

# Romain Mottier

🔗 <https://romainmottier.github.io/>

✉ [romain.mottier@outlook.com](mailto:romain.mottier@outlook.com)

## EXPERIENCES

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**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) & Paris – France*

*Commissariat à l'Énergie Atomique (CEA)*

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*

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 – Nedetherland*

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

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**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

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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<sup>A</sup>T<sub>E</sub>X, Git

## RESEARCH WORK

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### 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

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#### **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 Legendre**

Advisor (Teaching experience)

*Researcher at CERMICS since 1995, Senior Researcher since 2011*

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

#### **Sébastien Pernet**

Advisor (Master's thesis)

*Researcher at ONERA*

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