

# 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 2D whispering gallery modes in optical micro-cavities with varying index**, with Stéphane Balac and Monique Dauge. [in preparation]
- Asymptotics for metamaterial cavities and their effect on scattering**, with Camille Carvalho. [in preparation]
- 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/202101.00001)]

### 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 June Semiclassical analysis meets Numerical Analysis (SCA meets NA), Bath (United Kingdom).  
2020 June Talk at the workshop Numerical Waves in Nice (France). [postpone]  
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).

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### 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).

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### 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