# Arsene-Brice Zotsa-Ngoufack, Ph.D.

✉ arsene-brice.zotsa-ngoufack@univ-amu.fr
🌐 google page    🌐 My home page    🌐 Researchgate page

## Research Interets

🔖 **Asymptotic behavior of PDE, Stochastic epidemic, Stochastic particles systems, Branching Process, SPDE, Hawkes Process, Actuarial science, Statistic, Functional Analysis, Complex Analysis.**

## Education

| | |
|---|---|
| April 2021 –September 2024 | 🔖 **Ph.D in mathematics, Aix-Marseille Université:** Institut de Mathématique de Marseille, France. <br> **Thesis title**: *Stochastic epidemic model with varying infectivity and waning immunity. Weighted norm inequalities in the variable exponent Lebesgue spaces for Bergman projector on the unit ball of $\mathbb{C}^n$.* <br> **Advisor**: *Professor Raphael Forien and Professor Etienne Pardoux.* |
| 2019 – 2020 | 🔖 **Master's degree in Probabilities-Statistics apply in Biology,** Université Félix Houphouet Boigny d'Abidjan, Côte d'ivoire . <br> **Master thesis title**: *Generalizations of stochastic epidemic models.* <br> **Advisor**: *Professor Raphael Forien and Professor Etienne Pardoux.* |
| 2013 – 2019 | 🔖 **Master's degree in Mathematics, University of Yaounde I, Cameroon**. <br> **Master thesis title**: *Generalization of the properties of classical Bergman spaces to variable exponents Bergman spaces.* <br> **Advisor**: *Professor Edgar Tchoundja.* |

## Grants

| | |
|---|---|
| September 2024 | 🔖 Conference on new developments in Probability : $1650 CAD. |
| July 2024 | 🔖 CRM-PIMS Probability summer school : $800 CAD. |
| April-May 2023 | 🔖 FRQ support for the CRM-CNRS international research lab: $5000 CAD. |
| November 2021-October 2024 | 🔖 Contrat doctoral Aix-Marseille Université: €60000. |
| October 2021 | 🔖 EMS-SIMONS for Africa, $3200 USD (declined). |
| 2020 | 🔖 Master 2 scholarships: institut Archimède Mathématiques-informatique, Aix-Marseille Université: €5000. |
| 2019-2020 | 🔖 Bourse Master M2PSAV : €2000. |
| 2019-2022 | 🔖 Cameroonian government scholarship to the CAPESA statistics schools, ISE, ENSEA Abidjan : 4000000 FCFA (declined). |
| 2017-2019 | 🔖 Paul Biya Excellence Scholarship, 150000 FCFA. |

## Research Publications

### Journal Articles

1. **Arsene-Brice Zotsa-Ngoufack**, "Functional central limit theorem for stochastic epidemic models with varying infectivity and waning imunity," *arXiv preprint: 2311.02260 under revision in ESAIM PS,* 2024[+].

**2** R. Forien, G. Pang, É. Pardoux, and A.-B. **Zotsa-Ngoufack**, "Stochastic epidemic models with varying infectivity and susceptibility," *arXiv preprint: 2210.04667 under revision in the Annals of Applied Probability journal*, 2023$^+$.

**3** D. Békollè, E.-L. Tchoundja, and A.-B. **Zotsa-Ngoufack**, "Weighted norm inequalities in the variable lebesgue spaces for the bergman projector on the unit ball of $\mathbb{C}^n$," *arXiv preprint: 2303.07553 to appear in Transactions of A. Razmadze Mathematical Institute*, 2023.

### Works in progress

**1** R. Forien and A.-B. **Zotsa-Ngoufack**, "Cyclic behavior for stochastic epidemic models with varying infectivity and waning imunity," ***Work in progress***, 2023.

**2** H. Guérin and A.-B. **Zotsa-Ngoufack**, "Stochastic epidemics models with memory on the previous infectivity and immunity," ***Work in progress***, 2023.

## Visiting

April-May 2023: Université du Québec à Montréal (UQAM), funded by a FRQNT grant supporting research mobility for the IRL CRM-CNRS.

## Conferences

- **Conference on new developments in Probability,** Montreal, September 2024
  *Status:* Speaker
  *Subject:* Stochastic epidemic model with varying infectivity and waning immunity.

- **CRM-PIMS Probability summer school 2024** , Montréal, Canada
  *Status:* Speaker
  *Subject:* Stochastic epidemic model with varying infectivity and waning immunity.

- **European Summer Program in Infectious Disease Analysis and Modelling (ESPIDAM)** , Stockholm, June 2024

- **Conference on spatial Epidemic models, Rice University,** May 2024
  *Status:* Speaker
  *Subject:* Stochastic epidemic model with varying infectivity and waning immunity.

- **JPS-2023:** Colloque Jeunes Probabilistes et statisticiens, France, Ile d'Oleron
  *Status:* Speaker
  *Subject:* Stochastic epidemic model with varying infectivity and waning immunity.

- **SPA conference 2023**, Lisboa,
  *Status:* Speaker
  *Subject:* Stochastic epidemic model with varying infectivity and waning immunity.

- **Saint-Flour (France)** Summer school, July 2023,
  *Status:* Speaker
  *Subject:* Stochastic epidemic model with varying infectivity and waning immunity.

- **Workshop**: Probability meets Biology II, University of Bath, June 2023,
  *Status:* Speaker
  *Subject:* Stochastic epidemic model with varying infectivity and waning immunity.

- Séminaire des doctorants de l'UQAM, Montréal, May 2023
  *Status:* Speaker
  *Course:* Introduction to epidemic models.

- Seminaire Institut Denis Poisson, Orleans, France, Febuary 2023.
  *Status:* Speaker
  *Subject:* Weighted norms inequalities in the variable exponent Lebesgue space for Bergman Projector on the unit ball of $\mathbb{C}^n$.

- Rencontres des Jeunes chercheurs Africains en France, Institut Henry Poincaré (Paris), December 2022,
  *Status:* Speaker
  *Subject:* Stochastic epidemic model with varying infectivity and waning immunity.

- **Sport and IA:** Ecole d'automne sport et intelligence artificielle, Antibes, October 2022.

- **MLISTRAL:** Machine Learning in Insurance Sector Targeted to Risk Analysis and Losses, CIRM, September 2022.

- School on Climate Sensitivity and Workshop on Mathematics and Theorical Physics for Climate Dynamics, Lyon, France, September 2022.

- Seminaire d'Analyse et Geométrie-Institut de mathématiques de Marseille, France, March 2022.
  *Status:* Speaker
  *Subject:* Weighted norms inequalities in the variable exponent Lebesgue space for Bergman Projector on the unit ball of $\mathbb{C}^N$.

- Séminaire internationale d'analyse classique à Yaoundé, December 2021,
  *Status:* Speaker
  *Subject:* Weighted variable inequality for Bergman Projector on the unit ball.

- Conférence internationale de mathématiques du GIRAGA au Cameroun, December 2021
  *Status:* Speaker
  *Subject:* Stochastic epidemic model with waning immunity.

- Conférence de la Chaire Modélisation Mathématique et Biodiversité: Aussois, France, June 2021
  *Status:* Speaker
  *Subject:* Stochastic epidemic model with varying infectivity and waning immunity.

- Conférence internationale de mathématiques au Cameroun parrainé par les universités Saint Cyr de France, 2019-2020
  *Status:* Speaker
  *Subject:* Variable exponent Bergman spaces.

## Teaching experience

2023–2024    **Teaching assistant.** Aix-Marseille Université,

- Financial Mathematic (Master): Pricing, Arbitrary theory, Stochastic calculus,

- Mathematics for Microeconomics (Bachelor),

- Linear Algebra and real Analysis (Bachelor).

2022–2023    **Tutor.** Aix-Marseille Université,
Mathematical tools for physic L2PASS.

2021–2022    **Teaching assistant.** Aix-Marseille Université,
Mathematical language course L1en2ans portail René Descartes, classe inversée (flipped classroom).

# Teaching experience (continued)

2018–2019    **Teaching.** Institut international d'Afrique centrale(IIAC)

- Introduction to Matlab,
- Numerical methods for ODE and application to Matlab.

**Tutor.** ESSFAR Cameroun,

- Real Analysis (Bachelor),
- Linear Algebra (Bachelor).

2016 – 2019    **Tutor.** University of Yaounde 1

- Real Analysis (Bachelor),
- Topology of metric space (Bachelor),
- Differential calculus (Bachelor),
- Integral calculus (Bachelor),
- Complex Analysis (Bachelor).

# Miscellaneous Experience

## Association and responsability

2022–2024    **Representative of p.h.d students of the doctoral school 184 (i.e doctoral school of Mathematics and computer science), Aix-Marseille Université.**

**Co-organizer of Aix-Marseille Université p.h.d student's day.**

December 2022    **Scientific mediation in high schools, Marseille.**

## Research and Development

August 2023    **Treizième atelier de résolution de problèmes industriels de Montréal**
*Organizer:* CRM-IVADO
The objective was to compute the customer life value (CLV) in insurance. To do this we first use regression tree on the data to identify the different group (i.e. the states of the Markov chain) with the profit as a target variable, secondly we estimate the transition probabilities between each group/state and finally we compute the CLV by Monte Carlo method.

May 2022    **Semaine de mathématiques-entreprises, France**.
*Organizer:* AMIES
The objective was to use mathematical tools to propose solutions to business problems. Based on mathematical achievements, we proposed three methods that are less costly in complexity, which we implemented on Python that can allow the Cailabs structure to perform a non-homogeneous smoothing of the light.

# Miscellaneous Experience (continued)

### Professional experiences

March-June 2021    ▉   **Assistant Statistical Engineer, INRAE-France.**

- Development of an application for monitoring an epidemic in real time;

- Collection and processing of data in the application.

### Certification

2023    ▉   **Exam P**. SOA.

# Skills

| | | |
|---|---|---|
| Languages | ▉ | Strong reading, writing and speaking competencies for English, French (Mother tongue), Yemba (Mother tongue), German. |
| Coding | ▉ | Matlab, php, Python, R, sql, xml/xsl, LaTeX, C. |
| Databases | ▉ | Mysql, sqlite. |
| Web Dev | ▉ | Html, css, JavaScript, php,Apache Web Server. |
| Hobbies. | ▉ | Karate, Football, Hiking, Music, Cinema, Game. |