

Tom Matrat



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📍 Paris, France

LANGUAGES

French (native)

English (B2)

PROGRAMMING LANGUAGES & TOOLS

Python, R, SQL

COPASI, LaTeX

Office Suite

INTERESTS

- Football
- Skiing
- Nature
- Sports
- Sneaker culture

EDUCATION

2026-Present	PhD in Applied Mathematics MAP5, Université Paris Cité, Paris, France <i>Thesis: A nonlinear delay integro-differential equation model of the synergistic effect of chemotherapy and immunotherapy.</i> <i>Supervisors: Fabien Crauste, Emma Leschiera & Chiara Villa.</i>
2024-2026	Master's Degree in Applied Mathematics - Computational and Mathematical Biology (CMB) Aix-Marseille Université (AMU), France, Graduated with highest honours (mention très bien) <i>PDEs, numerical analysis, applied mathematics, dynamical systems in biology, statistics, immunology, machine learning, programming, optimization, graph theory, neuroscience</i>
2021-2024	Bachelor's Degree in Mathematics Aix-Marseille Université (AMU), France, Graduated with high honours (mention bien) <i>Differential equations, numerical analysis, topology and differential calculus, algebra, analysis, geometry, statistics, informatics</i>
2020-2021	Preparatory Classes for Engineering Schools (CPGE), MPSI track Lycée Louis Thuillier, Amiens, France
2017-2020	French Baccalauréat in Science, Mathematics specialization Lycée Carnot, Cannes, France

RESEARCH INTERNSHIP (MASTER YEAR 2)

January 2026 – July 2026

MAP5, Université Paris Cité and DVRC - École Supérieure d'Ingénieurs Léonard de Vinci (ESILV)

Supervisors: Chiara Villa (MAP5) & Emma Leschiera (DVRC)

Project: Mathematical modelling of the synergistic effect of chemotherapy and immunotherapy across scales

- Formulation of agent-based model and formal derivation of the corresponding continuum models (PDE-ODEs)
- Numerical simulation of the agent-based and continuum models
- Formal asymptotic analysis of the continuum model
- Interpretation of results in a biological context

SCIENTIFIC ACTIVITIES:

- **Poster presentation:** Conference on Mathematical Modelling of the Emergence of Collective Behaviours, June 3, 2026

RESEARCH INTERNSHIP (MASTER YEAR 1)

May 2025 – July 2025

Jean-Alexandre Dieudonné Laboratory (LJAD), Université Côte d'Azur, Nice, France

Supervisors: Elisabeth Pécou

Project: Exploring Learning Time in the Dynamics of the p53 Pathway

- Study of dynamical systems (ODEs) (general concepts and local bifurcations)
- Analysis of intracellular regulatory networks
- Numerical modelling and simulations, using COPASI software
- Numerical simulation and data analysis using Python

CONFERENCES, WORKSHOPS & SEMINARS

- Groupe de Travail MAS and des Éphémères — MAP5, January/May 2026
- Seminar on Mathematical Modelling in Biology and Health — Laboratoire Jacques-Louis Lions, April 9, 2026
- Master Class ANADEAL — CIRM, May 24-25, 2024
- CENTURI seminars — 2024-2025

SKILLS

- Dynamical Systems: study of differential equations, stability analysis
- Partial Differential Equations & Numerical Analysis: boundary value problems, variational formulation, finite difference discretization, implementation of explicit and implicit schemes, convergence and stability analysis
- Optimization: optimality conditions, gradient descent, Newton's methods, constrained optimization, simplex method
- Graph Theory & Algorithms
- Statistical Learning: introduction to supervised and unsupervised methods
- Differential Calculus
- Biological Data Analysis: processing and interpretation of experimental biological data