

# Ronan Dupont

## Curriculum Vitae

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*Looking for a Post-Doctoral position in Applied Mathematics*

## Education

- 2021–2024 **PhD, Applied Mathematics for Computational Physics**, GeoSciences, IMAG, CNRS, Montpellier University, Montpellier, France.  
Wave-morphodynamic coupling of the coastline by minimization principle. Under the supervision of Pr. Mohammadi Bijan and Pr. Bouchette Frédéric ([PDF](#)).
- 2018–2021 **Advanced Engineering Master in Computational Fluid Dynamics.**, SeaTech, Engineering School, Toulon University, France.
- 2020–2021 **Master in Marine Sciences**, University of Toulon, France.  
Physics of the Environment for the Evaluation of Risks (PHYMER).
- 2016–2018 **Higher education Program**, Caen, France.

## Publications

### Journal Articles

- 2024 **Ronan Dupont**, Frédéric Bouchette, and Bijan Mohammadi. Beaches morphodynamic modeling based on hadamard sensitivity analysis. ***Ocean Modelling***, page 102370. Elsevier, 2024, ( **Impact Factor: 3.2** ), ([PDF](#)).
- 2023 **Ronan Dupont**, Megan Cook, Frédéric Bouchette, Bijan Mohammadi, and Samuel Meulé. Sandy beach dynamics by constrained wave energy minimization. ***Ocean Modelling***, page 102197. Elsevier, 2023, ( **Impact Factor: 3.2** ), ([PDF](#)).

### In Conference Proceedings

- 2022 **Ronan Dupont**, Megan Cook, Frédéric Bouchette, Bijan Mohammadi, and Damien Sous. Optimorph: un modèle de morphodynamique du littoral par principe de minimisation. analyse de sensibilité en 1d et application multi-1d. volume 17, pages 327–336. JNGCGC, 2022, ([PDF](#)).

### In progress (Submitted)

- 202X **Ronan Dupont**, Mathias Dauphin and Romain Mottier, An Arbitrary-Order Virtual Element Method for the Helmholtz Equation Applied to Wave Field Calculation in Port, submitted to Ocean Modelling, ([DRAFT](#)).

## Research Experience

### Montpellier University

- 2024 **Solving the mild-slope equation using the Virtual Element Method (VEM).**  
Virtual element method of order  $k$  with Robin's Boundary condition. Application to a concrete problem: the port of Cherbourg, ([PDF](#)).

Associate : **M. Mathias DAUPHIN**, PhD students on high-order numerical methods.

## SeaTech, Engineering School, Toulon University

### 2021 **2D mesh of a sphere.**

Modeling the surface mesh (2D) of a sphere in Fortran 90 and display in Python. Create types and functions to number vertices and store their coordinates. Application to poisson problems.

Advisor : **Pr. Cédric GALUSINSKI**, *Professor, Department of Mathematics, IMATH, Toulon University* ([Personal Web-page](#)).

### 2021 **Sudoku solving using a genetic algorithm method.**

Establishing the optimization method for a given problem.

Advisor : **Dr. Sylvain MAIRE**, *Associate Professor, Department of Mathematics, IMATH, Toulon University*

### 2021 **Resolution of bi-fluid Euler equations, application with the BBAMR code.**

Resolution in Fortran 90. Solving by the Finite Volume method using different schemes (Godunov, HLLC, Lax) on Fortran.

Advisor : **Dr. Frederic GOLAY**, *Associate Professor, Department of Mathematics, IMATH, Toulon University* ([Personal Web-page](#)).

### 2020 **Modeling the spread of epidemics in France using the SIR model.**

Modeling and solving systems of partial differential with diffusion in Python. Change from SIR to SZR model of zombie propagation. zombie propagation.

Advisor : **Dr. Gloria FACCANONI**, *Associate Professor, Department of Mathematics, IMATH, Toulon University* ([Personal Web-page](#)).

## Segula Technologies, Trappes, France

### 2021 **CFD optimization of the performance of windsurf sails intended for high speeds.**

6-month end-of-studies research internship.

Advisor : **M. Laurent LANQUETIN & Dr. Thibaut ALLEAU.**

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## Talks

### 2024 **PhD Defense - Montpellier (France).**

On September 30, 2024, I defended my thesis in Montpellier ([PDF](#)).

### 2024 **NuMerics2024 : Numerical Methods for Problems in Fluid Dynamics - Naples (Italy).**

I was a **guest speaker** at this workshop and my work was entitled *Numerical solution of Mild-slope equation using Virtual Element Method* ([Conference website](#)), ([PDF](#)).

### 2023 **AGU 2023 - San Francisco (United States).**

I presented a poster at this international conference showing *The generic version of the OptiMorph model* ([Conference website](#)), ([PDF](#)).

### 2023 **Journées de Modélisation des Vagues à Phases Résolues - Île d'Aix (France).**

I took part in this workshop and presented *The OptiMorph model forced by a wave-to-wave resolution model (Shallow Water)* ([Conference website](#)), ([PDF](#)).

### 2022 **Journée Nationales Génie Côtier - Génie Civil 2022 - Chatou (France).**

I took part in this conference and presented *OptiMorph: a coastal morphodynamics model based on the minimization principle. Sensitivity analysis in 1D and multi-1D application.* ([Conference website](#)), ([PDF](#)).

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## Skills

Programming Python, Matlab, Fortran, C, C++, L<sup>A</sup>T<sub>E</sub>X.

CFD Software OpenFoam, Fluent, ADINA.

Optimization Optimal transport, Gradient descent, Genetic algorithms, Stochastic methods.

HPC Bash, Slurm.

Interests Numerical modelling, Fluid mechanics, Coastal physics, Finite Elements, Virtual Elements, Finite Volumes.

## Languages

French  Native language.  
English  Fluent - B2/C1.  
Italian  Intermediate - B1.  
German  Pre-Intermediate - A2.  
Spanish  Basic - A1.

## Teaching Experience

- 2025 **High school mathematical teacher**, *High school*, Bordeaux, France.
- 2023-2024 **Algebra, Calculus, Cardinality, Geometry**, *First year of mathematics degree*, Montpellier University, France, ([Article mentioning my support for a top sportswoman](#)).
- 2023 **Advanced coastal and port hydromorphodynamics**, *Master of Coastal Engineering*, Montpellier University, France, ([Course material](#)).
- 2023 **Coastal and port hydromorphodynamic modeling tools: OptiMorph**, *Master of Coastal Engineering*, Montpellier University, France, ([Course material](#)).
- 2023 **Python Courses**, *Master of Coastal Engineering*, Montpellier University, France, ([Course material](#)).

## Referees

### Pr. Bouchette Frederic

*Professor, Department of  
GeoSciences*

Géosciences Montpellier

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### Pr. Bijan Mohammadi

*Professor, Department of  
Mathematics*

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### Pr. Ersoy Mehmet

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