

KEVISH NAPAL

ML Researcher | École Polytechnique | PhD Applied Mathematics

Global Talent Visa Nov. 2025 - Nov. 2027

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SKILLS

Python	Scikit-learn, Keras, PyTorch, Pandas, Numpy, Matplotlib, Jupyter
Programming	Python, C++, Linux, Git, GCP, BigQuery, Claude Agent SDK, FastAPI, Docker
Mathematics	Machine Learning, Statistics, Probability, Optimization, Functional Analysis, Stochastic Calculus
Languages	French (native), English (C1), Hindi (A1)
Software	Implemented a Monte Carlo Validation Method for Statistical Physics: EffectiveTMatrix.jl ↗

EXPERIENCES

Barnacle Labs Jul. 2025 - present
ML Research Engineer London, UK

- Trained and evaluated machine learning models for patient stratification [[Pytorch](#), [Google Cloud](#)]
- Developed and benchmarked an AI agent for hypothesis generation in oncology [[Claude Agent SDK](#)]
- Built Python pipelines for large-scale biomedical data analysis [[Pandas](#), [SQL](#), [BigQuery](#), [Shell](#)]

Paris Digital Lab, CentraleSupélec Sep. 2024 - May. 2025
Data Scientist - Work-study program focused on leveraging AI to develop industrial solutions La Défense, France

- Worked in cross-functional teams to design and deliver MVPs for corporate partners
- AXA: monitored and analyzed health inflation trends in the UK [[Time Series Hybrid Modeling](#)]
 - Airbus: crack detection on A350 fuselage using photogrammetry [[3D Computer Vision](#), [SLAM](#)]
 - Natixis: AI-driven solution to ensure financial data compliance [[PDF processing](#), [LLM](#), [VLM](#), [RAG](#)]

University of Cambridge, Isaac Newton Institute Jan. 2023 - Jun. 2023
Visiting Scholar to the 6 months research program “Multiple Wave Scattering” Cambridge, UK

- Designed a model for wave propagation in composite materials (work published by the Royal Society) [[Mathematical Modeling](#), [Statistical Physics](#), [Monte Carlo Method](#), [Random Media](#), [Julia](#)]
- Co-organised several events (Winter School, hackathon, talk sessions, minisymposium at the BAMC)

University of Sheffield, DRG Nov. 2021 - Oct. 2023
Research Associate - coll. with Dr. Artur L. Gower Sheffield, UK

- Developed a POC in collaboration with DSTL, using resonator layers for stealth technology
- Simulated wave interference and scattering in random media using EffectiveTMatrix software [[Statistical Physics](#), [Acoustics](#), [Multiple Scattering](#), [Eigenfunction Expansion Methods](#), [Julia](#)]
- co-supervised two PhD students, a research intern and co-organized several events

University of Colorado Boulder, CEAE Jan. 2020 - Jul. 2021
Research Associate - coll. with Dr. Fatemeh Pourahmadian Boulder, Colorado

- Applied inverse problem techniques to localize subsurface defects from scattered wave data
- Developed FEM to solve Biot's equations for crack scattering in poro-elastic media [[NDT](#), [HPC](#), [FEM](#), [Poro-elastic Waves](#), [Geomechanics](#), [Inverse Problems](#), [C++](#), [Matlab](#)]

EDUCATION

École Polytechnique, CMAP Nov. 2016 - Dec. 2019
PhD in applied mathematics / Honors: très honorable avec félicitations du jury Palaiseau, France

- Supervisors: H. Haddar (INRIA), L. Audibert (EDF), L. Chesnel (INRIA)
- Combined PDEs analysis and optimisation techniques for ultrasound imaging of composite materials [[Functional Analysis](#), [PDEs](#), [Optimisation](#), [Variational Methods](#), [Spectral Theory](#), [Inverse Problems](#), [Regularizations](#), [FEM](#), [BEM](#), [SVD](#), [C++](#), [Matlab](#), [Python](#)]

- Advanced Probability, Optimal Control, Inverse Problems, PDEs
- Introductory Research Dissertation supervised by H. Haddar (INRIA)

PUBLICATIONS

- [1] P. Piva, K. Napal, A. Gower, Acoustic waves in a halfspace material filled with random particulate, New J. Phys, 2024.
- [2] K. Napal, P. Piva, A. Gower, Effective T-matrix of a cylinder filled with a random 2D particulate, Proceedings of the Royal Society A, 2024.
- [3] F. Pourahmadian, K. Napal. Poroelastic near-field inverse scattering. Journal of Computational Physics 455 (2022): 111005. (Impact Factor: 4.645 in 2021)
- [4] K. Napal, L. Chesnel, H. Haddar, L. Audibert, Qualitative indicator functions for imaging crack networks using acoustic waves, SIAM J. Sci. Comput., vol. 43, 2:B271-B297, 2021.
- [5] K. Napal, L. Chesnel, H. Haddar, L. Audibert, Detecting sound hard cracks in isotropic inhomogeneities, Advances in Acoustics and Vibration II. ICAV 2018. Applied Condition Monitoring, Springer, pp.61-73, 2019.
- [6] Kevish Napal., On the use of sampling methods and spectral signatures to identify defects in inhomogeneous media. Analysis of PDEs [math.AP]. Université Paris Saclay (COMUE), 2019. English. <NNT : 2019SACLX102>. <tel-02885422>. (Phd Thesis)
- [7] K. Napal, L. Chesnel, H. Haddar, L. Audibert, Crack monitoring using transmission eigenvalues with artificial backgrounds, Waves conference, Vienna, August 2019.

SCHOLARSHIPS AND GRANTS

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| • Fondation Mathématique Jacques Hadamard (9k EUR) | Sep. 2024 - Mar. 2025 |
| • Defence and Science Technology Laboratory (4k GBP) | Jul. 2022 - Aug. 2022 |
| • UK Research and Innovation (51k GBP) | Nov. 2021 - Oct. 2023 |
| • US National Science Foundation (62k USD) | Jan. 2020 - Jul. 2021 |
| • Fondation Mathématique Jacques Hadamard (72k EUR) | Nov. 2016 - Dec. 2019 |

TEACHING EXPERIENCE

- **Mentor during a scattering hackathon (Isaac Newton Institute, March 2023):**
I helped 30 PhD students get their hands on the Julia programming language during the hackaton “Beam Challenge” organized by A. Gower and S. Hawkins at the “Multiple Scattering Winter School” [↗](#).
- **Masterclass:** “Detection and quantification of small cracks aggregates using artificial backgrounds”, Society of Engineering Science Conference, University of Colorado Boulder (2020).
- **Teaching Assistant for bachelor level subjects at Sorbonne Université (2016-2019):**
 - Numerical methods for differential equations with Python (2016-2018)
 - Error-correcting codes & Cryptography (2018-2019)
 - Mathematical symbolic computation with Wolfram Alpha (2016-2018)
 - Coached students for mathematics oral examinations as part of competitive entrance preparation for French engineering Grandes Écoles (2016-2017)

TALKS

Statistical parameters of random particulate materials on wave propagation

August 2023, Waseda University, Tokyo.

Theory of wave scattering in complex and random media

March 2023, Isaac Newton Institute, Cambridge.

CNRS-Imperial Metamaterials Conference

September 2022, Imperial college of London.

International Conference on Mathematical and Numerical Aspects of Wave Propagation

August 2019, Vienna University.

Applied Inverse Problems Conference

July 2019, Institut Fourier, Grenoble.

Engineering Mechanics Institute Conference

June 2019, Caltech.

CNRS colloquium MecaWave

November 2018, Fréjus.

PhD students workshop

June 2018, École Polytechnique.

International Conference on Accoustic and Vibrations

March 2018, Hamamet.

STUDENT SUPERVISION

PhD students

- Paulo Sergio Piva (Nov. 2021 - Oct. 2023) [!\[\]\(39e79a92faddb6446b52e85f72c85198_img.jpg\)](#)
- Aristeidis Karnezis (Nov. 2021 - Oct. 2023) [!\[\]\(78e636b30d0a5a7aa997da8876eb2931_img.jpg\)](#)
- Jian Song (Jan. 2020 - Jul. 2021) [!\[\]\(09b1c85105511f55ad018cd15d3969d1_img.jpg\)](#)

Research intern (funded by DSTL)

- Arjun Niranjana (Jul. 2022 - Aug. 2022) [!\[\]\(94c04a5e8e7b3269dd6cea1792ca5aaf_img.jpg\)](#)

COLLABORATORS AND OTHER AFFILIATIONS

Collaborators

- A. L. Gower, Department of Mechanical Engineering, University of Sheffield, UK. [!\[\]\(84c7294e88a45ff42841b46282168b10_img.jpg\)](#)
- L. Audibert, Department PRISME, EDF R&D, 6 quai Watier, 78401, Chatou CEDEX, France. [!\[\]\(51afd05035c1cda4306fbfe9762ecb88_img.jpg\)](#)
- L. Chesnel, UMA, INRIA, ENSTA Paris, Institut Polytechnique de Paris, Route de Saclay, 91128 Palaiseau, France. [!\[\]\(71e37632d94a442ee06a490c6f474d50_img.jpg\)](#)
- F. Pourahmadian, Department of Civil, Environmental & Architectural Engineering, University of Colorado Boulder, USA. [!\[\]\(a9b73b11395935fdbfca5666501d3f3f_img.jpg\)](#)

Graduate Advisor

- H. Haddar, UMA, INRIA, ENSTA Paris, Institut Polytechnique de Paris, Route de Saclay, 91128 Palaiseau, France. [!\[\]\(389b5f9f05a82dacd8021615f1382c04_img.jpg\)](#)

LEADERSHIP

- I co-organized **Exploring STEM for Girls outreach event** (event held annually as part of British Science Week to inspire the next generation of female scientists and engineers through a variety of interactive experiments, demonstrations).
- I successfully secured funding for a 2-month summer studentship from DSTL (Defence Science and Technology Laboratory). Only 3 projects were selected from all submitted projects throughout the UK.
- I co-organized the minisymposium **Multiple wave scattering** at the British Applied Math Colloquium held in Bristol in April 2023. [!\[\]\(a22ba4e13c745edbf29e51af246c4c12_img.jpg\)](#)

INTERESTS

- Member, Mouvement Européen France - contributed to civic initiatives promoting European cooperation and public dialogue.
- I am particularly interested in AI ethics from a sociological perspective: how machine learning systems become embedded in institutions, shape decision-making processes, and affect questions of trust, responsibility, inequality, and human agency.
- Wildcamping, flamenco guitar player, swimming, chess (1200 Elo)