Timothée Crin-Barat

21A Bismarckstr, 91054, Erlangen, Allemagne

+33 644752366

timothee.crin-barat@fau.de

Website: timotheecrinbarat.com

Date of birth: 28.09.1992

Research experiences

Oct 2022-Sep 2024

Postdoctoral researcher at Friedrich-Alexander University, Erlangen-Nuremberg,

Supervised by Enrique Zuazua, in the Chair for Dynamics, Control and Numerics – Alexander von Humboldt Professorship

Jan 2022-Sep 2022

Postdoctoral researcher at Deusto University, Bilbao

Supervised by Enrique Zuazua. ERC DyCon

Sep 2021-Dec 2021

Research assistant at University Paris-Est Créteil

Financed by the ANR project INFAMIE (ANR-15-CE40-0011)

Oct 2017 – Dec 2021

Ph.D. in Mathematics

Title : *Partially Dissipative Hyperbolic Systems and application to fluids mechanics.*
Thesis defense : 13 December 2021, University Paris-Est Créteil
Supervisor: Raphaël Danchin
Referees: Karine Beauchard and Jean-François Coulombel
Examiners: Sylvie Benzoni-Gavage, Didier Bresch, Roberto Natalini and Denis Serre.

Teaching experiences

2022-2024

Research and teaching assistant at Friedrich-Alexander University

- 50 hours of lectures and exercise classes for the master's course: "Ordinary differential equations and transport equations".
- 12 hours of exercise classes for the master's course "Data-driven methods for dynamic systems". Programming language used: Python.
- 42 hours of exercises class for the master's course "Probability and stochastic processes" designed for medical engineering students.

2018-2021

Research and teaching assistant at University Paris-est Créteil

- 320 hours of analysis and algebra instruction for undergraduate students.

Education background

2015 - 2017

Master's Degree in Mathematics of Modelling

Sorbonne University

- Diploma obtained with honors.
- Specialized in Numerical Analysis and Partial differential equations:

2014 - 2015

Bachelor's Degree in Mathematics

Sorbonne University

- Diploma obtained with honors.

2011 - 2014

Preparation for national competitive entrance exams leading to French "grandes écoles", CPGE MP/MPSI, major in mathematics and physics.

High school Gustave Monod - Enghien-Les-Bains

Published papers

« Global existence results in the critical regularity setting for partially dissipative one-dimensional hyperbolic systems, and applications » with Raphaël Danchin. Pure and Applied Analysis, 4(1):85–125, 2022.

« Partially dissipative hyperbolic systems in the critical regularity setting : the multi-dimensional case » with Raphaël Danchin. Journal de Mathématiques Pures et Appliquées Volume 165, Pages 1-41, 2022.

« Global existence result for partially dissipative hyperbolic systems in the L^p framework and relaxation limit » with Raphaël Danchin. Mathematische Annalen 386(2), 2159–2206, 2023.

« Pressure-relaxation limit for a one-velocity Baer–Nunziato model to a Kapila model » with Cosmin Burtea and Jin Tan. Mathematical Models and Methods in Applied Sciences Vol. 33, No. 04, 687-753, 2023

« Diffusive relaxation limit of the multi-dimensional hyperbolic Jin-Xin system » with Ling-Yun Shou. Journal of Differential Equations Vol. 357, 302-331, 2023.

« The hyperbolic-parabolic chemotaxis system modelling vasculogenesis: global dynamics and relaxation limit » with Qingyou He and Ling-Yun Shou. SIAM Journal on Mathematical Analysis Vol. 55, Iss.5, 2023.

« Relaxation approximation and asymptotic stability of stratified solutions to the IPM equation » with Roberta Bianchini and Marius Paicu, Arch Rational Mech Anal 248, 2, 2024.

Submitted papers

« On the decay of one-dimension locally and partially dissipated hyperbolic systems » with Nicola de Nitti and Enrique Zuazua, arXiv:2206.00555, 2022.

« Quantitative derivation of a two-phase porous media system from the one-velocity Baer-Nunziato and Kapila systems » with Ling-Yun Shou and Jin Tan, arXiv:2211.08781, 2022.

« Large time asymptotics for partially dissipative hyperbolic systems without Fourier analysis: application to the nonlinearly damped p-system » with Ling-Yun Shou and Enrique Zuazua, arXiv:2308.08280, 2023.

« Strong relaxation limit and uniform time asymptotics of the Jin-Xin model in the L^p framework » with Ling-Yun Shou and Jianzhong Zhang, arXiv:2311.04105, 2023.

« Cattaneo-Christov relaxation of heat-conductive fluids: error estimates in the multi-dimensional and small data case » with Shuichi Kawashima, Jiang Xu and Enrique Zuazua, work in progress, 2024.

« Well-posedness and relaxation limit of the three-dimensional Euler-Maxwell system: quantitative error estimates » with Yue-Jun Peng, Ling-Yun Shou and Jiang Xu, work in progress, 2024.

« Numerical hypocoercivity for hyperbolic systems and hyperbolic approximations » with Dragos Manea and Enrique Zuazua, work in progress, 2024.

Research talks at international conferences

- June 2024, Equadiff-conference, Karlstad, Sweden.
- April 2024, Conference "Perspectives on Multiphase Fluid Dynamics, Continuum mechanics and Hyperbolic Balance laws", Trento, Italy.
- 20/11/23 & 23/11/23 3-hour Lecture, NUAA University, Nanjing, China.
- 08/11/23, "Critical phenomena in Nonlinear Partial Differential Equations, Harmonic analysis, and Functional inequalities" - in honor on Professor Takayoshi Ogawa's 60th birthday -, Sendai International Center, Japan
- 22/03/23 Journées Jeunes EDPistes, Tours
- 05/12/22 Mathflows - CIRM, Marseille
- 26/08/22 and 01/09/22 IX Partial differential equations, optimal designs and numerics, Benasque.
- 05/04/22 CIRM -Jean-Morlet Chair 2022 - Research School: Mathematical Advances in Geophysical Flows.
- 16/06/21 *International Workshop on Recent Advances in Nonlinear PDE* - Nanjing University.

Research talks at research seminars

- 26/03/24 Seminar MAC, University of Toulouse.
- 12/03/24 Seminar of Applied Analysis, University of Lyon.
- 23/02/24 PDE seminar, Lorraine University, Metz
- 13/02/24 Seminar of nonlinear analysis, KIT Karlsruhe.
- 25/01/24 Numerical Analysis seminar, TU Darmstadt.
- 24/11/23 Séminaire d'Analyse, Tongji University, Shanghai, China.
- 21/09/23 Séminaire Analyse numérique, IRMAR
- 07/07/23 Reading group ergo-hf (led by Vincent Duchêne).
- 27/03/23 Seminar of Applied Analysis, University of Amiens
- 07/02/23 Seminar of Analysis, Institut Mathématique de Bordeaux
- 02/02/23 Seminar of Analysis, IMJ-PRG, University of Paris
- 11/11/22 Seminar of Analysis, FAU Erlangen-Nuremberg.
- 20/06/22 Workshop "Recent Advances in Analysis and Control". FAU
- 06/04/22 Tongji University Seminar. Shanghai, China.
- 19/01/22 CCM Seminar - Deusto University.
- 2018-2020 3 talks at the PhD seminar of University Paris-Est Creteil.

Scientific visits

- 30 January - 3 February 2023, University of Paris, IMJ-PRG Institute. Research discussions with Cosmin Burtea.
- 6-8 February 2023, Institut Mathématiques de Bordeaux. Research discussions with Marius Paicu.
- 18-22 September 2023, IRMAR, Rennes. Research discussions with Karine Beauchard and Vincent Duchêne.
- 16-23 November 2023, NUAA University, Nanjing, China, Research discussions with Ling-Yun Shou and Jiang Xu.
- 23-24 November 2023, Tongji University, Shanghai, China. Research discussions with Xin Zhang.
- 24-26 January 2024, TU Darmstadt. Research discussions with Jan Giesselmann and Tabea Tscherpel
- 12-14 February 2024, KIT, Karlsruhe. Research discussions with Xian Liao.

Administrative responsibilities

- Co-responsible of the recruitment of master interns at FAU. Interview of PhD and Master applicants.
- Co-responsible of an ANR-DFG international collaborative call: administrative part and drafting of the research proposal.
- Co-organizer of the PhD seminar at Université Paris-Est-Créteil (2018-2021)
- Co-organizer of the DcN-AvH Seminars (2023-2024)

Hobbies

- Hiking
- Badminton & table tennis