

# Zoïs Moitier

*Postdoctoral researcher*

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## Professional Experiences

2019 – **Postdoctoral researcher**, in *University of California Merced (USA)*, under the supervision of Camille Carvalho.

## Education

- 2016 – 2019 **PhD thesis in Mathematics**, at *University of Rennes 1 (IRMAR, numerical analysis team)*, under the supervision of Stéphane Balac and Monique Dauge, “*Mathematical and numerical study of resonances in optical micro-cavities*”, [[theses.fr](https://theses.fr)].
- 2015 – 2016 **Master’s Degree (Research)**, *University of Rennes 1*, Specialization: Partial Differential Equations and Numerical Analysis, *Summa cum laude*.
- 2014 – 2015 **Agrégation of Mathematics**, Scientific Computing option, Successful candidate.  
**Master’s Degree (Teaching)**, at *ENS Rennes and University of Rennes 1*, Specialization: Mathematics and Teaching, *Summa cum laude*.
- 2013 – 2014 **National examination for the admission in third year at ENS Rennes**, in mathematics, Successful candidate.
- 2012 – 2013 **Bachelor’s Degree**, at *ENS of Lyon and University of Lyon 1*, in mathematics.
- 2009 – 2012 **Preparatory Classes**, in *Pierre Corneille high school, Rouen*, two-year undergraduate intensive course in mathematics and physics, computer science option.

## Publications

### Pre-publications

- 2020 **Asymptotics for metamaterial cavities and their effect on scattering**, with Camille Carvalho. [[arXiv:2010.07583](https://arxiv.org/abs/2010.07583), [HAL-02965993](https://hal.archives-ouvertes.fr/hal-02965993)]
- Asymptotics for 2D whispering gallery modes in optical micro-disks with radially varying index**, with Stéphane Balac and Monique Dauge. [[arXiv:2003.14315](https://arxiv.org/abs/2003.14315)]

### Publications

- 2020 **Mathematical analysis of whispering gallery modes in graded index optical micro-disk resonators**, with Stéphane Balac, Monique Dauge, Yannick Dumeige, and Patrice Féron. [to appear in *Eur. Phys. J. D*, [HAL-02157635](https://hal.archives-ouvertes.fr/hal-02157635)]

### Proceedings

- 2019 **Asymptotic expansions of Whispering Gallery Modes in graded index optical micro-cavities**, with Stéphane Balac and Monique Dauge, WAVES, Vienna (Austria). [[Link](#)]

## Research Conferences

### As an invited speaker

- 2021 Oct. Talk at the workshop Numerical Waves in Nice (France).

- June Semiclassical analysis meets Numerical Analysis (SCA meets NA), Bath (United Kingdom).
- 2018 Dec. Talk at the PhD seminar of Cergy (France).
- Nov. Talk at the numerical analysis seminar, Bath (United Kingdom).
- Aug. Talk at 14<sup>th</sup> Franco-Romanian conference on applied mathematics in the mini-symposium *Mathematical Physics and related subjects*, Bordeaux (France).
- Mar. Talk at the ICCEM conference (IEEE International Conference on Computational Electromagnetic) in the mini-symposium *Mathematical Aspects of Computational Electromagnetic*, Chengdu (China). [Extended Abstract, [HAL-01715438](#)]
- Mar. Talk at PhD seminar of Nantes (France).
- 2017 Oct. Poster at 6<sup>th</sup> EDP-Normandie conference, Caen (France).
- As a speaker or contributor**
- 2021 Mar. SIAM Conference on Computational Science and Engineering (CSE21), Fort Worth (USA).
- 2019 Nov. Talk at the Waves Seminar, UC Merced (USA).
- Aug. Talk at WAVES, 14<sup>th</sup> International Conference on Mathematical and Numerical Aspects of Wave Propagation, Vienna (Austria).
- Mar. Poster at the young researchers days in PDE, Rennes (France).
- 2018 Jun. Talk at the 2<sup>nd</sup> analysis PhD day of IRMAR, Rennes (France).
- May Talk at the 44<sup>th</sup> CANUM conference, Cap d'Agde (France).
- 2017 Nov. Talk at the analysis PhD seminar of Rennes (France).
- Oct. Talk at the 5<sup>th</sup> Mathematics and Optics Days, Rennes (France).
- Jun. Poster at the 8<sup>th</sup> SMAI conference, La Tremblade (France).
- Mar. Talk at analysis PhD seminar of Rennes (France).
- As a participant**
- 2018 Oct. Lebesgue PhD meeting of the Henri Lebesgue Center, Brest (France).
- Apr. Spring school, *Fundamentals and practice of finite elements*, Thematic Semester "Scientific Computing" of the Henri Lebesgue Center, Roscoff (France).
- 2017 Oct. Lebesgue PhD meeting of the Henri Lebesgue Center, Rennes (France).
- May Hyperbolic Equation and Mathematic Physic, Bordeaux (France).
- May WAVES, 13<sup>th</sup> International Conference on Mathematical and Numerical Aspects of Wave Propagation, Minneapolis (USA).
- Feb. Numeric and mathematical analysis for singularities, Rennes (France).
- 2016 Nov. Waves, boundaries and oscillations in numerical schemes, Rennes (France).
- Oct. Workshop C++: basics of the 11 and 14, Rennes (France).

## Responsibilities

- 2021 Co-organizer of the minisymposium *Numerical methods for plasmonic related phenomena* at SIAM Conference on Computational Science and Engineering (CSE21), Fort Worth (USA).
- 2018 – 2019 Co-organizer of the analysis PhD seminar ([Landau](#)) of Rennes (France).
- Co-organizer of the [Lebesgue PhD meeting](#), Brest (France).
- Co-organizer of the PhD student analysis day, Rennes(France).

## Teaching

- 2018 – 2019 Mathematical Fundamentals, flipped classroom, 30h (Computer Science and Electronics Bachelor).
- Numerical methods in analysis, 24h (Mathematics for Teaching Bachelor).

Tutoring study group on a mathematical article (Mathematics Bachelor).

- 2017 – 2018 Mathematical Fundamentals, flipped classroom, 30h (Computer Science and Electronics Bachelor).  
Mathematic Tools 4, 20h (Physics Bachelor).  
Mathematical Tutoring, 6h (Computer Science and Electronics Bachelor).  
Lab work on eigenvalue computation ([TP2](#), 4h) during the spring school, *Fundamentals and practice of finite elements*, of the Henri Lebesgue Center, Roscoff (France).

- 2016 – 2017 Mathematic Tools 1, 26h (Physics Bachelor).  
Differential Equations 1, 24h (Mathematics Bachelor).  
Lab work, Differential Equations 1, 12h (Mathematics Bachelor).

## Scientific dissemination

- 2018 Oct. Facilitator in mathematics during “Fête de la Science”, Rennes (France).  
Apr. Board for the French tournament for young mathematicians, Rennes (France).  
Jan. Talk for the “5 minutes Lebesgue”. [[Video](#)]  
2017 Mar. Facilitator during “Forum des Mathématiques Vivantes”, Rennes (France).

## Other skills

### Programming languages

- Familiar with C and C++
- Julia
- Python

### Languages spoken

- French (native language)
- English, TOEIC 855/990 in 2015

### Software

- Maple, Matlab, Octave, and Scilab
- XLiFE++, FEM library in C++. [[Webpage](#)]
- Git and  $\text{\LaTeX}$

### Miscellaneous

- Driving License