with REDAGAAC

PREMA had to evolve following two major events in 2020:

- Termination of Simons support, and
- COVID-19.

Our actions with REDAGAAC since 2021:

- Organization of several events focusing now on algebra and arithmetic. These events have evolved.
- Africa/West and Africa/Africa visits.
- Supervision of PhD theses. 5 PhD defenses are scheduled in the next 12 months.
- Online seminars (~ 10 /year).
- Creation of a website.
- Seeking new partners: ICMS, IHES, AUF, LMS, etc.

Our achievements

January 2012 to December 2024

- More than **80 Master** theses defended, **18 PhD** defenses (4 women) co-advised with French colleagues.
- 15 among the 18 (who defended their PhD) have been recruited in African universities (namely in Cameroon, Mali and Senegal) to **reinforce teams in Mathematics Departments**.
- More than **20 research schools and conferences**.

Our main recent partners



What we need

- Set up an association located in Gabon.
- A physical space in Libreville dedicated to our project.
- Administrative support during events organized in Africa.
- Funding:
 - for PhDs and postdocs,
 - for workshops,
 - for Africa/West and Africa/Africa visits.
- Stability of funding over 3-4 years.

Dream/Goal:

**Create a mathematics research hub in Gabon
aligned with international standards.**