

# Eloïse Letournel

*Doctor in mathematics applied to  
quantum physics*

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20/10/1998  
Driving license



## Professional experience

- Jan 2025 - today **Electromagnetic simulation design engineer**, *Nuclétudes (Arianegroup)*, Les Ulis.  
Modelling systems in radiative environment.
- 2021-2024 **PhD in applied mathematics**, *CERMICS, team Matherials*, Champs-sur-Marne.  
Theoretical and numerical analysis of static and dynamical models in electronic structure calculation.  
Under the direction of Antoine Levitt.
- Apr 2021 - Sep 2021 **Master internship**, *CERMICS, team Matherials and CEA Grenoble*, Champs-sur-Marne.  
Computation of quantum resonances in solids and molecules.
- Mar 2020 - Jul 2020 **Research intership**, *mathematics department of the FAU Erlangen*.  
Structural optimization in the context of additive manufacturing.
- Jun 2019 - Aug 2019 **Research and development internship**, *ST Microelectronics*, Agrate (Italy).  
Simulation of phase change non-volatile memories (semiconductors).
- 2018-2019 **Collective Scientific Project (PSC)**, *Ecole polytechnique*, Palaiseau.  
Design and construction of an experimental rocket with stealth plasma. Best PSC Award.  
In charge of the mechanics and contacts of the sponsors within the team of 10.
- 2017 - 2018 **In charge of interventions at the Paris fire Brigade (BSPP)**.  
Human and military formation internship (6 months). About 420 interventions, 1200 hours of work.  
I led teams of two firemen.

## Education

- 2020-2021 **Master 2 in applied mathematics**, *ENSTA and IP Paris*, Palaiseau.  
Master AMS: Analysis, modelling and simulation. Study of PDE and their implementation
- 2017-2021 **Engineering Student at École Polytechnique**, Palaiseau.  
Applied mathematics, Quantum Physics, Algorithmics, Statistical Physics, Fluid Mechanics, Mathematics, Biology, Special Relativity.
- 2015-2017 **Intensive 2-year university level preparation in mathematics and physics**, *Classe préparatoire Blaise Pascal*, Orsay.
- 2014-2015 **Scientific Baccalaureate with Highest Honors**, *Lycée Camille Claudel*, Palaiseau.  
Specializing in Mathematics, with English option.

## Teaching

- 2022 - 2024 **Teaching first year functional analysis (80 hours)**, *ENPC*, Champs-sur-Marne.  
Function spaces, distribution theory, Fourier series and transform, partial differential equations, numerical methods.
- Mar 2023 - Mai 2023 **Supervising a research project for first year students**, *ENPC*, Champs-sur-Marne.  
Quantum resonances in a periodic environment with a defect (group of 4 students).
- 2018 - 2019 **Oral examinations in Mathematics**, *Classe préparatoire Blaise Pascal*, Orsay.  
Advanced post Baccalaureate courses in Mathematics (France).

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## Publications

- 2024 **Linear response and resonances in adiabatic time-dependent density functional theory**, M-S. Dupuy, E. Letournel, A. Levitt.  
preprint: arXiv:2408.00009
- 2023 **Analysis of density matrix embedding theory around the non-interacting limit**, E. Cancès, F. Faulstich, A. Kirsch, E. Letournel, A. Levitt.  
Communications on Pure and Applied Mathematics, Feb. 2025.
- 2022 **Efficient extraction of resonant states in systems with defects**, I. Duchemin, L. Genovese, E. Letournel, A. Levitt, S. Ruget.  
Journal of Computational Physics, Volume 477, article id. 111928.

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## International conferences

- Aug 2023 **ICIAM**, Extraction of resonant states in systems with defects (Tokyo).
- Feb 2023 **SIAM**, Numerical Analysis of Linear Response in Time-Dependent Mean-Field Models of Quantum Mechanics (Amsterdam).
- Mar 2022 - **IPAM**, Advancing Quantum Mechanics with Mathematics and Statistics (workshops I-III),  
Apr 2022 (Los Angeles).

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## Languages

French Native language.  
English Fluent. (TOEFL score: 114)  
Italian Fluent.  
German Basic level of German.

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## Computer skills

Languages Python, Julia  
C, Java, C++  
Matlab

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## Personal interests

Hobbies Painting, running, debating club, guitar playing.  
Volunteering I am engaged in an association which takes disabled children to running events.