Pierre Amenoagbadji

Postdoctoral researcher
APAM - Columbia University
Born 21/12/1997 in Lomé, TG. Togolese citizenship

APAM, Columbia University
200 S.W. Mudd Building
New York, NY 10027
ka3012@columbia.edu
pierreamenoagbadji.github.io

Education

2020–2023 **Ph.D.** in **Applied Mathematics**, *POEMS team, ENSTA Paris*, Palaiseau, FR.
Thesis defended on December 13, 2023.
- **Title**: Wave propagation in quasiperiodic media.
- **Committee**: David Gérard-Varet (President), Éric Bonnetier and Antoine Levitt (Reviewers), Bérangère Delourme, Sébastien Guenneau, and Claude Le Bris (Examiners), Sonia Fliss and Patrick Joly (Advisors).

2019–2020 **Master** in **Analysis, Modeling, Simulation**, *Université Paris-Saclay*, Palaiseau, FR.
- **Main topics**: Partial Differential Equations, Wave propagation, Numerical Analysis, High Performance Computing.

2017–2020 **Engineering degree** in **Applied Mathematics**, *ENSTA Paris*, Palaiseau, FR.
- **Courses**: Mathematics (analysis, numerical methods, optimization, probability theory), Mechanics (solid, fluids), Physics (quantum, statistical), Computer science (C/C++).

2015–2017 **CPGE**, *Lycée César Baggio*, Lille, FR, PCSI-PSI*.
- Two-year undergraduate intensive courses for nationwide competitive entrance exams to top French engineering schools, also called 'Grandes Écoles'.

2014 **Togolese scientific Baccalaureate**, *Lycée 02 Février*, Lomé, TG.

Research Experience

2024–Pres. **Postdoctoral position**, *Department of Applied Physics and Applied Mathematics, Columbia University*, New York, US.
- **Advisor**: Michael Weinstein.

2020–2023 **Ph.D. student**, *POEMS team*, Palaiseau, FR.

2020 6–**month research internship**, *POEMS team*, Palaiseau, FR.
- **Title**: Wave propagation in quasiperiodic media (introduction to the Ph.D.); advised by Sonia Fliss and Patrick Joly.
- Survey of the theory of almost-periodic and quasiperiodic functions; numerical study of the truncation effects related to cell problems with quasiperiodic coefficients in the homogenization setting; numerical solution of a 1D Helmholtz equation with quasiperiodic coefficients.

2019 3–**month research internship**, *Karlsruhe Institute of Technology*, Karlsruhe, DE.
- **Title**: The Galerkin method for one-dimensional Fredholm integral equations: analysis and implementation on BIEPack; supervised by Tilo Arens.
- Implementation of Galerkin and collocation methods on the Matlab library BIEPack.

Publications

Peer-reviewed journals

[2] P. Amenoagbadji, S. Fliss, and P. Joly. "Time-harmonic wave propagation in junctions of two periodic half-spaces". In: *Pure and Applied Analysis* 7.2 (2025), pp. 299–357.

[1] P. Amenoagbadji, S. Fliss, and P. Joly. "Wave propagation in one-dimensional quasiperiodic media". In: *Communications in Optimization Theory* 2023.17 (2023).

Ph.D. thesis

[1] P. Amenoagbadji. "Wave propagation in quasiperiodic media". PhD thesis. École Doctorale de Mathématiques Hadamard, 2023.

Oral communications

Conferences

05/2025 SIAM DS25 **SIAM Conference on Applications of Dynamical Systems**, Denver, US
in the minisymposium "Recent Advances in Wave Propagation and Dispersive Dynamics"

01/2025 AMS **Joint Mathematics Meetings**, Seattle, US
in the minisymposium "Mathematics of Topological Insulators"

06/2024 WAVES2024 **16th International Conference on Matematical and Numerical Aspects of Wave Propagation**, Berlin, DE

05/2024 SIAM MS24 **SIAM Conference on Mathematical Aspects of Materials Science**, Pittsburgh, US
Invited talk in the minisymposium "Analysis, Homogenization, and Spectral Problems in Materials Science".

09/2022 Conference Aspect'22 **Asymptotic Analysis & Spectral Theory**, *Oldenburg University*, Oldenbug, DE.

06/2022 WAVES2022 **15th International Conference on Matematical and Numerical Aspects of Wave Propagation**, Palaiseau, FR

06/2022 CANUM **45e Congrès National d'Analyse Numérique**, *SIAM*, Evian-les-Bains, FR

02/2022 **Conference on Mathematics of Wave Phenomena**, *KIT*, Karlsruhe, DE (online)

10/2021 CJCMA 2021 **Congrès des Jeunes Chercheuses et Chercheurs en Mathématiques Appliquées 2021**, Palaiseau, FR

06/2021 **10e Biennale Française des Mathématiques Appliquées et Industrielles**, *SIAM*, La Grande-Motte, FR

Seminars, Working groups, Workshops

05/2025 **SAYAS Numerics Day**, *University of Delaware*, Newark, US.

04/2025 **Computational and Applied Mathematics Colloquium**, *University of Chicago*, Chicago, US.

02/2025 **Applied and Computational Mathematics Seminar**, *Rutgers University*, New Brunswick, US.

07/2024 **Simons Collaboration on Extreme Wave Phenomena**, (online).

01/2024 **APAM Colloquium**, *Columbia University*, New York, US.

11/2023 **Séminaire de l'équipe Modélisation et Calcul Scientifique**, *LAGA, Université de Sorbonne Paris-Nord University*, Villetaneuse, FR.

06/2023 AQW2023 **The Arctic Quasiperiodic Workshop**, Luleå, SE (online).

04/2023 **Workshop on Computational Methods for Multiple Scattering**, *Isaac Newton Institute*, Cambridge, UK.

12/2022 **EDP Nancy Seminar**, *Institut Élie-Cartan de Lorraine*, Nancy, FR.

11/2022 **Rencontre JCJC Ondes**, *INRIA Université Côte d'Azur*, Nice, FR.

06/2022 AQW2022 **The Arctic Quasiperiodic Workshop**, Luleå, SE (online).

Posters

02/2025 **Reduced-Order Modeling for Complex Engineering Problems (from Analysis to Practical Implementation)**, Chicago, US.

07/2023 **Mathematical Aspects of Condensed Matter Physics**, Zurich, CH.

Teaching and supervision

Lecturing

Spring 2025 APMA E4301 **Numerical methods for PDEs**, *Columbia University*, Palaiseau, FR, Graduate level.

- Finite differences and finite elements for ODEs and PDEs

Teaching assistantship

2021-2023 MA103 **Introduction to PDEs and their Discretization by Finite Differences**, *ENSTA Paris*, Palaiseau, FR, L3 level, 15h/year.

- Hyperbolic equations, Method of Characteristics, Finite differences.

2021-2022 ANN201 **Finite Elements**, *ENSTA Paris*, Palaiseau, FR, M1 level, 15h/year.

- Elliptic equations, the Finite Element Method.

Internship supervision

Claire Daignan (2023) **Spectral analysis of weighted shift operators**, *ENSTA Paris*, Palaiseau, FR, M1 student advised with Patrick Joly for 10 weeks.

- Spectral properties of weighted shift operators, acting on scalar-valued and periodic functions of several real variables, depending on the properties of the shift.

Collective responsibilities

2024–Pres. **Co-organiser of the Waves Working Group**, with Xuenan Li and Michael Weinstein, New York, US

- Weekly seminars featuring speakers from the field of wave theory.

2022-2023 **Co-organiser of the POEMS team seminar**, with Maryna Kachanovska, Palaiseau, FR

- Bi-weekly seminars featuring speakers from the field of wave theory.

2021-2022 **Buddy program**, *Fondation Mathématique Jacques Hadamard*, Orsay, FR.

- Mentoring of two foreign MSc. students from Université Paris-Saclay.

Spoken and written languages

French Native

Ewe Native

English Professional Proficiency *TOEIC score 990/990 in 2019*

Programming languages and platforms

Computing Matlab, C/C++, XLiFE++

Notions MPI with C/C++, Pascal, Python, html