Antoine DIEZ
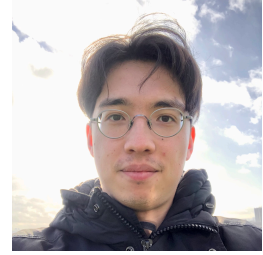
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Born on May 14th, 1994 in Paris, Nationality: French

Since May 2022, I am a **Program Specific Researcher** (post-doc) at the Kyoto University Institute for the Advanced Study of Human Biology **(ASHBi)**. I work in the *Mathematical Biology and Medicine Laboratory* led by Prof. Sungrim Seirin-Lee.

Updated August 2023.

▬▬▬ Curriculum Vitae

2022 – …　**Post-doc**, *Kyoto University ASHBi*, Kyoto, Japan

2018–2022　**PhD student**, *Imperial College London*, London, UK
Under the supervision of Prof. Pierre Degond (Imperial College London), Prof. Sara Merino-Aceituno (University of Vienna) and Dr. Amic Frouvelle (Université Paris-Dauphine).
EPSRC-Roth scholarship co-funded by the Department of Mathematics at Imperial College London and the Engineering and Physical Sciences Research Council.

2017–2018　**Master degree in Mathematics (MSc)**, *École Normale Supérieure*, Lyon, France
French "Master 2" (M2)
First class honours

2016–2017　**"Agrégation de mathématiques"**, *École Normale Supérieure/Université de Rennes 1*, Rennes, France
The French "Agrégation" is a highly selective competitive examination to become teacher in high school and at the university level.
(National) rank 10/305

2015–2016　**Master degree in Mathematics (1st year)**, *École Normale Supérieure/Université de Rennes 1*, Rennes, France
French "Maîtrise" (M1)
○ First class honours (rank 3/56)
○ Two month internship at the University of Cambridge (UK) supervised by Prof. Clément Mouhot.
Title : *Around the Boltzmann-Grad limit*

2014–2016　**Licence of Physics (Bachelor degree)**, *École Normale Supérieure/Université de Rennes 1*, Rennes, France
First class honours

2014–2015 **Licence of Mathematics (Bachelor degree)**, *École Normale Supérieure/Université de Rennes 1*, Rennes, France
  ○ First class honours (rank 2/108)
  ○ Internship at the University Paris-VI supervised by Dr. Corentin Audiard.
    Title : *Asymptotic Solutions of the Quadratic Nonlinear Schrödinger Equation*
2012–2014 **French "classes préparatoires" (MPSI and MP*)**, *Lycée Louis-le-Grand*, Paris, France
  Two years of intensive course in Mathematics and Physics leading to a national competitive examination to be allowed to enrol in one of the French top-level "grandes écoles".
  Recruited (French "normalien", civil servant position) at the École Normale Supérieure de Rennes (ENS).
2009–2012 **High school**, *Lycée Louis-le-Grand*, Paris, France

Invited Talks

Oct. 2023 **International Conference on Recent Developments of Theory and Methods in Mathematical Biology**, *NCTS*, Taipei, Taiwan, Organized by the International Research Network "ReadiNet".
  Poster presentation

Aug. 2023 **ICIAM**, *Waseda University*, Tokyo, Japan
  Talk at the mini-symposium "Mathematics in biological pattern formation: modeling, analysis, and applications"

Jun. 2023 **Summer School - Mean-Field Models**, *Centre Henri Lebesgue, IRMAR*, Rennes, France
  Invited Lecture on "Introduction to Propgation of Chaos and Mean-Field models"

Mar. 2023 **ASHBi Retreat**, *Arima Grand Hotel*, Arima Onsen, Japan

Mar. 2023 **Mathematical Society of Japan Spring Meeting**, *Chuo University*, Tokyo, Japan

Feb. 2023 **Methods and Applications in Mathematical Life Sciences 変革 A: 3G+∞(無限) Fusion Meeting**, *ASHBi*, Kyoto, Japan

Feb. 2023 **「データ記述科学」Henkaku A meeting**, *Institute of Statistical Sciences*, Tokyo, Japan

Dec. 2022 **Kyoto-Vienna biomath workshop**, *Erwin Schrödinger Institute*, Vienna, Austria

Sep. 2022 **JSIAM Annual Meeting**, *Hokkaido University*, Sapporo, Japan

Jun. 2022 **Kyoto University Applied Mathematics Seminar**, *Department of Mathematics*, Kyoto University, Japan

Jun. 2022 **PDE and Numerical Analysis Seminar**, *Laboratoire J.A. Dieudonné*, Nice, France, (online)

Dec. 2021 **Workshop MaMoVi**, *École Polytechnique*, Palaiseau, France

Nov. 2021	**Conference "Asymptotic Behaviors of systems of PDEs arising in physics and biology - 4th edition"**, *Polytech*, Lille, France
Oct. 2021	**Conference "Non-Local Models Arising from Biology"**, *CIRM, Marseille*, France
	Poster presentation
Feb. 2021	**PhD Seminar**, *Laboratoire Jacques-Louis Lions, UPMC*, Paris, France
Mar. 2020	**Workshop of the Royal Society - CNRS international exchange grant 'Segregation models in social sciences'**, *INRIA Paris*, France
Dec. 2019	**CAKE seminar**, *University of Cambridge*, UK
Oct. 2019	**Ki-Net Young Researchers Workshop**, *CSCAMM, University of Maryland*, USA
Nov. 2018	**Workshop of the Royal Society - CNRS international exchange grant 'Segregation models in social sciences'**, *Imperial College London*, UK

Attended conferences (without invited talk)

Dec. 2020	**Online event "Mathematical Methods for the Study of Self-organization in the Biological Sciences"**, *Erwin Schrödinger Institue*, Austria
July 2019	**Conference "Mathematical Frontiers in the Analysis of Many-particle Systems"**, *Cambridge*, UK
	Accommodation provided by the MAFRAN organizers
June 2019	**Workshop "Scaling Limits and Large Deviations at Orléans"**, *Orléans*, France
May 2019	**Summer School "Trails in kinetic theory: foundational aspects and numerical methods"**, *Hausdorff Research Institute for Mathematics, Bonn*, Germany
	Local expenses covered by the HIM
July 2018	**Workshop "Asymptotic approach to spatial and dynamical organizations"**, *Université Paris VI, Paris*, France
May 2016	**Conference "Mathematical Topics in Kinetic Theory"**, *Cambridge*, UK

Research stays

Dec. 2022	**Wolfson Centre for Mathematical Biology**, *University of Oxford*, UK, One-week research stay hosted by the group of Prof. Philip Maini.
Nov. 2022 & Dec. 2022	**Erwin Schrödinger Institute**, *Vienna*, Austria, Two-week research stay during the thematic programme "Mathematical Methods for the Study of Self-organization in the Biological Sciences".
	Funded by the KU-UNIVIE Joint Grant program.

Nov. 2022 & Dec. 2022	**Erwin Schrödinger Institute**, *Vienna*, Austria, Two-week research stay hosted by Prof. Sara Merino-Aceituno during the thematic programme "Mathematical Methods for the Study of Self-organization in the Biological Sciences". Funded by the KU-UNIVIE Joint Grant program.
Feb. 2022 & April 2022	**Institut de mathématiques de Toulouse**, *Toulouse*, France, Research stays hosted by Prof. Pierre Degond
July 2021	**Institut de mathématiques de Toulouse**, *Toulouse*, France, One-week research stay hosted by Prof. Pierre Degond
Oct.-Nov. 2019	**CSCAMM, University of Maryland**, USA, Four-week research stay hosted by Prof. Pierre-Emmanuel Jabin Funded by the Ki-Net network
April 2019	**CEREMADE, Université Paris Dauphine**, *Paris*, France, One-month research stay hosted by Dr. Amic Frouvelle
Dec. 2018	**University of Vienna**, *Vienna*, Austria, One-week research stay, invited by Prof. Sara Merino-Aceituno
April-July 2018	**Université Paris Dauphine (France), Imperial College London (UK) and University of Sussex (UK)**, Four month internship supervised by Prof. Pierre Degond, Prof. Sara Merino-Aceituno and Dr. Amic Frouvelle Master thesis title: *Body-orientation dynamics, particle models, phase transitions and macroscopic models* Partially funded by an Erasmus+ grant of the European Union
May-June 2016	**University of Cambridge**, *Cambridge*, UK, Two-month internship supervised by Prof. Clément Mouhot M1 thesis title: *Around the Boltzmann-Grad limit* Partially funded by an Erasmus+ grant of the European Union
May-June 2015	**Université Paris VI**, *Paris*, France, One-month internship supervised by Dr. Corentin Audiard Bachelor thesis title: *Asymptotic Solutions of the Quadratic Nonlinear Schrödinger Equation*

Awards, fundings and grants

2023 - 2027	**KAKENHI Grant-in-Aid for Early-Career Scientists**, *Mechanical modes of cell migration in fiber networks*, Project Number 23K13015 ¥4,290,000 (Direct Cost: ¥3,300,000、Indirect Cost: ¥990,000)
2022	**KU-UNIVIE Joint Grant Program**, *Cooperation between Kyoto University (KU) and the University of Vienna (UNIVIE) in the framework of their Strategic Partnership established in 2019*, JPY 1,000,000 from July 2022 to early March 2023 Co-organization of an international workshop at the Erwin Shrödinger Institute (Vienna) during the thematic programme "Mathematical Methods for the Study of Self-organization in the Biological Sciences".

2020 **Imperial-CNRS grant on "A Global Approach on Sampling Problems for Imaging (GASPI)"**, *I co-coordinated a French-UK project between mathematicians, statisticians and computer scientists to work on medical imaging problems. This project was awarded an Imperial-CNRS grant (£7,000) for one year*, Due to the COVID-19 outbreak, the project had unfortunately to be cancelled

2018 **PhD scholarship**, *EPSRC-Roth scholarship co-funded by the Department of Mathematics at Imperial College London and the Engineering and Physical Sciences Research Council*

2018 **Erasmus+ grant of the European Union**, *Partial funding for an internship at Imperial College London and the University of Sussex (UK)*

2017 **French "Agrégation de Mathématiques"**

2016 **Erasmus+ grant of the European Union**, *Partial funding for an internship at the University of Cambridge (UK)*

2014 **Received "Normalien" at the École Normale Supérieure de Rennes**, *Four-year studies fully funded (equivalent to a scholarship) by the French state (civil servant position)*

Teaching and supervision

May-July **Supervision**, *AHSBi*, Kyoto, Japan
2023 Co-supervision of the Master internship of a student from ENS Rennes (France).

2018-2020 **Supervision**, *Imperial College London*, London, UK
Co-supervision of 5 MSc projects (2 from outside Imperial), main supervisor: Pierre Degond

2019-2020 **Graduate Teaching Assistant**, *Imperial College London*, London, UK, Nonlinear Waves (2nd year), Function spaces and applications (3rd and 4th years), Advanced topics in Partial Differential Equations (3rd and 4th years)
Demonstration (exercice class), Coursework marking

2018-2019 **Graduate Teaching Assistant**, *Imperial College London*, London, UK, Analysis I and II (1st and 2nd years)
Demonstration (exercice class), Coursework marking.

2017-2018 **"Khôlleur"**, *Lycée du Parc*, Lyon, France
Weekly oral examination in French "classe préparatoire" (MP, 2nd year)

2016-2017 **"Khôlleur"**, *Lycée Chateaubriand*, Rennes, France
Weekly oral examination in French "classe préparatoire" (MP, 2nd year)

Miscellanous

Programming skills: Python, Julia, MATLAB
Language: French, English

Publications and preprints

[12] P. Degond and A. Diez. "Topological travelling waves of a macroscopic swarmalator model in confined geometries". *arXiv preprint arXiv:2307.14738* (2023).

[11] A. Diez[†], A. Krause, P. Maini, E. Gaffney, and S. Seirin-Lee. "Turing pattern formation in reaction-cross-diffusion systems with a bilayer geometry". *bioRxiv preprint doi:10.1101/2023.05.30.542795* (2023).

[10] M. Briant, A. Diez, and S. Merino-Aceituno. "Cauchy theory for general Vicsek models in collective dynamics and mean-field limit approximations". *SIAM J. Math. Anal.* 54.1 (2022).

[9] L.-P. Chaintron and A. Diez. "Propagation of chaos: a review of models, methods and applications. I. Models and Methods". *Kinet. Relat. Models* 15.6 (2022), pp. 895–1015.

[8] L.-P. Chaintron and A. Diez. "Propagation of chaos: a review of models, methods and applications. II. Applications". *To appear in Kinet. Relat. Models* 15.6 (2022), pp. 1017–1173.

[7] G. Clarté, A. Diez, and J. Feydy. "Collective Proposal Distributions for Nonlinear MCMC samplers: Mean-Field Theory and Fast Implementation". *Electron. J. Statist.* 16.2 (2022), pp. 6395–6460.

[6] P. Degond, A. Diez, and M. Na. "Bulk topological states in a new collective dynamics model". *SIAM J. Appl. Dyn. Syst.* 21.2 (2022).

[5] P. Degond, A. Diez, and A. Walczak. "Topological states and continuum model for swarmalators without force reciprocity". *Anal. Appl. (Singap.)* 20.6 (2022), pp. 1215–1270.

[4] P. Degond, A. Diez, and A. Frouvelle. "Body-attitude coordination in arbitrary dimension". *arXiv preprint arXiv:2111.05614* (2021).

[3] A. Diez. "'SiSyPHE': A Python package for the Simulation of Systems of interacting mean-field Particles with High Efficiency". *Journal of Open Source Software* 6.65 (2021), p. 3653. URL: https://sisyphe.readthedocs.io/.

[2] P. Degond, A. Diez, A. Frouvelle, and S. Merino-Aceituno. "Phase transitions and macroscopic limits in a BGK model of body-attitude coordination". *J. Nonlinear Sci.* 30 (2020), pp. 2671–2736.

[1] A. Diez. "Propagation of chaos and moderate interaction for a piecewise deterministic system of geometrically enriched particles". *Electron. J. Probab.* 25 (2020).

All the author lists are sorted in alphabetical order except when indicated by †.