



Physiologie de la Reproduction et des Comportements
INRAE, F-37380 Nouzilly, France

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📄 <https://lfostier.github.io>

Louis Fostier

Education

2022– **PhD candidate on *Analysis and calibration of structured population dynamics models: application to cell populations***, team BIOS, INRAE, PRC, Nouzilly, France.

Mathematical modelling in biology, Well-posedness and long-time analysis of size-structured population dynamics models, numerical methods for inverse problem.

Keywords: Size-Structured Population Dynamics ; Asymptotic Behavior ; Bifurcation Analysis ; Inverse Problem ; PINNs ; Reproductive Biology

Advisors: Frédérique Clément (team MUSCA, INRIA), Romain Yvinec (team BIOS, INRAE) and Violette Thermes (LPGP, INRAE).

2022–2020 **Masters of Applied Mathematics**, *Université de Rennes 1*.

Scientific computing, modelling, numerical analysis. Obtained with very good honors.

2017–2020 **Bachelor of Mathematics**, *Université de Rennes 1*.

Obtained with very good honors.

Internship and Hackaton

2023 **6 weeks hackaton on *Scientific machine learning for equation discovery***, *Centre d'Été Mathématique de Recherche Avancée en Calcul Scientifique*, Marseille, France.

2022 **M2 internship on *Modelling of the female fish germ cell population***, team MUSCA, INRIA, Palaiseau, France.

Advisors: Frédérique Clément (team MUSCA, INRIA) and Romain Yvinec (team BIOS, INRAE)

2021 **M1 internship on *Scientific computing and modelling for biofilms***, IRMAR, CNRS, Rennes, France.

Advisors: Fabrice Mahé (IRMAR, CNRS) and Bénédicte Martin (NUMECAN, INSERM).

Publications

Preprint

2025 **Fostier L., Dauger A., Yvinec R., Ribot M., Audebert C., Soula H.**, Rapid cell turnover to model adipocyte size distribution, accepted in *Journal of Theoretical Biology*.

<https://hal.science/hal-05105900> 

Proceeding

2025 **Fiorini C., Flint C., Fostier L., Franck E., Hashemi R., Michel-Dansac V., Tenachi W.**, Generalizing the SINDy approach with nested neural networks, <https://hal.science/hal-04557263v1>



Journal Article

2025 **Clement F., Fostier L., Yvinec R.**, Bifurcation analysis of a size-structured population model: Application to oocyte dynamics and ovarian cycle, in *SIAM Journal on Applied Dynamical Systems (SIADS)*.

<https://doi.org/10.1137/24M1705147>

- 2022 **Chathoth K., Fostier L., Martin B., Baysse C., Mahé F.**, A Multi-Skilled Mathematical Model of Bacterial Attachment in Initiation of Biofilms , in *microorganisms*.
<https://www.mdpi.com/2076-2607/10/4/686>

Communications in conference and seminar

Oral communications

- 2025 Math Bio seminar of Institut Denis Poisson, September 24, Tours
2025 Differential Equations and Applications to Biology, June 16-20, Le Havre
2025 Biennale de la SMAI, June 02-05, Carcans-Maubuisson
2025 Métaprogramme DIGIT-BIO seminar, December 12-13, Lyon
2024 Métaprogramme DIGIT-BIO seminar, December 12-13, Lyon
2024 Congrès des Jeunes Chercheur.e.s en Mathématiques Appliquées, October 28-30, Lyon
2024 Biology and Medicine Through Mathematics Conference, May 15-17, Richmond USA
2024 Math bio seminar, March 22, Duke University USA
2023 Journées Math-Bio-Santé, November 27 - December 1, Paris Marne La Vallée
2023 Math Bio seminar of Institut Denis Poisson, July 13, Orléans
2023-2025 PhD student seminar of the research unit Physiologie de la Reproduction et des Comportements
2023-2024 PhD student seminar week of Institut Denis Poisson

Posters

- 2024 European Conference on Mathematical and Theoretical Biology, July 22-26, Toledo
2024 Journées Math-Bio-Santé, June 24-28, Nantes
2023 Journées reprosciences, 3-5 May, Paris

Teaching and tutoring

- 2024 **L1 classes of Calculus and mathematical reasoning**, Université de Tours, France.
30 hours
2022 **L1 classes of Algebra and Analysis**, Université de Tours, France.
54 hours
2021 **Assistance and pedagogical support for disabled student**, Université de Rennes 1, France.
2020 **Educational tutoring for students in L3 mathematics**, Université de Rennes 1, France.

Popularisation

- 2024 **IA workshop**, *Seminar of the INRAE research unit Physiologie de la Reproduction et des Comportements*.

Research stays abroad

- 2024 **Duke University**, *March 11 – May 10, 2024*, INRIA funding (€10k) – Sabbatical program: Dissemination of PhD research work, support from Kevin Flores (NC State University) to explore BINN (Biologically Informed Neural Network) methods.

Awards

- 2024 Best poster award - European Conference on Mathematical and Theoretical Biology , Toledo

Computer skills

- Basic C++, FORTRAN
Intermediate C, Matlab, FreeFem++
Advanced PYTHON

Referees

Dr. Frédérique Clément

Research Director, head of MUSCA team

Inria Saclay

✉ frederique.clement@inria.fr

Dr. Magali Ribot

University professor

Institut Denis Poisson

✉ magali.ribot-barre@univ-orleans.fr

Dr. Romain Yvinec

INRAE Research Director, head of BIOS team

INRAE Val-de-Loire

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