

Eloi MARTINET

Current situation

2024 - **Post-doc in Variational methods in Machine Learning, JMU, Würzburg, Germany.**

Publications and preprints

- 2025 **Spherical caps do not always maximize Neumann eigenvalues on the sphere**, with Dorin Bucur, Richard S. Laugesen and Mickaël Nahon, Geometric and Functional Analysis.
- 2025 **Meshless Shape Optimization using Neural Networks and Partial Differential Equations on Graphs**, with Leon Bungert, Scale Space and Variational Methods in Computer Vision.
- 2024 **Sharp inequalities for Neumann eigenvalues on the sphere**, with Dorin Bucur and Mickaël Nahon, Journal of Differential Geometry.
- 2024 **Numerical optimization of Neumann eigenvalues on the sphere**, Journal of Computational Physics.
- 2023 **Maximization of Neumann Eigenvalues**, with Dorin Bucur and Edouard Oudet, Archive for Rational Mechanics and Analysis.

Conferences, workshops and seminars

- 2026 **Shape Optimization, Geometric Inequalities and Related Topics**, Centro Congressi Federico II, Naples.
- 2025 **Meeting of the ANR Stoiques**, Sorbonne, Paris.
- 2025 **Mathematics of Machine Learning 2025**, Hamburg, (poster session).
- 2025 **ENUMATH 2025**, Heidelberg.
- 2025 **CalcVarNL 2025**, Roermond.
- 2025 **Synergies of Machine Learning and Numerics**, Osaka.
- 2024 **MIPA Seminar**, MIPA, Nîmes.
- 2024 **Seminar Mathematics of Machine Learning and Applied Analysis**, JMU, Würzburg.
- 2024 **Partial Differential Equations seminar**, IECL, Nancy.
- 2023 **POEMS seminar**, ENSTA, Paris.
- 2023 **Calculus of Variations and Applications**, Université Paris Cité, Paris.
- 2023 **Partial Differential Equations seminar**, IRMA, Strasbourg.
- 2023 **Shape Optimization, Geometric Inequalities and Related Topics**, Dip. Mat. Appl., Naples.
- 2021 **Meeting of the ANR SHAPO**, Autrans.
- 2019 **EDPs2 discussion group**, USMB, Chambery.

Research Stays

2025 **One-week invitation from Martin Rumpf and Christoph Smoch**, Bonn, Germany.

Teaching

- 2025-2026 **PDEs on Graphs**, *JMU*, Würzburg.
- 2025 **Project of Machine Learning**, *JMU*, Würzburg.
- 2025 **Lectures on Finite Elements Methods and Physics Informed Neural Networks**, *JMU*, Würzburg.
- 2024-2025 **Lectures and exercises on Introduction to Data Science**, *JMU*, Würzburg.
- 2024-2025 **Seminar of Introduction to Machine Learning**, *JMU*, Würzburg.
- 2024 **Lectures on Finite Elements Methods and Physics Informed Neural Networks**, *JMU*, Würzburg.
- 2024 **Seminar of Machine Learning on graphs**, *JMU*, Würzburg.
- 2022-2023 **Tutoring of practical sessions of Fourier Transform and Numerical Analysis**, *ENSIMAG*, Grenoble.
- 2021-2022 **Tutoring of practical sessions and courses of Basic Analysis**, *UGA*, Grenoble.
- 2019-2020 **Tutoring of practical sessions of Numerical Analysis**, *USMB*, Chambery.

Supervision

- 2025 **Supervision of Jana Bardoz, student assistant**, *JMU Würzburg student*.
- 2025 **Co-supervision of the MSc Internship of Nick Burk**, *JMU Würzburg student*, with Leon Bungert.
- 2024 **Co-supervision of the MSc Internship of Nicolas Roblet**, *ENSIMAG student*, with Romain Joly.

Outreach

- 2025 “**Machine Learning on Graphs**”, *one week project for high schoolers*, *JMU*, Würzburg, Germany.
- 2025 “**Comment les machines apprennent-elles ?**”, *for teachers*, Collège Maurice Clavel, Avallon, France.
- 2025 “**Maths et Machines**”, *for middle and high schoolers*, Collège Maurice Clavel and Lycée des Chaumes, Avallon, France.
- 2023 “**What is it to be a PhD student ?**”, *for high schoolers*, LJK, Grenoble, France.

Administrative responsibilities

- 2024- **Organization of the team seminar of Mathematics of Machine Learning and Applied Analysis**, *JMU Würzburg*.

Grants

- 2024 **JMU Seed Grant**, *JMU Würzburg*.
11.000€

Education

- 2019-2023 **PhD in spectral shape optimization**, *LAMA*, Chambery, Under the supervision of D. BUCUR and E. OUDET.
- 2020-2021 **Master's degree "Préparation à l'agrégation"**, *UGA*, Grenoble, Ranked 88.
- 2016-2019 **Master's degree in computer science and applied mathematics**, *ENSIMAG*, Grenoble. Double Engineer/Master degree programme.

2013–2016 **Classes préparatoires MP***, *Lycée Carnot*, Dijon.

Post secondary academic course specialised in mathematics and physics.

Internships

March-July 2019 **Intership in shape optimization**, *LAMA/LJK*, Chambéry/Grenoble.

May-July 2018 **Intership in machine learning and image processing**, *GIPSA-Lab*, Grenoble.