Romain Mottier

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Experiences

PhD in Applied Maths - Computational physics - Numerical Analysis 10/2021 – 12/2024
École Nationale des Ponts et Chaussées (ENPC) & Commissariat à l'Énergie Atomique (CEA) & Institut Polytechnique de Paris (IP Paris) *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 Aérospatiales (ONERA) *Toulouse – France*
Study, implementation and comparison 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) *Nordwijck – Nedetherland*
Numerical modeling of the temperature distribution on the surface and in the depths of Mercury. High-order finite differences scheme in spherical coordinates

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-strucutre 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, LaTeX, Git

Research work

Publications

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*