

VIVIANA GRASSELLI

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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)

TEACHING EXPERIENCE

Université de Lorraine, Metz France 2024 - 2025

- Linear algebra and foundations of mathematics course for the Bachelor’s degree in Computer Science (105h)
- Analysis 4 exercises sessions for the the Bachelor’s degree in Mathematics (25h)
- Analysis 3 exercises sessions for the the Bachelor’s degree in Mathematics (20h)
- Numerical analysis exercises sessions for the the Bachelor’s degree in Mathematics (10h)

Université de Lorraine, Metz France 2023 - 2024

- Mathematical tools course for the Bachelor's degree in Computer Science (30h)

Université Paul Sabatier, Toulouse, France

2022 - 2023

- Tutoring for Mathematics course of Bachelor's degree in Fundamental Sciences (60h)
- Numerical practice sessions for Linear Algebra course of Bachelor's degree in Fundamental Sciences (4h)

Université Paul Sabatier, Toulouse, France

2021 - 2022

- Tutoring for Mathematics course of Bachelor's degree in Fundamental Sciences (30h)
- Linear algebra course for the Bachelor's degree in Civil and Mechanical Engineering (30h)

Università di Pisa, Italy

2019 - 2020

- Tutoring for Mathematics course of the Bachelor's degree in Economics (60h)

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

Journées thématiques "Quantum Lo"

03/2025

Institut Elie Cartan de Lorraine, Nancy, France

Mini workshop Effective Approximation and Dynamics of Many-Body Quantum Systems <i>IRMAR, Rennes, France</i>	<i>03/2025</i>
Journée de l'équipe Analyse et Théorie des nombres <i>Institut Elie Cartan de Lorraine, Metz, France</i>	<i>06/2024</i>
Séminaire de Physique Mathématiques <i>Institut Camille Jordan, Lyon, France</i>	<i>04/2024</i>
Journées Jeunes EDPistes en France <i>Institut de Mathématiques de Toulouse, France</i>	<i>03/2024</i>
Séminaire Équations aux dérivées partielles <i>IRMAR, Rennes, France</i>	<i>02/2024</i>
Séminaire Dynamique Quantique et Classique <i>Centre de Physique Théorique, Marseille, France</i>	<i>01/2024</i>
Séminaire EDP et Physique mathématique <i>LAGA, Université Sorbonne Paris Nord, Paris, France</i>	<i>01/2024</i>
Kick-off Meeting of the ANR-DFG project Effective Approximation and Dynamics of Many-Body Quantum Systems <i>Institut Elie Cartan de Lorraine, Metz, France</i>	<i>08/2023</i>
Séminaire EDP, Analyse et Applications <i>Institut Elie Cartan de Lorraine, Metz, France</i>	<i>06/2023</i>
Differential Equation Seminar <i>Department of Mathematics Graduate School of Science Osaka University, Osaka, Japan</i>	<i>05/2023</i>
Séminaire Problèmes Spectraux en Physique Mathématique <i>Institut Henri Poincaré, Paris, France</i>	<i>12/2022</i>
IMT PDEs students seminar <i>Institut de Mathématiques de Toulouse, France</i>	<i>06/2022</i>
IMT Analysis seminar <i>Institut de Mathématiques de Toulouse, France</i>	<i>05/2022</i>

POSTER SESSIONS

Summer school "Rigorous Renormalization Group Analysis of Collective Phenomena in Fermionic Quantum Systems" <i>Lake Como School of Advanced Studies, Italy</i>	<i>08/2024</i>
Summer school "Effective Approximation and Dynamics of Many-Body Quantum Systems" <i>Institut Elie Cartan de Lorraine, Metz, France</i>	<i>06/2024</i>

ORGANIZING RESPONSABILITIES

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

2021-2023

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

2021-2023

PROGRAMMING SKILLS

C, Python, Matlab, Latex

SKILLS

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

2020