Curriculum Vitæ

on 18th October 2024

Civil status

PEYRE Rémi, Jean-Marc (male)

French citizen

Born on 1985-12-02 in Brive-la-Gaillarde (France)

Single, no child

Personal details

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Current situation

"Maitre de conférences" (≈ associate professor) at Univeristy of Lorraine (Nancy, France): research at *Institut Élie Cartan de Lorraine*; teaching at the school of engineering *École des Mines de Nancy*.

Curriculum

1991 – 2002: Pupil in some schools of Brive-la-Gaillarde, France. In 2002, got "baccalauréat série S" (≈ A-level, specialised in science) at G. Cabanis high school [with highest honours and jury's congratulations].

2002 – 04: "Classes préparatoires PCSI – PC*" (intensive course focused on physics and chemistry) in Pierre de Fermat Institute (Toulouse, France). In 2004, got admission at *École Normale Supérieure* [PC 2004 exam, rank 1], and got a formal diploma (120 ECTS level) in physics & chemistry from University of Toulouse III.

2004 – 07: Course "Fundamental Mathematics and Applications to Computer Science" at *École Normale Supérieure*. In 2007, got the corresponding diploma [with highest honours], with a memoir on *Large number of interacting particles: Fourier law and mean field Boltzmann's equation*; also got a formal diploma (300 ETCS) in mathematics from University Paris-Sud (speciality "Probability theory & statistics", variant "Probability") [highest honours].

2007 – 11: PhD in mathematics at *École Normale Supérieure de Lyon* (Lyon, France), advisor: Cédric Villani. The thesis' title was "Some questions in probability theory viewed with a physical twist", defended in November 2010 [with highest honours].

[*] On the left-hand side, research laboratory; on the right-hand side, teaching department.

2011 – : "Maitre de conférences" (≈ associate professor) at Univeristy of Lorraine (Nancy, France): research at *Institut Élie Cartan de Lorraine*; teaching at the school of engineering *École des Mines de Nancy*.

2011 – 16: Holding a chair co-funded by CNRS (French main public research institute).

2016-17: (Year off University of Lorraine). Postdoctoral researcher at University of Vienna (Austria), collaborator of Pr. Walter Schachermayer.

2018 – 20: Part-time work (2018-19: 50 %; 2019-20: 70 %).

Autumn 2020: 6-month period as full-time researcher (paid by CNRS).

2021 – 25: Part-time work (resp. 80 %, 50 %, 70 %, 80 % for the four consecutive years).

Scientific publications

Published or accepted articles

1. R. Peyre – A probabilistic approach to Carne's bound. *Potential Analysis* 29 (2008), # 1, pp. 17 – 36.
2. R. Peyre – Some ideas about quantitative convergence of collision models to their mean field limit. *Journal of Statistical Physics* 136 (2009), # 6, pp. 1105 – 1130.
3. R. Peyre – Quelques problèmes d'inspiration physique en théorie des probabilités. Thèse de doctorat, École Normale Supérieure de Lyon (2010).
4. R. Peyre – Sharp equivalence between ρ- and τ-mixing coefficients. *Studia Mathematica* 216 (2013), # 3, pp. 245 – 270.
5. R. Peyre – Fractional Brownian motion satisfies two-way crossing. *Bernoulli* 23 (2017), # 4B, pp. 3571 – 3597.
6. R. Peyre – Comparison between W_2 distance and $\dot{\mathrm{H}}^{-1}$ norm, and Localization of Wasserstein distance. *ESAIM: COCV* 24 (2018), # 4, pp. 1489 – 1501.
7. C. Czichowsky, R. Peyre, W. Schachermayer & J. Yang – Shadow prices, fractional Brownian motion, and portfolio optimisation under transaction costs. *Finance and Stochastics* 22 (2018), # 1, pp. 161 – 180.

Submitted papers and pre-publications

8. R. Peyre – Tensorizing maximal decorrelations. arXiv:1004.1602v2, 128 pp. To be submitted soon.

Noticeable contributions to others' research work

1. L. N. Hoang – Strategy-proofness of the randomized Condorcet voting system. 48-3 (2017), pp. 679 – 701.
2. P. Berger & J. Bochi – On emergence and complexity of ergodic decompositions. *Advances in Mathematics* 390-107904 (2021), 52 pp.

Invited speaker

Conferences

- Conference in honour of Cédric Villani, 24th November 2010, Lyon, France. (*Boltzmann: from discrete to continuous models*).

- Rhône-Alpes – Auvergne PDE days, 25th November 2010, Lyon, France. (*McKean–Vlasov buckling*).
- 92nd meeting between mathematicians and theoretical physicists, 26 September 2013, Strasbourg, France. (*Free energy functional in an optimal transportation setting*).
- Workshop on fractional Brownian motion and rough models, 8th June 2017, Barcelona, Spain (*Two-way crossing property for fBm*).
- Freibug-Wien-Zürich Workshop, 4th July 2018, Wolfgangsee, Austria. (*Where stochastic processes, fractal dimensions, numerical computations and quasi-stationary distributions meet*).

Selected talks in seminars

- Oct. 2008: University of Oxford (United Kingdom), Stochastic Analysis Seminar Series.
- Dec. 2009: University of Geneva (Switzerland), Seminar of physical mathematics.
- Feb. 2011: University of Cambridge (United Kingdom), Seminar of probability theory.
- Nov. 2015: ETH Zürich (Switzerland), ITS seminar on mathematical finance.
- Nov. 2016: Vienna University (Austria), Vienna Seminar in Mathematical Finance and Probability. (*Fractional Brownian motion, financial mathematics and stopping times*).
- Mar. 2017: Imperial College London (United Kingdom), Finance and Stochastics seminar. (*The amazing trading of fractional Brownian motion*).
- Feb. 2024: Calais (France), EMA team seminar. (*Random convex polytopes of* $\mathbb{R}^d$).
- Feb. 2024: Lille (France), Workshop on point processes & applications. (*Extreme voids for a Poisson point process*).

Teaching (since 2017)

- Lecturer “Monte Carlo methods” [4th year], 2018, 2020–2022, [teaching assistant in 2024], 2025– .
- Lecturer “Statistical inference” [3rd year], 2017–2025.
- Lecturer “Mathematical upgrading” [4th year], 2024– .
- Teaching assistant “Data analysis” [4th year]: 2017.
- Lecturer “Topics in information theory” [5th year]: 2017–2023.
- Teaching assistant “Time series” [4th year]: 2017.
- Teaching assistant “Introduction to machine learning” [4th year]: 2017.
- Supervising 4th year level school projects: “Simplied single Transferable Vote” (2017), “Devicing a Yahtzee-playing software” (2022).
- Supervising 5th year school projects: “Large deviations” (2011), “Fractional Brownian motion for financial processes” (2014), Numerical computation of optimal transportation distances (2015). Optimal trading in presence of transaction costs (2018), Electoral fraud? (2020), Portfolio theory (2023), Analysis and explanation of market impact (2024)
- Tutorial supervision of 3rd year students, of “engineer” final internships, of students studying temporarily outside the school.

Student internships

- Yassine Boucharef: 3rd-year internship on "Introduction to electoral theory" (2012).
- Asmae Aqil: 4th-year research project on "Quasi-stationary distributions and Fleming-Viot process" (2019).
- Mai-Linh Tran Cong: 2nd-year research project "On construction of Appolinian squares" (2021).

Administrative responsibilities (since 2017)

- Elected member of the Council of IECL lab (2022–2023).
- Member of the human ressources commission at IECL (2018–2023).
- Member of the working group on voting methods for internal elections at IECL (2024–).
- Working groups at Mines Nancy: Evolution of pedagogy; Attractiveness of the school; Adapting to the new high school syllabus.
- Oral examinations in mathematics for the admission at Mines Nancy of students coming from university curricula (2019–24).

Popularisation and para-mathematical activities

- Writer and reviewer on the mathematical popularisation website "Images des Mathématiques". Published articles:
  - Trilogy "The mathematics of democracy" [in French]
    - I Democracy, a subject for mathematical analysis (2012)
    - II And the winner of the run-off vote is… (2012)
    - III The quest for the electoral Grail (2013)
- Plenary speaker at the 2014 Lorraine regional day of the Association of Mathematic Teachers in Public Education.
- Talk at a public event hosted by the French Academy of Sciences on Condorcet. (*Mathematics to improve democracy*).

Awards

Mathematics competitions

- Limousin Mathematics Tournament 1998, 8th grade: special jury's award.
- Limousin Mathematics Tournament 2021, 11th grade: jury's first prize (team with Olivier Boulaud).
- French Championship of Mathematical Games 2024 (open category): national champion.

Miscellaneous abilities

- Fluent written and oral English; intermediate German.
- Advanced LaTeX skills; programming in C/C++, Matlab/Scilab, *R*, Python; HTML programming; Unix/Linux systems user.
- Driving license.