CURRICULUM VITAE: ALEXANDRE LANAR (BORITCHEV)

Personal Information

Name: Alexandre Lanar (birth name Boritchev)

Date of birth: 10/01/1986

Place of birth: Saint Petersburg, Russia

Nationality: French

Languages: French (native-level); English, Russian (fluent); Italian (intermediate).

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Institut Camille Jordan
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Studies and work situation

- September 2014-: Maître de conférences (tenured assistant professor), Institut Camille Jordan, Université Lyon 1.
- July-December 2020: Sabbatical (CRCT).
- July-December 2018: Sabbatical (Délégation CNRS).
- July 2013-August 2014: Post-doctoral position at the University of Geneva with J.-P.Eckmann (ERC BRIDGES).
- September 2012-June 2013: Post-doctoral visits to Trieste, Milan, Cergy-Pontoise and Rennes.
- September 2009-October 2012: Ph.D. under the direction of Sergei Kuksin, Centre de Mathématiques Laurent Schwartz, Ecole Polytechnique. Subject: "Generalised Burgers equation with random force and small viscosity". Thesis defended on October 8, 2012.
- 2008-2009: Master "Analysis, Arithmetics and Geometry" (Ecole Polytechnique-Ecole Normale Supérieure-University Paris 11).
- 2005-2008: Ecole Polytechnique (Paris).

Publications

Book:

- *One-dimensional turbulence and the stochastic Burgers equation* (with S. Kuksin), Mathematical Surveys and Monographs vol. 255, AMS.

Articles:

- *Sharp well-posedness and blowup results for parabolic systems of the Keller-Segel type* (with P.Biler and L.Brandolese), accepted to Methods and Applications of Analysis, http://arxiv.org/abs/2206.10399

- *Large global solutions of the parabolic-parabolic Keller-Segel system in higher dimensions* (with P.Biler and L.Brandolese), Journal of Differential Equations, 2023, 344: 891-914. http://arxiv.org/abs/2203.09130

- *Sharp Sobolev estimates for solutions to an aggregation-diffusion equation* (with P.Biler, G.Karch and P.Laurençot), Journal of Dynamics and Differential Equations, 2022, 34: 3131–3141, http://arxiv.org/abs/2009.12173

- *Intermittency of Riemann's non-differentiable function through the fourth-order flatness* (with D.Eceizabarrena and V.Vilaça da Rocha), Journal of Mathematical Physics, 2021, 62: 093101, http://arxiv.org/abs/1910.13191

- *Concentration phenomena in a diffusive aggregation model.* (with P.Biler, G.Karch and P.Laurençot), Journal of Differential Equations, 2021, 271: 1092-1108, http://arxiv.org/abs/2001.06218

- *Exponential convergence to the stationary measure for a class of 1D Lagrangian systems with random forcing*, Stochastic and Partial Differential Equations: Analysis and Computation, 2018, 6: 109-123, http://arxiv.org/abs/1601.01937

- *Decaying turbulence for the fractional subcritical Burgers equation*, Discrete and Continuous Dynamical Systems A, 2018, 38(5): 2229-2249,

http://arxiv.org/abs/1608.01460

- *Multidimensional potential Burgers turbulence*,
  Communications in Mathematical Physics, 2016, 342: 441 with an erratum: (2016) 344: 369,
  http://arxiv.org/abs/1312.6971

- *Turbulence for the generalised Burgers equation*
  Russian Mathematical Surveys, 69:6 (2014), 957-994, http://arxiv.org/abs/1304.6814

- *Note on Turbulence in a Generalised Burgers Equation*,
  Archive for Rational Mechanics and Analysis, 214 (2014), 1, 331-357, http://arxiv.org/abs/1208.5241

- *Sharp Estimates for Turbulence in White-Forced Generalised Burgers Equation*,
  Geometric and Functional Analysis, 23 (2013), 6, 1730-1771, http://arxiv.org/abs/1201.5567

- *On Hyperbolicity of Minimizers for 1D Random Lagrangian systems* (with K.Khanin),
  Nonlinearity, 26, 1 (2013), 65-80, http://arxiv.org/abs/1203.4990

- *Estimates for Solutions of a Low-Viscosity Kick-Forced Generalised Burgers Equation*, Proceedings of the Royal Society of Edinburgh A, 143(2), 2013, 253-268, http://arxiv.org/abs/1107.4866

Proceedings:

- *1D Burgers Turbulence: a model case for the Kolmogorov theory* (in French), Laurent Schwartz seminar - PDE and applications (2011-2012), Exp. No. 40, 13 p.
- *Exponential convergence to the stationary measure and hyperbolicity of the minimisers for random Lagrangian systems*, Proceedings Equadiff 2017 Bratislava, pp. 117-126.

Teaching experience

- 2024-2025: University Lyon 1.
  Lectures and exercice sessions for 2nd year undergraduate students: Analysis.
  Lectures for 2nd year master students (including ENS Lyon): Introduction to PDEs (in English).
- 2023-2024: University Lyon 1.
  Exercice sessions for 1st year undergraduate students: Algebra and Analysis.
  Exercice sessions for 2nd year undergraduate students: Analysis, Statistics.
  Exercice sessions for 3rd year undergraduate students: Probability.
  Lectures for 2nd year master students (including ENS Lyon): Introduction to PDEs (in English).
- 2022-2023: University Lyon 1.
  Exercice sessions for 1st year undergraduate students: Algebra and Analysis.
  Exercice sessions for 2nd year undergraduate students: Analysis.
  Exercice sessions for 3rd year undergraduate students: Calculus of Variations; Probability.
- 2022: Examiner for orals at ENS Lyon.
- 2021-2022: University Lyon 1.
  Exercice sessions for 1st year undergraduate students: Analysis.
  Exercice sessions for 2nd year undergraduate students: Analysis.
  Exercice sessions for 3rd year undergraduate students: Complex Analysis and Differential Calculus.
  Lectures and exercice sessions for 2nd year master students (including ENS Lyon): Stochastic PDEs (in English).
- 2020-2021: University Lyon 1 (one semester because of sabbatical).
  Exercice sessions for 1st year undergraduate students: Analysis.
  Exercice sessions for 3rd year undergraduate students: Complex Analysis and Differential Calculus.
  Lectures and exercice sessions for 2nd year master students (including ENS Lyon): Stochastic PDEs (in English).
- 2019-2020: University Lyon 1.
  Exercice sessions for 1st year undergraduate students: Algebra and Analysis.
  Exercice sessions for 2nd year undergraduate students: Statistics.
  Exercice sessions for 3rd year undergraduate students: Probability.
  Lectures and exercice sessions for 1st year master students: Analysis and PDEs.
- 2018-2019: University Lyon 1 (one semester because of sabbatical).
  Exercice sessions for 1st year undergraduate students: Algebra and Analysis.
  Exercice sessions for 3rd year undergraduate students: Probability.
  Lectures and exercice sessions for 1st year master students: Analysis and PDEs.

- 2017-2018: University Lyon 1.
  Exercice sessions for 1st year undergraduate students: Algebra and Analysis.
  Exercice sessions for 2nd year undergraduate students: Algebra and Analysis.
  Exercice sessions for 3rd year undergraduate students: Differential Calculus, Complex Analysis and Probability.
  Lectures and exercice sessions for 1st year master students: Analysis and PDEs.
- 2016-2017: University Lyon 1.
  Exercice sessions for 1st year undergraduate students: Algebra and Analysis.
  Exercice sessions for 3rd year undergraduate students: Differential Calculus, Complex Analysis.
  Exercice sessions for 1st year master students: Analysis and PDEs.
- 2015-2016: University Lyon 1.
  Exercice sessions for 1st year undergraduate students: Algebra and Analysis.
  Exercice sessions for 3rd year undergraduate students: ODEs, PDEs and Probability, Statistics.
  Exercice sessions for 1st year master students: Analysis and PDEs.
- 2014-2015: University Lyon 1.
  Exercice sessions for 1st and 2nd year undergraduate students: Algebra and Analysis.
  Exercice sessions for 3rd year undergraduate students: ODEs, PDEs and Probability, Statistics.
- 2013-2014: Exercice sessions for 3rd year undergraduate students at the University of Geneva. 1st semester: Statistical Physics.
- 2011-2012: Lectures and exercice sessions for 2nd year undergraduate students at IUT de Cachan (University Paris 11). 1st semester: Probability Theory. 2nd semester: Fourier Series and Fourier Transform.
- 2010-2011: Lectures and exercice sessions for 2nd year undergraduate students at IUT de Cachan (University Paris 11). 2nd semester: Fourier Series and Fourier Transform.
- 2009-2010: Oral examinations training sessions ("Colles") for undergraduate students in mathematics at the Classe Preparatoire of Lycée Blaise Pascal (Orsay).

Organisation and administration

- 2022: Organisation of mini-symposium in memory of Geneviève Raugel: Fluid mechanics and Dynamical Systems, XVth Franco-Romanian Applied Mathematics Conference, Toulouse.
- 2022: Organisation of a mini-workshop on Turbulence and Intermittency, Lyon.
- 2020-2022: Founder and organiser of the "Young people in analysis and modeling in Lyon" working group.
- 2019-2022: Organiser of the Lyon Applied Math Seminar.
- 2016: President of the jury for the baccalauréat (French high-school diploma equivalent to the A-Levels), Lycée Robert Doisneau, Vaulx-en-Velin.
- 2015-: Member of the library comittee, Institut Camille Jordan, University Lyon 1.
- 2011-2012: Organiser of the Ph.D. students seminar at CMLS, Ecole Polytechnique.

Supervision

- 2021: Internship of Pierre-Marie Desbouchages (3rd year of undergraduate studies, ENS Rennes, 6 weeks): Conservation laws, entropy solutions and inviscid limit.
- 2021: Internship of Bastien Cavarretta (Master 1, ENS Cachan, 14 weeks): An example of a fractional aggregation-diffusion type PDE.

Participation in committees

- 2024: Master 2 thesis committee of Benjamin Capdeville, Guillaume Soenen and Charlotte Tonnelier, Ecole Normale Supérieure de Lyon.
- 2023: Master 2 thesis committee of Pierre Gonin-Joubert and Maëlle Labeille, Ecole Normale Supérieure de Lyon.
- 2019: Ph.D. thesis committee of Sofiane Martel, Ecole des Ponts et Chaussées.

Editorial responsibilities

- Referee for: Acta Applicandae Mathematicae, Arnold Mathematical Journal, Communications in Mathematical Physics (twice), Discrete and Continuous Dynamical Systems A, Journal of the American Mathematical Society (preliminary report), Journal of Evolution Equations (twice), Journal of Theoretical Probability, Stochastic Processes and Applications (preliminary report), SPDEs: Analysis and Computation (twice).
- 2013-2014: Mathscinet reviewer.

Outreach

- Frequent interviews about my work with middle school interns at Institut Camille Jordan.
- 2020: Two-hour interview for the mathematical journal of the ENS Lyon students (link in French), `https://jmeenslyon.files.wordpress.com/2021/05/pratique_de_la_recherche-2.pdf`
- 2017: Participation in the "Maths à Lyon" mobile exhibition for schoolchildren, Middle school Jean Perrin, Lyon.
- 2014-2018: Participation in the press review team for the blog "Images des mathématiques".

Scientific Visits

- May 2023: Visit to the university of Wroclaw for a collaboration with P.Biler, G.Karch and K.Krawczyk (1 week).
- September-December 2021: Visit to Lyon by P.Biler, Wroclaw (4 months; visiting professor at the Lyon Collegium).
- November 2019: Visit to Lyon by P.Biler and G.Karch, Wroclaw (1 week).
- October 2019: Visit to the university of Wroclaw for a collaboration with P.Biler and G.Karch (1 week).
- April 2019: Visit to the university of Paris 6 for a collaboration with V.Banica, D.Eceizabarrena and V.Vilaça da Rocha (3 days).
- February 2019: Visit to Lyon by D.Eceizabarrena, Bilbao (1 week).
- November 2018: Visit to the university of Paris 6 for a collaboration with V.Banica (3 days).
- November 2018: Visit to Lyon by P.Biler and G.Karch, Wroclaw (1 week).
- October 2018: Visit to the university of Jinan for a collaboration with S.Kuksin (2 weeks).
- September 2018: Visit to the university of Wroclaw for a collaboration with P.Biler and G.Karch (1 week).
- May 2017: Visit to the University of Wroclaw for a collaboration with P.Biler and G.Karch (1 week).
- April 2017: Visit to the University of Rome 1 for a collaboration with M.Mariani (1 week).
- October 2016: Visit to the University of Toronto for a collaboration with K.Khanin and K.Zhang (2 weeks).
- Avril 2016: Visit to Lyon by M.Mariani, Rome 1 (1 week).
- October 2015: Visit to the University of Rome 1 for a collaboration with A.Davini and M.Mariani (1 week).
- October 2010: Visit to the University of Toronto for a collaboration with K.Khanin (1 month).

Talks at seminars

- 2024 *Seminars at Evry, Lyon (3 times), Saint-Petersburg (online)*
- 2023 *Seminars at Orsay, Wroclaw*
- 2022 *Seminars at Besançon, Créteil, Lyon (online), Reims, Versailles*
- 2021 *Seminars at Besançon, Lyon*
- 2020 *Seminars at Grenoble, Lille (online)*
- 2019 *Seminars at Lyon, Montpellier, Wroclaw*
- 2018 *Seminars at Beijing (2 times), Düsseldorf, Jinan, Nice, Pau, Tours*
- 2017 *Seminars at Besançon, College Park (University of Maryland), Lisbon, Paris (IHP), Wroclaw*
- 2016 *Seminars at Bordeaux, Cergy-Pontoise (2 times), Geneva, Hamilton, Leipzig, Montréal*
- 2015 *Seminars at Rome (2 times), Toulouse*
- 2014 *Seminars at Evry, Lyon (2 times), Nice, Paris Dauphine, Paris 11, Paris 13*
- 2013 *Ph.D. students seminars at Cergy-Pontoise, Rennes; Seminars at Cergy-Pontoise, Geneva, Grenoble, Helsinki, Lyon, Marseille, Nice, Oxford, Paris (IHP) (2 times)*
- 2012 *Ph.D. students seminars at Cambridge, Ecole de Ponts et Chaussées, Ecole Polytechnique; Seminars at IHES, Geneva, Milan (2 times), Nice*
- 2010 *Ph.D. students seminar at Ecole Polytechnique (2 times)*

Talks at conferences

- 2024, Hangzhou, Chine
  BIRS Conference: Nonlocal Problems in Mathematical Physics, Analysis and Geometry.(on line)
- 2024, Ecully, France
  MMCS group internal meeting, INSA Lyon
- 2024, Marseille
  Aggregation-Diffusion Equations and Collective Behavior: Analysis, Numerics and Applications, CIRM
- 2023, Warsaw, Poland
  Conference: Diffusion Equations and their applications.
- 2022, Toulon, France
  Meeting of the ANR NONSTOPS grant: Beyond Gibbsianity.
- 2019, Marseilles, France
  PDE/Probability Interactions: Particle Systems, Hyperbolic Conservation Laws, CIRM.
  Video: https://www.youtube.com/watch?v=EMKLESEKBek.
- 2018, Pontoise, France
  Conference: Random and Dispersive Waves.
- 2018, Bielefeld, Germany
  ICSAA conference: "Stochastic analysis and its applications".

- 2017, Bratislava, Slovakia
  Equadiff 2017, Minisymposium: Stochastic PDEs.
- 2017, Edimbourg, United Kingdom
  Conference: "Probabilistic perspectives in nonlinear PDEs".
- 2017, Bedlewo, Poland
  Conference: "Stochastic analysis and applications".
- 2017, Bures-sur-Yvette, France
  Meeting of the ANR ISDEEC grant, IHES
- 2017, Bordeaux, France
  Conference "Beyond Hamilton-Jacobi, last call for Bordeaux"
- 2016, Ecully, France
  MMCS group internal meeting, Ecole Centrale Lyon
- 2016, Montréal, Canada
  Conference "Probabilistic Methods in Dynamical Systems and Applications"
- 2016, Shanghai, China
  Workshop on Hamiltonian Dynamical Systems
- 2016, Levico, Italy
  Conference: Stochastic Partial Differential Equations and Applications
- 2014, Ecully, France
  PDE Meeting Rhône-Alpes-Auvergne, Ecole Centrale Lyon
- 2012, Oxford, United Kingdom
  International Conference on Nonlinear PDEs, University of Oxford
- 2012, Oberwolfach, Germany
  Workshop: Mathematical aspects of hydrodynamics
- 2012, Palaiseau, France
  Analysis and PDE research group internal meeting, CMLS, Ecole Polytechnique
- 2012, Edinburgh, United Kingdom
  Conference: Dynamics in infinite dimensions: ergodic theory and PDE
- 2012, Pontoise, France
  Conference: Stochastic systems in mathematics and mathematical physics
- 2011, Peyresq, France
  Summer school: Nonlinear Dynamics and Localised Structures

Funding

- 2018-2019: P.I. of the Franco-Polish PHC Polonium Grant (4 participants in Lyon, Toulouse and Wroclaw): Nonlocal and Nonlinear Problems in Biology and Astronomy.
- 2018-2021: Member of the French ANR grant NONSTOPS: Nonequilibrium stochastic and open systems.
- 2017: Research funds PEPS: grant for young assistant professors.
- 2017-2020: Recipient of the PEDR (Research and Doctoral Mentoring Bonus).
- 2017-2020: Member of the French ANR grant ISDEEC: Interactions between dynamical systems, evolution equations and control.
- 2015: Research funds from the University Lyon 1.
- 2012-2016: Member of the French ANR grant WKBHJ: Weak KAM beyond Hamilton-Jacobi.