

David Métivier — Curriculum Vitae

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📄 David Métivier • 🌐 dmetivie

Birth 1991, Les Lilas (93) - France • Family Married, 2 children (2020, 2022)

Positions

Chargé de Recherche (Research Scientist)

INRAe – MISTEA Probability & Statistics team

Statistical learning applied to environmental problems

Montpellier

2022–Now

Postdoc

Postdoctorant Chaire Énergies durables X-EDF

École Polytechnique – Centre de Mathématiques Appliquées

Résilience au changement climatique du système de production d'énergies nucléaire et renouvelables

Palaiseau

2020–2022

CNLS Postdoctoral Research Associate

Los Alamos National Laboratory – Theoretical Division “Physics of Condensed Matter and Complex Systems” 2017–2020

Statistical Physics for Uncertain Electrical Power Systems

Los Alamos NM - USA

Education

Physics Ph.D. advised by Julien Barré

Laboratoire J.A. Dieudonné – Université Côte d'Azur

Kinetic models, from Kuramoto to Vlasov: bifurcations and experimental analysis of a Magneto-Optical Trap

Nice

2014–2017

Physics LICENCE & MASTER

École Normale Supérieure de Lyon

Parcours Sciences de la matière (Theoretical physics)

Lyon

2011–2014

Classe préparatoire aux grandes écoles

Lycée Chaptal

Paris

2009–2011

Internships

M2 internship advised by Julien Barré

Laboratoire J.A. Dieudonné – Université Côte d'Azur

The Vlasov-Fokker-Planck equation

Nice

2014 (4 months)

M1 internship advised by Michael Kastner

National Institute for Theoretical Physics

Velocity of a perturbation in an infinite lattice

Stellenbosch - South Africa

2013 (3 months)

L3 internship advised by Alexandre Aubry

Institut Langevin (Ondes et Images) – ESPCI

Ultrasound propagation in heterogeneous media

Paris

2012 (2 months)

Teaching

Academic

École Polytechnique

63h/year

Palaiseau

2020–2022

○ Course instructor + Tutorials: MAA204 Introduction to Statistics Bachelor 2nd year students

○ Tutorials: MAP530 Probability Refresher Master X/HEC, M1/3A Cycle Ingénieur students

○ Tutorials: MAP361 Aléatoire 1A Cycle Ingénieur students

Invited Lecture

Winter School Spectral Methods for Complex Systems
2h

Online
2019

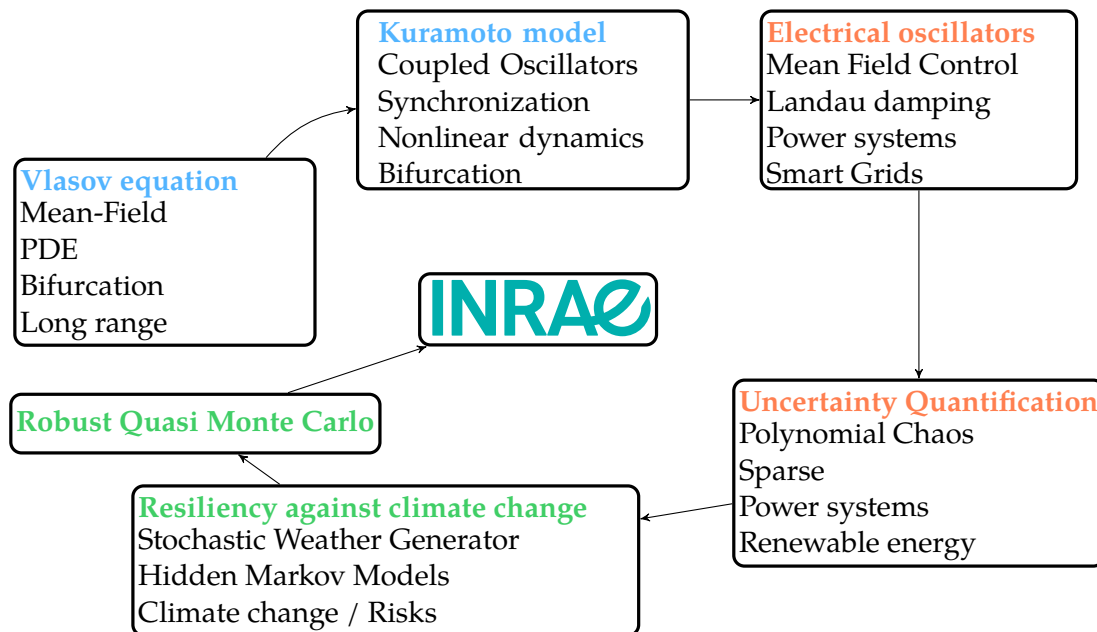
Mentoring

Co-Mentor of Ph.D. student Ilia Luchnikov
Los Alamos National Laboratory
Disorder in Thermostatic Controlled Loads

Los Alamos NM - USA
Summer 2018

Research Interests

Ph.D. Laboratoire J.A. Dieudonné



Post-Doc Centre de Mathématiques Appliquées

KEYWORDS Flowchart of my research keywords

Responsibilities

Organizing

Organizer
Los Alamos National Laboratory
Weekly Post-Doc/Student seminar at Center for Nonlinear Studies

Los Alamos NM - USA
2018–2019

Reviewing

- Europhysics Letters
- Journal of Statistical Mechanics
- Institute of Electrical and Electronics Engineers (IEEE)
- Journal of Physics A: Mathematical and Theoretical
- Electric Power Systems Research
- IEEE Control Systems Letters

Examiner

○ Oral examiner for the Polytechnique Bachelor program entrance

2020–2022

Science popularization

Paroles de Chercheuses et de Chercheurs
Lycée Renoir

Bondy
2021

Discussion in front of three class of high school about research, researchers and my work

Ma Thèse en 180s

University Côte d'Azur edition

Audience prize and 2nd jury's prize at the 3-minutes thesis popularization contest

Nice

2016

Fête de la science

University Côte d'Azur edition

Science activities with middle schoolers

Nice

2015

Computer skills

- Julia
- Mathematica
- Python
- L^AT_EX, HTML, Markdown
- C
- Parallel computing (distributed, GPU)
- Matlab

After Ph.D. Talks

- **Oct. 22** Séminaire SEMSTAT at INRAe/IMAG, *Talk* Montpellier
- **May 22** Séminaire MISTEA at INRAe, *Talk* Montpellier
- **Mar. 22** Séminaire DATA at LJK, *Talk* Grenoble
- **Mar. 22** Workshop Nouveaux challenge en apprentissage statistiques *Short Talk* Font Romeu
- **Feb. 22** Séminaire Géostatistique at MINES ParisTech, *Talk* Fontainebleau
- **Feb. 22** Séminaire GT Mathématiques financières, probabilités numériques at LPSM, *Talk* Paris
- **Jan. 22** Séminaire at Laboratoire des Sciences du Climat et de l'Environnement, *Talk* Saint-Aubin
- **Jan. 22** Weather extremes and Climate Change, *Short talk* IHP
- **Sep. 21** Les XVe Journées de Géostatistique, *Talk* Fontainebleau
- **Mar. 21** Séminaire Analyse Numérique et Équations aux Dérivées Partielles du LMO, *webinar* Orsay
- **Dec. 20** Séminaire Dynamique Quantique et Classique du CPT, *webinar* Marseille
- **Nov. 20** Virtual Informal Systems Seminar at McGill, *webinar* Montréal
- **Nov. 20** Magneto-Fluid Dynamics MFD division at the Courant Institute, *webinar* New York
- **Jul. 20** XXI Power Systems Computation Conference PSCC, *webinar* Porto
- **Jun. 20** Tokamak Disruption Simulation SciDAC *webinar* series
- **Jun. 20** BLABS Theoretical Division seminar, *webinar* Los Alamos NM
- **May 20** Conference Arizona - Los Alamos Days, *webinar* Tucson AZ
- **Mar. 20** Seminar at Laboratoire Matière et Systèmes Complexes, *webinar* Paris
- **Dec. 19** Seminar at R&D of Réseau de Transport d'Électricité, La Défense
- **Dec. 19** Seminar at Laboratoire de Physique, École Normale Supérieure de Lyon
- **Dec. 19** Seminar at Laboratoire de Physique Théorique et Modélisation, Cergy-Pontoise
- **Dec. 19** Conference PGMO days, Optimization of energy session, EDF/Lab Palaiseau
- **July 19** Conference StatPhys 27, Nonlinear physics session, Buenos Aires

- **May 19** External Advisory Committee and Review of the CNLS, Los Alamos NM
- **Apr. 19** Conference Arizona - Los Alamos Days, Tucson AZ
- **Apr. 19** Postdoc Seminar CNLS, Los Alamos NM
- **Mar. 19** Seminar at School of Mathematical and Statistical Sciences, Phoenix AZ
- **Oct. 18** Seminar at Institute for Physical Science and Technology, College Park MD
- **May. 18** Workshop on Long-range Interactions and Synchronization, São Paulo
- **Apr. 18** Postdoc Seminar CNLS, Los Alamos NM

Publication list

Preprint.....

Robust Monte Carlo methods

- [1] Gobet E., Lerasle M., Métivier, D. (2022) *Mean estimation for Randomized Quasi Monte Carlo method*. HAL 03631879

In preparation.....

Climate Change and risks

- [2] Gobet E., Métivier, D., Parey S. (in preparation should be available on HAL in May 2022). *Interpretable hidden Markov model for stochastic weather generation and climate change analysis*.

Conference Proceedings.....

Uncertainty Quantification in Power Systems

- [3] Métivier, D., Vuffray M., Misra S. (2019). *Efficient Polynomial Chaos Expansion for Uncertainty Quantification in Power Systems*. Electric Power Systems Research 189, 106791 **Proceedings of the 2020 Power Systems Computation Conference**, Porto Portugal; arXiv:1910.06498

International Peer Reviewed Journal.....

Mean Field Control

- [4] Luchnikov I., Métivier D., Ouerdane H., Chertkov M. (2021) *Super-relaxation of space–time-quantized ensemble of energy loads to curtail their synchronization after demand response perturbation*; Applied Energy 285, 116419 arXiv:2008.03118
- [5] Métivier, D., Chertkov C. (2020). *Mean Field Control for Efficient Mixing of Energy Loads*; Phys. Rev. E 101, 022115; arXiv:1810.00450.
- [6] Métivier, D., Luchnikov I., Chertkov C. (2019). *Power of Ensemble Diversity and Randomization for Energy Aggregation*; Scientific reports 9 (1), 5910; arXiv:1808.09555.

Bifurcations in Vlasov and Kuramoto models

- [7] Barré J., Métivier D., Yamaguchi Y. Y. (2020). *Towards a classification of bifurcations in Vlasov equations*. Phys. Rev. E 102, 052208; arXiv:1909.11344
- [8] Métivier, D., Wetzel, L., Gupta S., *Onset of synchronization in networks of second-order Kuramoto oscillators with delayed coupling: Exact results and application to phase-locked loops* (2020). Phys. Rev. Research 2, 023183 arXiv:1906.02643
- [9] Métivier D., Gupta S. (2019). *Bifurcations in the time-delayed Kuramoto model of coupled oscillators: Exact results*; J Stat Phys 176: 279; arXiv:1808.10436.
- [10] Barré J, Métivier D. (2018) *Vlasov-Fokker-Planck equation: stochastic stability of resonances and unstable manifold expansion*; Nonlinearity 31 4667; arXiv:1703.01668.
- [11] Barré J., Métivier D. (2016). *Bifurcations and singularities for coupled oscillators with inertia and frustration*; Physical Review Letters, 117(21), 214102.; arXiv:1605.02990.
- [12] Barré J., Métivier D., Yamaguchi Y. Y. (2016). *Trapping scaling for bifurcations in the Vlasov systems*. Physical Review E, 93(4), 042207.; arXiv:1511.07645

Magneto-Optical Traps

- [13] Barré J., Kaiser R., Labeyrie G., Marcos B., Métivier, D. (2019). *Towards a measurement of the Debye length in very large Magneto-Optical traps*. Phys. Rev. A 100, 013624; arXiv:1808.02098.

Lieb-Robinson bounds

- [14] Métivier D., Bachelard R., Kastner M. (2014). *Spreading of Perturbations in Long-Range Interacting Classical Lattice Models*. Physical Review Letters, 112(21), 210601.; arXiv:1405.7556.