

# Romain Lemoire

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## **CIFRE PhD in Applied Mathematics : Modeling and patient specific fluid-structure interaction simulations of aortic pathological configurations | Inria & CASIS**

2024-2027 | Supervisors : Miguel Fernandez & Damiano Lombardi

CIFRE PhD between Inria Paris and CAISIS.

The aim of the PhD is to reconstruct the flow within pathological aortas using an inverse model based on fluid-structure interaction and 4D-Flow MRI data. Direct use of the data is not possible due to noise, which presents significant challenges and prevents the accurate computation of certain biomarkers that could improve the diagnosis of aortic aneurysms.

### **Scientific talks :**

- 12th biennial of SMAI, France, June 2025, talk in mini symposium

## **Master 2 : IMPE (+work-study program at IFPEN) | Sorbonne University**

Mathematical Engineering for Industry

2022-2023

### Notable Courses :

- Continuum Mechanics
- Methods for Partial Differential Equations
- Numerical Optimization
- Parallel Computing
- Introduction to FreeFEM++
- Modeling Applied to Biology
- Project in Microfluidics
- Project using Code\_Aster

### Work-study program (IFPEN) :

#### Mission :

Enable the use of machine-learning-based constitutive laws within a multi-dimensional porous media simulator.  
Study and mitigate the impact on solutions when approximate laws are involved in nonlinear algebraic systems solved with Newton's method.

## **Master 1 : Mathematics and Applications | Sorbonne University**

2021-2022

### Courses and Projects :

- Scientific Computing for Large Linear Systems
  - Implementation of the GMRES solver in C++
- Numerical Optimization
- Commutative Algebra
- Fundamentals of Functional Analysis
- C++ Programming
- Probability and Statistics

## Education

## Languages and Computing Skills

### **Computing :**

- C++
- Python
- LaTeX
- Paraview

### **Languages :**

- bilingual in French and Spanish
- academic English