



Benjamin Vial

Posdoctoral Research Assistant | Wave Physics and Metamaterials

Contact

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👤 bvial.info

Information

date of birth

09/11/1984

French citizenship

Languages

French mother tongue

English fluent

Spanish basic

Programming

operating systems

Linux, Windows

languages and scripts

Python, Matlab,

Mathematica, L^AT_EX, C,

C++, Q#, HTML, CSS

applications

git, Comsol

Multiphysics, Fenics,

Gmsh, GetDP, Gimp,

LibreOffice, Labview

Interests

professional

Optics

Photonics

Metamaterials

wave physics

light-matter interaction

homogenization

methods

computational EM

numerical modelling

optimization

techniques

inverse design

finite element method

Fourier modal method

modal analysis

machine learning

Transformation Optics

invisibility cloaking

fabrication

characterization

open source science

personal

playing the guitar

listening to music

football, snowboard,

hiking

Education

- Apr. 2013 PhD in Physics Institut Fresnel, CNRS, Centrale Marseille, Aix Marseille Université, Marseille, France
Optics, Photonics and image processing
- Oct. 2009 Master's degree in Physics Centrale Marseille / Laboratoire de Mécanique et d'Acoustique, CNRS, Marseille, France
Mechanics, Physics and Engineering, specialization in Acoustics
- Oct. 2009 Master's degree in Engineering Centrale Marseille, Marseille, France
High level scientific and technical training

Research activities

- Aug. 2022 Postdoctoral Research Assistant Imperial College London, London, UK
Now
Projet METAVER: energy harvesting with elastic metamaterials. Developing and optimizing models of discrete mechanical lattices and resonators on thin plates.
- Jan. 2019 Postdoctoral Research Assistant Queen Mary, University of London, London, UK
Jul. 2022
ANIMATE project: nonlinear coupling model, homogenization of ferroelectric metamaterials, inverse design for tunability enhancement, microwave and THz material characterization.
- Jan. 2017 Postdoctoral Research Assistant Queen Mary, University of London, London, UK
Dec. 2018
AOTOMAT project : Optimization tools and machine learning for the design of electromagnetic devices and materials.
- Jul. 2014 Postdoctoral Research Assistant Queen Mary, University of London, London, UK
Dec. 2016
QUEST project Transformation Optics applied to the design, fabrication and characterization of novel electromagnetic devices using metamaterials. Development of simulation tools and optimization techniques.
- Nov. 2013 Postdoctoral Research Assistant Institut Fresnel, Marseille, France
Jan. 2014
Numerical study of the coupling of light to subwavelength resonant optical antennas and control of the local density of states.
- May 2013 Postdoctoral Research Assistant Institut Fresnel, Marseille, France
Oct. 2013
Development of simulation tools for ray tracing in complex media, inverse problem of finding index distribution to make light follow a prescribed path, deshomogenization technique with graded index photonic crystals.
- Oct. 2009 PhD in Physics Institut Fresnel – Silios Technologies, Marseille, France
Apr. 2013
Study of open electromagnetic resonators by modal approach. Application to infrared multispectral filtering. (joint academia/industry funding)
FEM modelling of metamaterials, spectral analysis quasi-normal mode expansion. Application to the design of infrared filters for multispectral imaging devices. Fabrication and characterization of reflexion bandcut and transmission bandpass filters.

Awards and honours

- Best PhD thesis 2014 award from the Doctoral School 352, Physics and Condensed Matter Science
- Best PhD thesis 2014 award from CNano PACA, finalized research category

Teaching/supervising experience

feb. 2023 -	PhD co-supervision	Imperial College London, London, UK.
sept. 2023	Visiting student from Politecnico di Milano. Isospectral open cavities and curvilinear homogenization.	
jul. 2023 -	Summer project supervision	Imperial College London, London, UK.
sept. 2023	Applied mathematics undergrad student, 3 months. Optimizing dispersion in discrete phononic lattices.	
sept. 2018	PhD co-supervision	Queen Mary University of London, London, UK.
- apr. 2022	Work with 2 PhD students. Data-driven optimisation of metasurfaces.	
nov. 2019 -	Teaching Assistant	Queen Mary University of London, London, UK.
apr. 2020	Quantum Programming. Lectures and tutorials on quantum physics, gates and circuits. Coding laboratory and projects in Q# and Python. Preparation and correction of exams. (10 Master students, 6 months)	
nov. 2018 -	Co-supervision undergraduate project	Queen Mary University of London, London, UK.
apr. 2019	Multidisciplinary project, 4 students. Detecting emotions with physiological and microwaves measurements.	
may-june 2012	Internship tutor Tutor for an internship, 3rd year student of École Centrale Marseille. Optimization of infrared diffractive filters for infrared imaging.	Institut Fresnel, Marseille, France.
jan.-feb. 2011	Project tutor Tutor for final year project, 5 students, 2nd year in École Centrale Marseille. Design of high efficiency solar cells with metamaterials	Institut Fresnel, Marseille, France.

Administrative experience

nov. 2023	Workshop organization Meeting and workshop on two European projects. Invitations, logistics, catering, technical programme writing.	Imperial College London, London, UK.
2017	Seminars organization Internal seminar of Antennas and Electromagnetics research group	Queen Mary University of London, London, UK.
2017-2018	Grant projects writing Help in writing 2 projects to obtain grants from EPSRC. Both (AOTOMAT et ANIMATE) got accepted.	Queen Mary University of London, London, UK.
Sept. 2018- Jul. 2022	Project management Management of the ANIMATE project: website creation, planning meetings, liaising with academic and industrial partners.	Queen Mary University of London, London, UK.

Publications