



TIPHAINE DELAUNAY

Born in 1997, Paris
Driving license

<https://tiphainedelaunay.github.io>

EDUCATION

PhD in applied mathematics,

2020 - 2023

MEDISIM, Inria & École Polytechnique, Institut Polytechnique de Paris - CNRS, Palaiseau, France

Supervisors : Philippe Moireau and Sébastien Imperiale

Title : *Adaptative observers for wave equations and associated discretization: formulations and analyses*

Defense : December 19 2023, Inria, Palaiseau

Jury :	Laurent Bourgeois	Professor, ENSTA Paris	President
	Lucie Baudouin	Research director, CNRS	Rapporteur
	Takéo Takahashi	Professor, Université de Lorraine	Rapporteur
	Yannick Privat	Professor, Université de Lorraine	Examiner
	Sébastien Imperiale	Researcher, Inria	Director
	Philippe Moireau	Research director, Inria	Director
	Muriel Boulakia	Professor, Univ. Versailles Saint-Quentin	Guest

Engineering diploma

2015 - 2020

INSA Rouen Normandie, Saint-Etienne du Rouvray, France

Major : Applied mathematics

Master's degree in applied mathematics

2019 - 2020

Université de Rouen Normandie, Saint-Etienne du Rouvray, France

Thesis : *3D reconstruction from two-dimensional slices applied to medicine*

RESEARCH EXPERIENCE

Post-doctorate

depuis Février 2024

MONC, Inria & Institut de Mathématiques de Bordeaux, Talence, France

Supervisors : Annabelle Collin, Christèle Etchegaray and François Moisan

Topic : *Deciphering tumor response to propranolol in angiosarcomas by mathematical modeling and data assimilation*

Research internship

Mars - Août 2020

MEDISIM, Inria & École Polytechnique, Palaiseau, France

Topic : *Data assimilation by observers strategies for wave equations*

Research internship

Juin - Août 2018

Université de Dundee, Dundee, Écosse

Topic : *Elliptic curves and cryptography*

TEACHING EXPERIENCE

Tutored interdisciplinary project,

2024

Master Cancer Biology of University of Bordeaux, Talence, France

Master's degree (M2) - 5h - Creation and supervision of a project: *Mathematical modeling of the growth of spheroids in free growth and in responses to a non-cytotoxic drug*

Introduction to PDEs and finite differences

2022 & 2023

ENSTA Paris, Palaiseau, France

Niveau L3 - 2 x 14h - Tutorial, practical class, exam monitoring, grading

Finite elements method

2021 & 2022

ENSTA Paris, Palaiseau, France

Niveau M1 - 2 x 14h - Tutorial, practical class, exam monitoring, grading

COMMUNICATIONS

Talks at national and international conferences

- **Rencontres Normandes sur les aspects théorique et numérique des EDP** (*Invited*) 2024
Saint-Etienne du Rouvray, France
- **WAVES** 2022
Palaiseau, France
- **ECCOMAS** 2022
Oslo, Norvège
- **Rencontre Jeunes Chercheuses, Jeunes Chercheurs : Ondes** (*Invited*) 2022
Inria Université Côte d'Azur, Sophia Antipolis, France
- **Rencontre pour les Ondes et leurs applications** (*Invited*) 2022
INSA Rouen Normandie, Saint-Etienne du Rouvray, France
- **Congrès des Jeunes Chercheurs en Mathématiques Appliquées** 2021
Palaiseau, France

Talk at seminar

- **Séminaire EDP de Nancy** (*Invited*) 2024
Institut Elie Cartan de Lorraine, Nancy, France
- **Seminar on the mathematical and statistical foundation of future data-driven engineering** 2023
Isaac Newton Institute, Cambridge, Royaume-Uni
- **Workshop on assimilation, control and computational speedup** 2023
LAGA, Université Sorbonne Paris-Nord, Villetaneuse, France

Posters

- **Journées des rencontres IDEFIX-MEDISIM-POEMS** 2020 & 2021
Palaiseau, France

PUBLICATIONS

Adaptative observers for wave equations and associated discretizations: formulations and analysis

Tiphaine Delaunay (2023)

Thèse de doctorat, Institut Polytechnique de Paris

 <https://theses.hal.science/tel-04511683v1>

Mathematical analysis of an observer for solving inverse source wave problem

Tiphaine Delaunay, Sébastien Imperiale, Philippe Moireau (2024)

Accepted in *Inverse problem and imaging*, under revisions

 <https://hal.science/hal-04344193v1>

Uniform boundary stabilization of a high-order finite element space discretization of the 1-d wave equation

Tiphaine Delaunay, Sébastien Imperiale, Philippe Moireau (2024)

Published in *Numerische Mathematik*

 <https://hal.science/hal-04172229v1>

DOI: 10.1007/s00211-024-01440-9

Solving inverse source wave problem - From Carleman estimates to observer design

Muriel Boulakia, Maya de Buhan, Tiphaine Delaunay, Sébastien Imperiale, Philippe Moireau (2024)

Accepted in *Mathematical Control and Related Fields*, under revisions

 <https://hal.science/hal-04788439v1>

SCIENTIFIC POPULARIZATION

Participation to Science fair

Institut Polytechnique de Paris, Palaiseau, France

2021

Production of a popularization video

Topic : *Mathematical modelling and computer simulation*

 <https://www.youtube.com/watch?v=28C1C3UmStE>

2021

Animation of "Rendez-vous des jeunes mathématiciennes et informaticiennes"

Online

2021

Popularization conference in a High School

Académie de Créteil, online

Topic : *Cryptography*

2021

ACADEMIC INTERESTS

- Inverse problem
- Data assimilation
- Mathematical modelling with PDEs
- Evolution problems
- Wave and applications

PROGRAMMING

- Java
- C++
- Matlab
- Python
- R
- FreeFEM++

SOFTWARES

- LaTeX
- Monolix
- Office
- Photoshop
- Paraview

LANGUAGES

- French: Native
- English: Strong reading, writing and speaking skills (TOEIC 825)
- Spanish: Beginner