

Romain Mottier

✉ <https://romainmottier.github.io/>

✉ romain.mottier@outlook.com

EXPERIENCES

RESEARCH EXPERIENCES

- PhD in Applied Maths - Computational physics - Numerical Analysis** 10/2021 – 12/2024
Institut Polytechnique de Paris (IP Paris) & École Nationale des Ponts et Chaussées (ENPC) & Commissariat à l'Énergie Atomique (CEA) Paris – France
Non-conforming hybrid (HDG/HHO) finite elements methods for modeling and numerical simulation of elasto-acoustic wave propagation.
- Research intern** 03/2021 – 08/2021
Office National d'Études et de Recherches Aéronautiques (ONERA) Toulouse – France
Implementation of Spectral Differences (SD) and a Mimetic method (CDO scheme) to solve Maxwell equations in the time domain.
- Research intern** 05/2020 – 08/2020
European Space Agency (ESA) Noordwijk – Netherlands
Numerical modeling of the temperature distribution on the surface and in the depths of Mercury.

TEACHING EXPERIENCES

- Theoretical and practical work classes** 01/2023 – 05/2023
Paris Dauphine University Paris – France
Grade: 2nd year of Bachelor's degree in Mathematics and Computer science
Course: Numerical methods (Nonlinear equations, polynomial interpolation, quadrature formulas, iterative and direct methods for solving linear systems, eigenvalues and eigenvectors computing)
- Theoretical and practical work classes** 09/2022 – 12/2022
Paris Sorbonne University Paris – France
Grade: 1st year of Master's degree in Computational Mechanics
Course: Numerical methods (Linear systems, finite differences, continuum mechanics)

EDUCATION

- University exchange: MSc Numerical Methods in Engineering** 09/2020 – 02/2021
Universitat Politècnica de Catalunya (UPC) Barcelona – Spain
Numerical methods studied: Discontinuous Galerkin (DG), eXtended FEM (XFEM), Phase-field models, Meshless methods
- MSc in engineering: Modeling and fluid-structure computation** 09/2018 – 09/2021
Université de Toulon, École d'ingénieur SeaTech Toulon – France
Cross-skills in numerical methods, applied mathematics and mechanics:
Finite Volume / Finite Elements / Finite Differences / Monte-Carlo /
Newton–Raphson / Runge–Kutta / Continuum Mechanics / Fluid Mechanics

SKILLS

Applied mathematics - Numerical methods - Numerical analysis - Numerical modeling
Implementation of numerical methods to perform numerical simulations for problems involve in science and engineering
Programming languages: Fortran, C/C++, Python, Matlab, L^AT_EX, Git

RESEARCH WORK

ARTICLES & PREPRINTS

Hybrid high-order methods for elasto-acoustic wave propagation in the time domain

Submitted to M2AN - preprint: [arXiv]

Unfitted HHO methods with polynomial extension

Preprint soon available

Elasto-acoustic wave propagation in complex geophysical media simulating using HHO methods

Preprint soon available

CONGRESS

Hybrid high-order methods for time-dependent, coupled elasto-acoustic wave propagation

World Congress on Computational Mechanics (WCCM)

Vancouver (Canada) - July 2024

*European Congress on Computational Methods in Applied Sciences
and Engineering (ECCOMAS)*

Lisbon (Portugal) - June 2024

Congress of Young Researchers in Applied Mathematics (CJCMA)

Paris (France) - September 2023

Unfitted HHO method stabilized by polynomial extension

National Congress of Numerical Analysis (CANUM)

Ile de Ré (France) - May 2024

Numerical study of energy transfer in sedimentary basins using high-order methods

American Geophysical Union (AGU)

San Francisco (USA) - December 2023

REFEREES

Alexandre Ern

Main advisor (PhD)

Researcher at CERMICS since 1995, Senior Researcher since 2011

Joint Senior Researcher at INRIA in the SERENA team (since 2016)

Professor at Ecole des Ponts (since 1997), Associate Professor at Ecole Polytechnique (2010-22)

Email adress: alexandre.ern@enpc.fr

Laurent Guillot

Advisor (PhD)

Researcher at CEA

Email adress: laurent.guillot.blr@gmail.com

Guillaume Delay

Assistant professor at Sorbonne University, Laboratoire Jacques-Louis Lions

Researcher at INRIA in the COMMEDIA team

Email adress: guillaume.delay@sorbonne-universite.fr

Guillaume Legendre

Advisor (Teaching experience)

Professor at Paris Dauphine University

Email adress: guillaume.legendre@ceremade.dauphine.fr