

# Roulley Emeric

Post-doc researcher

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Birth 13/06/1994

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## Academic background

- 2022- **Postdoc**, *SISSA, Trieste*  
Scientific referent : Massimiliano Berti
- 2019-2022 **PhD**, *IRMAR, Rennes*  
Advisor : Taoufik Hmidi
- 2019 **Internship**, *IRMAR, Rennes*  
KAM theory for PDE supervised by Taoufik Hmidi
- 2018 **Agrégation de mathématiques**
- 2017 **Internship**, *Laboratoire Jean Leray, Nantes*  
Dyadic harmonic analysis supervised by Frédéric Bernicot and Cristina Benea
- 2016 **Internship**, *Laboratoire Nicolas Oresme, Caen*  
Banach-Stone theorem and compact group supervised by Eric Ricard and Roland Vergnioux
- 2015-2019 **ENS Rennes and University Rennes 1**  
Bachelor and Master degrees
- 2012-2015 **Prépa MPSI, MP\* (5/2)**, *Lycée Malherbe, Caen*

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## Publications and Preprints

ORCID **0000-0002-1593-3781**

- [1] **Time quasi-periodic vortex patches for quasi-geostrophic shallow-water equations**  
with Taoufik Hmidi, to appear in *Mémoires de la Société Mathématique de France*
- [2] **Vortex rigid motion in quasi-geostrophic shallow-water equations**  
*Asymptotic Analysis* 133 (2022), no. 3, 397–446.
- [3] **Boundary effects on the emergence of quasi-periodic solutions for Euler equations**  
with Zineb Hassainia
- [4] **Periodic and quasi-periodic Euler- $\alpha$  flows close to Rankine vortices**  
*Dynamics of Partial Differential Equations* 20 (2023), no. 4, 311-366.
- [5] **Invariant KAM tori around annular vortex patches for 2D Euler equations**  
with Zineb Hassainia and Taoufik Hmidi
- [6] **Dynamics of vortex cap solutions on the rotating unit sphere**  
with Claudia García and Zineb Hassainia
- [7] **Local and global bifurcation of electron-states**
- [8] **Uniformly rotating vortices for the lake equation**  
with Taoufik Hmidi, Haroune Houamed and Mohamed Zerguine

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## Conferences

- Jan. 2024 **Long time behaviour and singularity formation in PDE-Part VI**, *Online*
- Aug. 2023 **School/Workshop on Wave Dynamics: Turbulent vs Integrable Effects**, *Trieste (ICTP)*
- June 2023 **New trends in mathematical fluid dynamics**, *Grenoble (Institut Fourier)*
- May 2023 **Hamiltonian and dispersive PDEs, second school and workshop**, *Roma*
- Oct. 2022 **Young Researcher's Workshop on Nonlocal PDEs and Applications**, *Granada*

- Sept. 2022 **Hamiltonian and dispersive PDEs, first school and workshop**, *Pisa*
- June 2022 **Summer school on fluids and turbulence**, *Lyon (Institut Camille Jordan)*
- May 2022 **Long time behaviour and singularity formation in PDE-Part V**, *Online*
- April 2022 **Research school Mathematical advances in geophysical flows**, *CIRM*
- Jan. 2022 **Long time behaviour and singularity formation in PDE-Part IV**, *Online*
- May 2021 **Long time behaviour and singularity formation in PDE-Part III**, *Online*
- Jan. 2021 **Long time behaviour and singularity formation in PDE-Part II**, *Online*
- May 2020 **Long time behaviour and singularity formation in PDE-Part I**, *Online*

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## Talks

- Dec. 2023 **PDE seminar**, *Laboratoire Jean Leray Nantes*  
Poches périodiques et quasi-périodiques en temps
- Nov. 2023 **PDE seminar**, *New York University Abu Dhabi*  
Dynamics of vortex cap solutions on the rotating unit sphere
- June 2023 **Analysis Junior Seminar**, *SISSA*  
Dynamics of vortex cap solutions on the rotating unit sphere
- Feb. 2023 **Analysis Junior Seminar**, *SISSA*  
Invariant KAM tori around annular vortex patches for 2D Euler equations
- Dec. 2022 **Junior Math Days**, *SISSA*  
Periodic and quasi-periodic vortex patch motion
- May 2022 **PDE seminar**, *Universitat Autònoma de Barcelona*  
Boundary effects on the emergence of quasi-periodic solutions for Euler equations
- May 2022 **Analysis seminar**, *Online SISSA*  
Time quasi-periodic vortex patch solutions for geophysical fluid models
- April 2022 **Brittany PhD meeting**, *University Rennes 1*  
Hurricanes and implicit function theorem
- Dec. 2021 **PDE seminar**, *New York University Abu Dhabi*  
Boundary effects on the emergence of quasi-periodic solutions for Euler equations
- June 2021 **PDE seminar**, *University Rennes 1*  
Time quasi-periodic vortex patches for quasi-geostrophic shallow-water equations
- Jan. 2021 **PDE PhD seminar**, *University Rennes 1*  
Doubly-connected V-states for quasi-geostrophic shallow-water equations
- Jan. 2020 **PDE PhD seminar**, *University Rennes 1*  
Time (quasi-)periodic solutions for quasi-geostrophic shallow-water equations
- Aug. 2019 **Workshop harmonic analysis**, *Saint-Nazaire*  
Quasi-periodic solutions in PDE

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## Administrative duties

- Reviewer for Annales Polonici Mathematici**
- Reviewer for Transactions of the American Mathematical Society**
- Reviewer for Journal of Mathematical Analysis and Applications**
- 2020-2022 **Co-organizer of PDE PhD seminar University Rennes 1**
- Oct. 2020 **Participation to "fête de la science"**, *Rennes*  
Presentation of mathematical objects/concepts to the general public

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## Teaching

- Sept.-Oct. 2022 **Lectures on periodic and quasi-periodic vortex patches**, *SISSA*  
Around 15h for the Analysis seminar/working group

- 2020-2022 **Integral calculus for Agrégation de mathématiques**, *University Rennes 1*
- 2019-2022 **Tutorials for undergraduate classes**, *University Rennes 1*
- 2018-2019 **Colles in prépa MP**, *Lycée Chateaubriand Rennes*  
Weakly oral examinations for undergraduate students
- 2012-2022 **Private lessons in Mathematics**  
Every level until Bachelor degree

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## Languages

- French **Mother language**
- English **TOEIC level**
- Spanish **Basics**
- Italian **Basics**