



Laurent Vidal

28 years old

75020 Paris

06.61.89.86.62

Laurent.vidal@enpc.fr

github: LaurentVidal95

Driver's license holder

Third year PhD student at | CERMICS, École Nationale des Ponts et Chaussées,
| MATHERIALS team, Inria Paris.

DESIRED POSITION

Research engineer

I am looking for interdisciplinary work to explore new fields of knowledge and for the communication skills that such work implies. I am interested in the development of digital tools for research or industry.

The main topics covered in my PhD include: electronic structure models in quantum chemistry and condensed matter physics, two-dimensional materials and Moiré (twisted bi-layer graphene), numerical analysis, and Riemannian optimisation.

SCIENTIFIC EDUCATION

- 2021 – 2024: PhD in Applied Mathematics**
Reduction methods for physics and quantum chemistry models – supervised by Éric Cancès and Antoine Levitt.
CERMICS, ENPC and MATHERIALS team, Inria Paris.
- 2020 – 2021: Pre-Doctorate**
supervised by Éric Cancès.
CERMICS, ENPC and MATHERIALS team, Inria Paris.
- 2019 – 2020: Master of Applied Mathematics**
Energy and Materials for the Future – numerical analysis, study of PDEs, spectral theory, numerical statistical physics.
Sorbonne Université (formerly Paris VI)
- 2014 – 2019: General Mathematical Studies**
Sorbonne Université (formerly Paris VI)

RESEARCH

Published papers

- Éric Cancès, Geneviève Dusson, Gaspard Kemlin & Laurent Vidal. “On basis set optimisation in quantum chemistry”. In: *ESAIM: Proceedings and Surveys* 73 (2023), pp. 107– 129.
- Éric Cancès, Muhammad Hassan, & Laurent Vidal. “Modified-operator method for the calculation of band diagrams of crystalline materials”. In: *Mathematics of Computation* (2023).

Preprints

- Laurent Vidal, Tommaso Nottoli, Filippo Lipparini, & Éric Cancès. “Geometric optimization of Restricted-Open and Complete Active Space Self-Consistent Field wavefunctions”. *Submitted*.
- Robert Benda, Eric Cancès, Emmanuel Giner & Laurent Vidal. “Self-Consistent Field algorithms in Restricted Open-Shell Hatree-Fock”. *Submitted*.

TEACHING

- 2021 – 2023: Supervision of a group project**
Modelization and computation of the electronic structure of crystalline materials – project for first year students (equivalent to third year at university).
 École Nationale des Ponts et Chaussées
- Sep 2022: “Mathématiques en action”**
 Introductory lesson to the numerical integration and solutions for solving ODEs.
 École Nationale des Ponts et Chaussées
- Sep 2022: “Outils Mathématiques Pour l’Ingénieur” (OMPI)**
 Introductory lesson to completeness, Banach spaces, linear operators and the solving of ODEs.
 École Nationale des Ponts et Chaussées

COMPUTER SKILLS

- Programming language:** Julia, Python, C++, Fortran90.
Code for quantum simulation: DFTK, PySCF, Psi4, GAMESS, Quantum Package 2 Quantum Espresso.

LANGUES

- French** – Native **English** – Fluent
German – Conversational (not recently spoken) **Italian** – Beginner.

The next page contains **two appendices**: one detailing my scientific activities outside the laboratory during my PhD, and the other detailing my work as a **pianist accompanist**.

CONFÉRENCES, WORKSHOPS, SCHOOLS

Talks

- Feb – Mar 2023:** **SIAM CSE 23**
Mini-symposium: *Recent Advances in Numerical Methods for Electronic Structure Calculations*. “Modified-Operator Method for the Calculation of Band Diagrams of Crystalline Materials”
- August 2022:** **GAMM 92nd annual meeting**
Session 26: *Modelling, analysis and simulation of molecular systems*. “On the approximation of energy bands in the Brillouin zone”.
- June 2021:** **EMC2 meeting**
Meeting of the *Extreme-scale Mathematically-based Computational Chemistry* ERC Synergy grant. “Methods for computing Restricted Open-Shell Hartree Fock (ROHF) ground states”.

Workshops and schools

- August 2022:** **DFTK (Density Functional Theory Kernel) school**
Numerical methods for density-functional theory simulations.
- Jun – Jul 2022:** **ISTPC 2022**
International summer School in electronic structure Theory: electron correlation in Physics and Chemistry.
- June 2022:** **GDR NBODY 4th mini-school**
Mathematics for theoretical chemistry and physics.
- Jul – Aug 2021:** **CEMRACS**
Data Assimilation and Reduced Modeling for High Dimensional Problems.

MUSICAL ACTIVITIES

In parallel with my scientific life, I have been active as a pianist, particularly as an accompanist. Here is a short highlight of my activities.

Music and theater

- Sep 2023 – June 2024 :** “**Tout est Rien**”, **Jérémy Sulzer & Laurent Vidal**
Pianist and comedian. Weekly performances.
Théâtre “Les Rendez-Vous d’Ailleurs” then “La Comédie Saint-Michel” Paris
- Oct – Dec 2022 :** “**La Leçon**”, **Eugène Ionesco**
Pianist and role of *La bonne*
Théâtre “Les Rendez-Vous d’Ailleurs”, Paris
- Apr 2020 – May 2022 :** “**Mon neveu Gustave**”
Pianist and role of *Roger*. Play freely adapted from Offenbach’s “Pomme d’Api”
Théâtre “Les Rendez-Vous d’Ailleurs”, Paris
Festival Komidi 2022, Île de La Réunion

Music

- Jul 2021 :** **Rehersals for the opera « L’elisir d’amore »**
Collectif *Cosa Sento* – pianist accompanist.
Paris
- Oct - Nov 2019 :** **Rehersals for the opera « Le nozze di Figaro »**
Collectif *Cosa Sento* – pianist accompanist
Paris
- Sep 2017 - Sep 2019 :** **Concerts with the « Ensemble Tamaris 21 »**
Various interventions in the concert series *Les salons de Varennes*
organized by the musical duo “Ensemble Tamaris 21”
Thury, Bourgogne, France

Other on-going activities

- Sep 2021 – :** **COGE symphonic choir rehearsals**
Accompanist for the *Choeur des Grandes Écoles* choir rehearsals
Issy-les-Moulineaux
- Mar 2019 – :** **Pianist Accompanist**
Various individual lyrical singing lessons, choir rehearsals...