# VIVIANA GRASSELLI

3 rue Augustin Fresnel 57000 Metz Technopôle ⋄ viviana.grasselli@univ-lorraine.fr

## RESEARCH EXPERIENCE

**Maître de conférences (associate professor)** *2024 - present*
*Institut Elie Cartan de Lorraine, Metz, France*

Member of the Partial Differential Equations research team

**Postdoctoral researcher** *2023 - 2024*
*Institut Elie Cartan de Lorraine, Metz, France*

Member of the ANR-DFG French German project "Effective Approximation and Dynamics of Many-Body Quantum Systems "
Advisors: Sébastien Breteaux and Jérémy Faupin

**Ph.D. program under the supervision of Prof. Jean-Marc Bouclet** *2020 - 2023*
*Institut de Mathématiques de Toulouse, France*

Subject : "Study of the resolvent of the perturbed Schrödinger operator "

## EDUCATION AND DEGREES

**PhD in Mathematics** *2023*
*Université Paul Sabatier, Toulouse, France*

**Master's degree in Mathematics** *2020*
*Università di Pisa, Italy*

Final degree mark: 110/110 (with honours)

**Bachelor's degree in Mathematics** *2017*
*Università degli Studi di Perugia, Italy*

Final degree mark: 110/110 (with honours)

## RESEARCH INTERESTS

My research lies in the field of mathematical physics and in particular **quantum dynamics**. On one hand I have been studying **spectral properties** for perturbed Hamiltonians of systems in various manifolds settings. This spectral analysis is tightly linked to the dynamical behaviour of the systems. Recently I have also been interested in Hamiltonians for systems with **many particles**. My main focus is to study the rigorous link between properties of the many body evolution and properties of the effective model.

## PREPRINTS AND PUBLICATIONS

**On the number of bound states for fractional Schrödinger operators with critical and super-critical exponent** *2025*
*with S. Breteaux and J. Faupin, Journal of Spectral Theory 15 (2025), no. 2, pp. 611–645*

**On the definition of zero resonances for the Schrödinger operator with optimal scaling potentials** *2025*
*Osaka Journal of Mathematics 62(1): 123-144 (January 2025)*

**Dispersive equations on asymptotically conical manifolds: time decay in the low frequency regime** *2023*
*Annals of Global Analysis and Geometry 2023, 63, 17*

## INVITED TALKS

- **INVITED SPEAKER IN CONFERENCES**

**Conference "Emergent phenomena in many-body quantum systems "** *12/2025*
*CIRM, Marseille, France*

**Thematic days "Quantum Lo"** *03/2025*
*Institut Elie Cartan de Lorraine, Nancy, France*

**Mini workshop Effective Approximation and Dynamics of Many-Body Quantum Systems** *03/2025*
*IRMAR, Rennes, France*

**Journées Jeunes EDPistes en France** *03/2024*
*Institut de Mathématiques de Toulouse, France*

**Kick-off Meeting of the ANR-DFG project Effective Approximation and Dynamics of Many-Body Quantum Systems** *08/2023*
*Institut Elie Cartan de Lorraine, Metz, France*

- **INVITED SPEAKER IN SEMINARS**

**Statistical Mechanics Seminar** *06/2025*
*Warwick Mathematics Institute, Coventry, England*

**Meeting of the Analysis and Number Theory team** *06/2024*
*Institut Elie Cartan de Lorraine, Metz, France*

**Mathematical Physics seminar** *04/2024*
*Institut Camille Jordan, Lyon, France*

**Partial Differential Equations seminar** *02/2024*
*IRMAR, Rennes, France*

**Quantum and Classical Dynamics seminar** *01/2024*
*Centre de Physique Théorique, Marseille, France*

**Partial Differential Equations and Mathematical Physics seminar** *01/2024*
*LAGA, Université Sorbonne Paris Nord, Paris, France*

**Partial Differential Equations Analysis and Applications seminar** *06/2023*
*Institut Elie Cartan de Lorraine, Metz, France*

**Differential Equations seminar** *05/2023*
*Graduate School of Science Osaka University, Osaka, Japan*

**Spectral problems in Mathematical Physics seminar** *12/2022*
*Institut Henri Poincaré, Paris, France*

**Students seminar in Partial Differential Equations** *06/2022*
*Institut de Mathématiques de Toulouse, France*

**Analysis seminar** *05/2022*
*Institut de Mathématiques de Toulouse, France*

## POSTER SESSIONS

**DynQua Conference** *02/2025*
*LAREMA, Université d'Angers, France*

**Summer school "Rigorous Renormalization Group Analysis of Collective Phenomena in Fermionic Quantum Systems"** *08/2024*
*Lake Como School of Advanced Studies, Italy*

**Summer school "Effective Approximation and Dynamics of Many-Body Quantum Systems"** *06/2024*
*Institut Elie Cartan de Lorraine, Metz, France*

## RESEARCH STAYS

**Invited one month from Prof. I. M. Sigal** *07/2025*
*Department of Mathematics, University of Toronto, Canada*

**Invited two weeks from Prof. H. Mizutani** *05/2023*
*Mathematics Graduate School of Science, Osaka University, Japan*

## TEACHING EXPERIENCE

**Université de Lorraine, Metz France** *2025 - 2026*

- Analysis 3: exercises sessions. Bachelor's degree in Mathematics (*54h*)
- Analysis 4: exercises sessions. Bachelor's degree in Mathematics (*28h*)

- Numerical analysis: computer sessions. Bachelor's degree in Mathematics (*10h*)
- Optimisation: course, exercises and computer sessions. Master's degree in Mathematics (*36h*)
- Linear algebra and foundations of mathematics: course. Bachelor's degree in Computer Science (*70h*)

**Université de Lorraine, Metz France** *2024 - 2025*

- Analysis 3: exercises sessions. Bachelor's degree in Mathematics (*20h*)
- Analysis 4: exercises sessions. Bachelor's degree in Mathematics (*25h*)
- Numerical analysis: computer sessions. Bachelor's degree in Mathematics (*10h*)
- Linear algebra and foundations of mathematics: course. Bachelor's degree in Computer Science (*105h*)

**Université de Lorraine, Metz France** *2023 - 2024*

- Mathematical tools: course. Bachelor's degree in Computer Science (*30h*)

**Université Paul Sabatier, Toulouse, France** *2022 - 2023*

- Tutoring for Mathematics: exercises sessions. Bachelor's degree in Fundamental Sciences (*60h*)
- Linear Algebra: computer sessions. Bachelor's degree in Fundamental Sciences (*4h*)

**Université Paul Sabatier, Toulouse, France** *2021 - 2022*

- Tutoring for Mathematics: exercises sessions. Bachelor's degree in Fundamental Sciences (*30h*)
- Linear algebra: course. Bachelor's degree in Civil and Mechanical Engineering (*30h)*

**Università di Pisa, Italy** *2019 - 2020*

- Mathematics: exercises sessions. Bachelor's degree in Economics (*60h)*

## ORGANIZING RESPONSABILITIES

**Co-organizer of the PDE, Analysis and Applications seminar** *2025 - present*
*Institut Elie Cartan de Lorraine*

**Co-organizer of the PhD student seminar** *2021-2023*
*Institut de Mathématiques de Toulouse*

**Co-manager of the IMT- EUR MINT- Labex CIMI Twitter account** *2021-2023*

## PROGRAMMING SKILLS

**C, Python, Matlab, Latex**

## SKILLS

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| **Language** | Italian (Native speaker), English (fluent), French (fluent) | |
| **Certifications** | IELTS certificate, Overall Band Score: 8, CEFR Level: C1 | *2020* |