

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)

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

Propagation Estimates for the Boson Star Equation 2025
avec S. Breteaux and J. Faupin, submitted

Exponential Decay outside of the Light Cone for the Pseudo-Relativistic Non-Autonomous Schrödinger Equation 2025
avec S. Breteaux and J. Faupin, submitted

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 “Effective Approximation and Dynamics of Many-Body Quantum Systems” 07/2026
Constructor University, Bremen, Germany

XVIIème Colloque Franco-Roumain de Mathématiques Appliquées 06/2026
Institut Elie Cartan de Lorraine, Nancy, France

Meeting MARGAUx :Numerical Analysis and PDEs 03/2026
Institut de Mathématiques de Bordeaux, France

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**

PDEs and Applications Seminar 03/2026
Institut Elie Cartan de Lorraine, Nancy, France

Mathematical Physics Seminar 01/2026
Politecnico di Milano, Milano, Italy

Analysis and Probability Seminar 01/2026
CEREMADE, Paris, France

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 <i>LAREMA, Université d'Angers, France</i>	<i>02/2025</i>
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>

RESEARCH STAYS

Invited one month from Prof. I. M. Sigal <i>Department of Mathematics, University of Toronto, Canada</i>	<i>07/2025</i>
Invited two weeks from Prof. H. Mizutani <i>Mathematics Graduate School of Science, Osaka University, Japan</i>	<i>05/2023</i>

TEACHING EXPERIENCE

Université de Lorraine, Metz France	<i>2025 - 2026</i>
• Analysis 3: exercises sessions. Bachelor's degree in Mathematics (<i>54h</i>) • Analysis 4: exercises sessions. Bachelor's degree in Mathematics (<i>28h</i>) • Numerical analysis: computer sessions. Bachelor's degree in Mathematics (<i>10h</i>) • Optimisation: course, exercises and computer sessions. Master's degree in Mathematics (<i>36h</i>) • Linear algebra and foundations of mathematics: course. Bachelor's degree in Computer Science (<i>70h</i>)	
Université de Lorraine, Metz France	<i>2024 - 2025</i>
• Analysis 3: exercises sessions. Bachelor's degree in Mathematics (<i>20h</i>) • Analysis 4: exercises sessions. Bachelor's degree in Mathematics (<i>25h</i>) • Numerical analysis: computer sessions. Bachelor's degree in Mathematics (<i>10h</i>) • Linear algebra and foundations of mathematics: course. Bachelor's degree in Computer Science (<i>105h</i>)	
Université de Lorraine, Metz France	<i>2023 - 2024</i>
• Mathematical tools: course. Bachelor's degree in Computer Science (<i>30h</i>)	
Université Paul Sabatier, Toulouse, France	<i>2022 - 2023</i>
• Tutoring for Mathematics: exercises sessions. Bachelor's degree in Fundamental Sciences (<i>60h</i>) • Linear Algebra: computer sessions. Bachelor's degree in Fundamental Sciences (<i>4h</i>)	
Université Paul Sabatier, Toulouse, France	<i>2021 - 2022</i>
• Tutoring for Mathematics: exercises sessions. Bachelor's degree in Fundamental Sciences (<i>30h</i>)	

- 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

Language Italian (Native speaker), English (fluent), French (fluent)

Certifications IELTS certificate, Overall Band Score: 8, CEFR Level: C1

2020