



## Laurent Vidal

29 years old

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Driver's license holder

## CURRENT POSITION

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I am a **postdoctoral researcher** in Applied Mathematics at DAVID lab, Université Versailles Saint-Quentin (UVSQ). I'm currently working on generative models for inverse material design with Jérémie Cabessa, Thibault Charpentier, Marie-Pierre Gaigeot, Mihai-Cosmin Marinica.

## SCIENTIFIC EDUCATION

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- 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

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### Published papers

- Éric Cancès, Geneviève Dussan, 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).
- Laurent Vidal, Tommaso Nottoli, Filippo Lipparini, & Éric Cancès. “Geometric optimization of Restricted-Open and Complete Active Space Self-Consistent Field wavefunctions”. In: *The Journal of Physical Chemistry A* (2024).

## Preprints

- 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.

**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

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### 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

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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 adaptated 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...