

Victor Vilaça Da Rocha

Visiting Assistant Professor

Georgia Tech
School of Mathematics
Bureau Skiles 022
686 Cherry St NW
30313 Atlanta, Georgia (US)
✉ vrocha3@gatech.edu
Date of birth: 01/18/1988
Citizenship : French

Current Situation

2019–... **HALE Visiting Assistant Professor**, *Georgia Institute of Technology*, Atlanta, *US*.
With Pr. Rafael de la Llave.

Education

- Fall 2018 **Post-doc Fellow**, *MSRI - Mathematical Sciences Research Institute*, Berkeley, *US*.
Semester: "Hamiltonian systems, from topology to applications through analysis".
- 2017–2019 **Post-doc Fellow**, *BCAM - Basque Center of Applied Mathematics*, Bilbao, *Spain*.
With Pr. Luis Vega.
- 2014–2017 **PhD Student in Mathematics**, *LMJL, Université de Nantes*, Nantes, *France*.
Dissertation Topic: “*Emphasising nonlinear behaviors for cubic coupled Schrödinger systems*”,
supervised by Pr. Benoît Grébert and Pr. Laurent Thomann, defended on the 27th June, 2017.
Members of the Jury:
- Valeria Banica (referee), Université d’Évry Val d’Essonne,
- Jean-Marc Delort (president of the jury), Université Paris 13,
- Benoît Grébert (advisor), Université de Nantes,
- Gueorgui Popov (examiner), Université de Nantes,
- Laurent Thomann (advisor), Université de Lorraine,
- Nikolay Tzvetkov (examiner), Université de Cergy-Pontoise,
- Nicola Visciglia (referee), Università di Pisa.
Thesis available on <https://tel.archives-ouvertes.fr/tel-01562293v2>
- 2013–2014 **Master 2 Research on Fundamental and Applied Mathematics**, *Université de Nantes*, Nantes, Rank: 2/11.
- 2013 **Competitive examination**, *Public Education System*, France.
Agrégation de Mathématiques.
- 2012–2013 **Master 2 Preparation for the civil service competitive examinations for higher education teaching**, *Université de Nantes*, Nantes.
- 2011–2012 **Master 1 Fundamental and Applied Mathematics**, *Université de Nantes*.
- 2010–2011 **Bachelor in Mathematics**, *Université de Nantes*, Nantes.

Key words

- **Hamiltonian partial differential equations: Nonlinear Schrödinger systems – Long time behaviors – Normal forms – KAM theory.**
- **Nonlinear behaviors: Energy exchanges – Modified scattering and wave operators – Linear stability and instability.**
- **Binormal flow equation: Selfsimilar solutions – Turbulence – Intermittency – Riemann’s non-differentiable function.**

Publications

Published work

- 2019 **Riemann's non-differentiable function is intermittent**, *A. Boritchev, D. Eceizabarrena, V. Vilaça Da Rocha*.
Submitted. Available on arxiv:1910.13191
- 2018 **Stable and unstable small amplitude solutions for a system of coupled NLS equations**, *B. Grébert, V. Vilaça Da Rocha*.
Nonlinearity, 31(10), 4776. Available on arXiv:1710.09173
- 2017 **Modified scattering and beating effect for coupled Schrödinger systems on product spaces with small initial data**, *V. Vilaça Da Rocha*.
Transactions of the AMS, 371 (2019), no. 7, 4743–4768. Available on arXiv:1609.03848
- 2016 **Asymptotic behavior of solutions to the cubic coupled Schrödinger systems in one space dimension**, *V. Vilaça Da Rocha*.
Dynamics of Partial Differential Equations, 13(1), 1219-1274. Available on arXiv:1511.01263

Seminar proceeding

- 2017 **Emphasizing nonlinear behaviors for cubic coupled Schrödinger systems**, *V. Vilaça Da Rocha*.
Journées Équations aux dérivées partielles, Cedram.

Work in progress

- 2020 **Generalized Intermittency for a class of Riemann's non-differentiable functions**, *D. Eceizabarrena, V. Vilaça Da Rocha*.
- 2020 **A KAM result for beating solutions of cubic Schrödinger systems on the torus**, *E. Haus, V. Vilaça Da Rocha*.

Conferences, Seminar, Workshops

Talks in national or international conferences

- June 2020 **Recent progress in nonlinear dispersive PDE, 13th AIMS Conference on Dynamical Systems, Differential Equations and Applications**, *Atlanta, US*.
- June 2020 **Recent trends in mathematical fluid mechanics, 13th AIMS Conference on Dynamical Systems, Differential Equations and Applications**, *Atlanta, US*.
- October 2019 **Midwest Dynamical Systems 2019**, *Chicago, US*, (poster presentation).
- June 2019 **Hamiltonian PDEs: KAM, Reducibility, Normal Forms and Applications**, *Oaxaca, Mexico*.
- Nov. 2018 **Post-doc Workshop**, *MSRI, Berkeley, US*.
- June 2018 **Jeunes Chercheurs en Analyse des Équ. Dispersives**, *Villetaneuse, France*.
- March 2018 **Journées Jeunes EDPistes**, *Nancy, France*.
- June 2017 **Journées EDP 2017**, *Roscoff, France*.
- October 2016 **Rencontres Doctorales Lebesgue**, *Angers, France*.
- ### Talks in seminars or working groups
- March 2020 **PDE Seminar**, *Georgia Tech, US*.
- Nov. 2019 **Dynamical systems - Working group**, *Georgia Tech, US*.
- Sept. 2019 **Dynamical Systems Seminar**, *Georgia Tech, US*.
- July 2019 **Haminstab Seminar**, *UPC Barcelona*.

- Nov. 2018 **Hamiltonian Seminar**, *MSRI, Berkeley, US.*
- October 2018 **Analysis and PDE Seminar**, *UC Berkeley, US.*
- January 2018 **Physic-Mathematics and PDE Seminar**, *Université de Bordeaux, France.*
- Nov. 2017 **Working seminar on PDEs**, *Institut BCAM de Bilbao, Spain.*
- Nov. 2017 **PDE Seminar**, *Université d'Orsay, France.*
- October 2017 **Working seminar on PDEs**, *Institut BCAM de Bilbao, Spain.*
- March 2017 **PDE Seminar**, *Université de Nantes, France.*
- Feb. 2017 **Young mathematicians seminar**, *Université de Nantes, France.*
- January 2017 **PDE Seminar**, *Cergy-Pontoise, France.*
- Dec. 2016 **PDE Seminar**, *Besançon, France.*
- Nov. 2016 **Young mathematicians seminar**, *Université de Rennes, France.*
- July 2016 **Journée de sortie du LMJL**, *Nantes, France.*
- January 2016 **Young mathematicians seminar**, *Université de Nantes, France.*
- Feb. 2015 **Young mathematicians seminar**, *Université de Nantes, France.*

Attended

- March 2019 **Les 60 ans de Jean-Yves Chemin**, *Paris, France.*
- March 2019 **Journées Jeunes EDPistes français**, *Rennes, France.*
- February 2019 **Tenth Itinerant Meeting in PDE's**, *Rome, Italie.*
- Nov. 2018 **Hamiltonian systems, from topology to applications through analysis II**, *MSRI, Berkeley, US.*
- October 2018 **Hamiltonian systems, from topology to applications through analysis I**, *MSRI, Berkeley, US.*
- August 2018 **Introductory Workshop: Hamiltonian systems, from topology to applications through analysis**, *MSRI, Berkeley, US.*
- August 2018 **Connections for Women: Hamiltonian Systems, from topology to applications through analysis**, *MSRI, Berkeley, US.*
- June 2018 **An Analyst, a Geometer and a Probabilist Walk Into a Bar**, *Cardiff, UK.*
- June 2018 **Journées EDP 2018**, *Obernai, France.*
- May 2018 **BeKAM International Meeting 2018**, *Cargese, France.*
- March 2018 **Meeting "Contrôle et Dynamique des EDP"**, *Nancy, France.*
- January 2018 **Ninth Itinerant Workshop in PDE's**, *Bordeaux, France.*
- July 2017 **Analyse asymptotique des équations d'évolution**, *CIRM, Marseille, France.*
- March 2017 **Journées Jeunes EDPistes français**, *Autrans, France.*
- March 2017 **Première rencontre ANR ISDEEC**, *IHES, Bures-sur-Yvette, France.*
- Sept. 2016 **Hamiltonian Dynamics, PDEs and Waves on the Amalfi coast**, *Maiori, Italy.*
- June 2016 **Journées EDP 2016**, *Roscoff, France.*
- May 2016 **Nonlinear Waves 2016: May Conference**, *IHES, Bures-sur-Yvette, France.*
- May 2016 **First meeting of the ANR project BEKAM**, *Nantes, France.*
- March 2016 **Journées Jeunes EDPistes français**, *Bordeaux, France.*
- January 2016 **Journée Nantes-Rennes d'Analyse 2016**, *Nantes, France.*

- January 2016 **Seventh Itinerant Workshop in PDE's**, Nice, France.
- Sept. 2015 **Shocks, Singularities and Oscillations in Nonlinear Optics and Fluid Mechanics**, Roma, Italy.
- August 2015 **Summer school on current topics in mathematical physics**, Valparaiso, Chile.
- June 2015 **Normal Forms and Large Time Behavior for Nonlinear PDE**, Nantes, France.
- May 2015 **Journées EDP 2015**, Roscoff, France.
- March 2015 **Journées Jeunes EDPistes français**, Saint-Brévin, France.
- March 2015 **Long time dynamics and regularity for hydrodynamical systems**, Nantes.
- Nov. 2014 **Final meeting of the ANR project DynPDE**, Cargese, France.
- October 2014 **Rencontres Doctorales Lebesgue**, Rennes, France.
- Sept. 2014 **KAM theory and dispersive PDE's**, Roma, Italy.

Related research activities

Reviews for *AMS reviews*, *Revista Matemática Iberoamericana*, *Discrete and Continuous Dynamical Systems*, *Funkcialaj Ekvacioj* and *Physica Scripta*.

Invitations, Scientific Stays

- July 2019 **UPC Barcelona**, Barcelona, Spain.
ERC Haminstab from Marcel Guardia.
- Fall 2018 **MSRI**, Berkeley, Postdoc Fellow.
MSRI semester: Hamiltonian systems, from topology to applications through analysis.

Professional experiences

Master theses

- 2014 **Master's thesis**, *Université de Nantes*, Nantes.
Topic: "Emphasizing energy exchanges between different modes in a Hamiltonian system" supervised by Benoît Grébert and Laurent Thomann.
- 2012 **Master 1 thesis**, *Université de Nantes*, Nantes.
Topic: "Study of singular values," supervised by Luc Hillairet.

Teaching Experience

- 2019–... **Visiting Assistant Professor**, *Georgia Tech*, Atlanta.
- Math Methods of Applied Sciences II (Linear Algebra, Differential Equations and Complex Analysis)
- Differential Equations,
- Linear Algebra.
- 2014–2017 **Teacher Assistant**, *Université de Nantes*, Nantes.
- Calculus I,
- Calculus III for Computer Science,
- Discrete Probabilities,
- A Second Course on Linear Algebra,
- Linear Algebra.

Conference organization

- June 2020 **Summer School and Workshop in Fluids and Waves**, *GaTech, Atlanta, US*.
Nov. 2018 **Post-doc Workshop**, *MSRI, Berkeley, US*.
July 2017 **Journée de sortie du Laboratoire de Mathématiques Jean Leray**, *Nantes*.
October 2015 **Rencontres Doctorales Lebesgue**, *Nantes, France*.

Other professional experiences

- 2015-2017 **Representative of the PhD students in the Department's council of the Laboratoire de Mathématiques Jean Leray**, *Université de Nantes, Nantes*.
April 2016 **JDOC**, *Nantes*.
1st prize for my talk in the JDOC, a workshop for all PhD students in Sciences from Universities and Engineering Schools from Angers and Nantes.
May 2015 **Participation in the “Semaine d’Études Mathématiques et Entreprises” (SEME)**, *Université de Nantes, Nantes*.
2014–2015 **Workshop “Maths-Theater”**, *Primary school Longchamp, Nantes*.