Thomas Saigre

PhD. Student in Applied Mathematics

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Employment History

2021 – present **PhD. student,** Institut de Recherche Mathématique Avancée, Université de Strasbourg.

Education

2021 – present **Ph.D., Université de Strasbourg,** Institut de Recherche Mathématique Avancée.
Thesis title: *Mathematical modeling, simulation and reduced order modeling of ocular blood flows and their interactions: Building the Eye's Digital Twin.*

2019 – 2021 **Master Calcul Scientifique et Mathématiques de l'Information,** Université de Strasbourg. (Mention Très Bien)
Data processing, learning algorithms, Signal processing, Modeling / Simulation / Optimization, High performance computing

2017 – 2021 **Magistère de Mathématique,** Université de Strasbourg. (Mention Bien)

2015 – 2017 **Classe Préparatoire aux Grandes Écoles,** Lycée Camille Guérin, Poitiers.
MPSI/MP* (Mathématiques, Physique et Sciences de l'Ingénieur)

Teaching

2021 – 2024 **Scientific Computing,** Université de Strasbourg, L2
Tutorial, practical work in Python.

Cercle Mathématique de Strasbourg.
Structure for high-school students taking place in the laboratory once a week.

2021 – 2022 **Applied numerical analysis,** Université de Strasbourg, L2
Tutorial, practical work in Scilab.

2021, 2024 **Khôlles of Mathematics,** Université de Strasbourg and Lycée Kléber, L1 / MPSI

Research Publications

Journal Articles

1. P. J. Hossie, B. Laroche, T. Malou, L. Perrin, T. Saigre, and L. Sala, "Simulating interactions in microbial communities through Physics Informed Neural Networks: towards interaction estimation," Feb. 2024, working paper or preprint. URL: https://hal.inrae.fr/hal-04440736.
2. T. Saigre, C. Prud'Homme, and M. Szopos, "Model order reduction and sensitivity analysis for complex heat transfer simulations inside the human eyeball," Dec. 2023, working paper or preprint. URL: https://hal.science/hal-04361954.

Conference Proceedings

1. T. Saigre, C. Prud'Homme, M. Szopos, and V. Chabannes, "A coupled fluid-dynamics-heat transfer model for 3D simulations of the aqueous humor flow in the human eye," in *CMBE24*, Arlington (Virginia), United States, Jun. 2024. URL: https://hal.science/hal-04558924.

Skills

Applied Mathematics

Modelisation — Partial differential equations, ordinary differential equations, optimization, control theory …

Simulation — Finite element method, Reduced Order Modelling, sensitivity analysis …

Coding

Python — NumPy, Plotly, tensorflow, Keras …

C/C++ — Standard library, MPI, …

Other — LaTeX, Julia, OCaml …

Miscellaneous Experience

2022-2023 — Co-organizer of the **PhD seminar** at IRMA.

Member of the **Young Researcher Comitee** of the ITI IRMIA++.

TFJM^2

2023, 2021, 2018 — Member of the Local Organization Comitee of the **Tournoi Français des Jeunes Mathématiciennes et Mathématiciens**.

2023, 2024 — Supervision of the team Cercle Mathématiques de Strasbourg.

Scientific animation and mediation

2024, 2023 — Supervision of a research workshop at **Rendez-vous des Jeunes Mathématiciennes et Informaticiennes** in Strasbourg.

2023, 2022 — **Fête de la science :** Animation of the Enig'maths course and the IRMA stand on the cube and its bosses.