JOURNÉES DE PHYSIQUE STATISTIQUE

Paris – Thursday January 27 & Friday January 28, 2022

Welcome to the 41st edition of the “Journées de Physique Statistique”.

Registration: fill in the form only if you have not already registered electronically and remember to wear your badge.

Communications were, as far as possible, grouped by topics.

The duration of short talks is **4 minutes** altogether (3 minutes for the talk itself +1 minute for discussions). Please avoid presenting more than two or three slides.

The preferred language is **English**.

We thank the physics department of ENS Paris for its help with the logistics, and both the ENS and the FRIF for their financial support.

Organization team:

Camille Aron (Ens Paris / CNRS)

Cécile Cottin-Bizonne (Univ. Lyon I / CNRS)

Vivien Lecomte (Univ. Grenoble-Alpes / CNRS)

Emmanuel Trizac (Univ. Paris-Saclay / CNRS)

Frédéric van Wijland (Univ. de Paris / CNRS)

Francesco Zamponi (Ens Paris / CNRS)

Département de Physique
École normale supérieure

ENS

LPENS
LABORATOIRE DE PHYSIQUE DE L'ÉCOLE NORMALE SUPÉRIEURE

FRIF

PROGRAMME

Thursday January 27, 2022

8h30 - 9h15 Registration - Pass check

9h15 - 11h00 **Série A** (Chairman: Camille Aron)

11h00 - 11h20 Pause (no coffee)

11h20 - 11h50 **Alice Guionnet (ENS Lyon / CNRS)**

The uses of large deviation theory in random matrix theory

11h50 - 12h20 **Freddy Bouchet (ENS Lyon / CNRS)**

Path large deviations for kinetic theories: beyond the Boltzmann, the Landau, and the Lenard–Balescu kinetic equations — A new perspective on the irreversibility paradox

12h20 - 14h00 Lunch time

14h00 - 14h30 **Hamid Kellay (LOMA)**

From collections of independent, mindless robots to flexible, mobile, and directional superstructures

14h30 - 15h00 **Julien Tailleur (MSC / CNRS)**

Collective behaviours of active particles: in and out of equilibrium

15h00 - 15h20 Pause (no coffee)

15h20 - 16h35 **Série B** (Chairman: Vivien Lecomte)

16h35 - 16h50 Pause (no coffee)

16h50 - 18h05 **Série B** – continued

Friday January 28, 2022

9h00 - 10h30 **Série C** (Chairman: Frédéric van Wijland)

10h30 - 10h50 Pause (no coffee)

10h50 - 11h20 **Francesco Zamponi (ENS / CNRS)**

Recent progresses in the mean-field approach to the structural glass transition

11h20 - 11h50 **Jasna Brujic (NYU)**

Programmable folding of colloidal polymers

11h50 - 13h30 Lunch time

13h30 - 14h00 **Cécile Appert-Rolland (IJCLab / CNRS)**

Pedestrians and crowds: Experiment-based models

14h00 - 14h30 **Anna Minguzzi (LPMMC / CNRS)**

Emergence of Kardar–Parisi–Zhang physics in excitons polaritons

14h30 - 14h50 Pause (no coffee)

14h50 - 16h05 **Série D** (Chairwoman: Cécile Cottin-Bizonne)

Série A – chairman: Camille Aron

Thursday January 27, 9h15 - 11h00

- **DZIK Eden**

  CEA Saclay

  Taking up the challenge of glass transition by optical manipulations of molecules

- **FOLENA, Giampaolo**

  LPENS

  Mean field theory for low temperature glasses

- **TER BURG, Cathelijne**

  LPENS

  Force-force correlations in disordered magnets

- **KENT-DOBIAS, Jaron**

  Laboratoire de Physique de l'Ecole Normale Supérieure

  Analytic continuation over complex landscapes

- **MUKERJEE, Gauthier**

  LPENS

  Depinning of interfaces in the quenched Kardar–Parisi–Zhang universality class

- **LESIEUR, Thibault**

  CGG R&D

  Optimization of the dynamic transition in the continuous coloring problem

- **REFINETTI, Maria**

  LPTENS

  Classifying high-dimensional Gaussian mixtures: Where kernel methods fail and neural networks succeed

- **VENTURA, Enrico**

  LPENS & La Sapienza

  "Supervised Vs. Unsupervised learning: approaching optimal memory retrieval in Hopfield networks"

- **ALTIERI, Ada**

  Laboratoire Matière et Systèmes Complexes

  Evidence of glassy phases in large well-mixed ecosystems both in the competitive and cooperative case

- **FLACK, Ana**

  LPTMS

  Truncated linear statistics in the one dimensional one-component plasma

- **CONTE, Robert**

  Centre Borelli, ENS Paris-Saclay

  Toutes les ondes propagatives méromorphes de Ginzburg-Landau complexe cubique et quintique

- **ZHENG, Zechuan**

  LPENS

  Bootstrap method in large-N matrix model

- **GOURAUD, Gabriel**

  LPENS

  Quantum Quench for Free Fermions with delta impurity

- **BRINGUIER, Eric**

  Matériaux et Phénomènes Quantiques, UMR 7162 CNRS & Université Paris-Diderot

  Statistical-mechanics derivation of Fermi's golden rule

- **SRDINSEK, Miha**

  Pasteur - UMR 8640

  Rényi entanglement entropy by optimal thermodynamic integration paths

- **COPPOLA, Michele**

  LPCT

  Growth of entanglement entropy under local projective measurements

- **DAGO, Salambô**

  Laboratoire de Physique de l'ENS de Lyon

  How much does it cost to erase 1 bit of information?

- **ANGELONE, Adriano**

  LPTMC

  Critical properties of long-range quantum spin models

- **MAJUMDAR, Saptarshi**

  LPTMS

  Phase transition in Open Quantum Systems

- **WERNER, Félix**

  LKB, ENS, Paris

  High-order diagrammatic expansion around BCS: polarized superfluid phase of the attractive Hubbard model

- **SQUARCINI, Alessio**

  Max Planck Institute for Intelligent Systems

  Critical Casimir interaction between complex particles in two spatial dimensions. Exact results

- **YADALAM, Hari Kumar**

  Laboratoire de physique de l'École Normale Supérieure

  Quantum Chaos in the dissipative Dicke model

Série B – chairman: Vivien Lecomte

Thursday January 27, 15h20 - 18h05

- **CLEMENT, Eric**

  PMMH

  Bacteria motility in complex fluids

- **DINELLI, Alberto**

  Laboratoire Matière et Systèmes Complexes, Université de Paris

  Self-organization of bacterial mixtures in the presence of quorum-sensing interactions

- **BAILLOU, Renaud**

  PMMH

  Bacterial exploration in confined environment

- **AL ALAM, Edouardo**

  LIPhy (Laboratoire Interdisciplinaire de Physique)

  Extreme congestion of microswimmers at a bottleneck constriction: Effect of swimming velocity and outlet size

- **IZZET, Adrien**

  Centre de Biologie et Innovation, ESPCI

  The unexpected role of solvent in the rheology of non-Brownian polymeric bead suspensions

- **BAROIS, Thomas**

  Laboratoire Ondes et Matière d'Aquitaine

  Maxwell's demon is a "Dahu" cockroach

- **BESSE, Marc**

  LPTMC

  Active interface

- **DECAYEUX, Jeanne**

  PHENIX

  Spontaneous propulsion of an isotropic colloid in a phase-separating medium

- **BACONNIER, Paul**

  Gulliver, ESPCI Paris

  Tension-control switch between collective actuations in active solids

- **FELIACHI, Ouassim**

  Institut Denis Poisson, Université d'Orléans

  Fluctuating hydrodynamics for active particle models

- **ZHANG, Yiwei**

  DPhyMS, Luxembourg

  Pulsating soft particles: a new class of active matter

- **MIRANDA-FILHO, Luciano Hugo**

  Departamento de Física, Universidade Federal Rural de Pernambuco

  Chaos in the Vicsek model

- **HEM, Jérôme**

  Gulliver / ESPCI

  Stochastic force inference applied to Janus particles

- **SOLON, Alexandre**

  LPTMC

  Susceptibility of Polar Flocks to Spatial Anisotropy

- **RIZKALLAH, Pierre**

  PHENIX

  Diffusion of a run-and-tumble particle in crowded environment

- **RICARD, Guillaume**

  Matière et Systèmes Complexes (MSC)

  Experimental quasi-1D capillary-wave turbulence

- **GORCE, Jean-Baptiste**

  Laboratoire Matière et Systèmes Complexes

  Three-dimensional turbulence generated homogeneously by magnetic particles

- **BAE, Changwoo**

  Institut Lumière Matière (ILM)

  Surfactant driven motion of a bubble under an electric field

- **DUCHESNE, Alexis**

  IEMN

  An everlasting bubble?

- **FILLETTE, Jules**

  LPENS (ENS) & MSC (Univ Paris)

  Wave focusing on the surface of a fluid

- **HENRY, Hervé**

  PMC, CNRS, École Polytechnique

  Self similarity loss during hydrodynamic coarsening of a phase separated mixture: effect of the viscosity contrast

- **LIMAT, Laurent**

  MSC, Matière et Systèmes Complexes, UMR 7057, CNRS et Université de Paris

  Ressaut circulaire hydraulique: où s'applique la tension de surface?

- **ALLEMAND, Aymeric**

  Institut Lumière Matière (ILM)

  Non-linear fluidic transport in asymmetric channels

- **NOVKOSKI, Filip**

  Matière et Systèmes Complexes

  Nonlinear waves along a torus of fluid

- **HIDALGO-CABALLERO, Samuel**

  Gulliver and Institut Langevin

  Random exploration of bounded domains via closed-loop trajectories

- **METAYER, Simon**

  LPTHE

  A three-loop order approach to flat polymerized membranes

- **SORICHETTI, Valerio**

  LPTMS

  Fluctuations control the assembly of semiflexible filaments

- **KOEHLER, Lara**

  LPTMS

  Understanding fibers with renormalization

- **ALEXANDRE, Arthur**

  Laboratoire Ondes et Matière d'Aquitaine

  Dispersion of tracer particles in undulated channels

- **LENZ, Martin**

  LPTMS & PMMH

  Valence can control the non-exponential viscoelastic relaxation of reversible multivalent gels

- **MURALEEDHARA PAI, Mayarani**

  LPTMS

  Towards Understanding Frustrated Self-assembly Using 3D Printed Colloids

- **TERZI, M. Mert**

  LPTMS

  Collective deformation modes promote fibrous self-assembly in protein-like particles

- **HERRMANN, Hans**

  PMMH, ESPCI Paris

  Patterns formed by chains of magnetic beads

Série C – chairman: Frédéric van Wijland

Friday January 28, 9h00 - 10h30

- **POLETTINI, Matteo**

  Complex Systems and Statistical Mechanics, Luxembourg

  Towards Transition Thermodynamics

- **O'BYRNE, Jérémy**

  Laboratoire Matière et Systèmes Complexes, Université de Paris

  Nonequilibrium Currents in Stochastic Field Theories: a Geometric Insight

- **VERLEY, Gatien**

  IJClab

  Dynamical equivalence classes

- **LAGOIN, Marc**

  Laboratoire de Physique, ENS de Lyon

  Maxwell demon in macroscopical systems

- **GRANERO BELINCHON, Carlos**

  Lab-STICC

  Quantifying Non-Stationarity with Information Theory

- **ARCHAMBAULT, Aubin**

  Laboratoire de physique à l'ENS de Lyon

  Fluctuation Theorem applied to sub-nN force measurements

- **MUÑOZ BASAGOITI, Maitane**

  Gulliver ESPCI

  Catalysis From The Bottom-Up

- **COGHI, Francesco**

  NORDITA, Sweden

  Role of current fluctuations in nonreversible samplers

- **TUPIKINA, Liubov**

  CRI, Bell labs

  Continuous limits of heterogeneous continuous random walks

- **KLINGER, Jérémie**

  LPTMC

  Joint statistics of space and time exploration of 1d random walks

- **DAL CENGIO, Sara**

  Laboratoire Interdisciplinaire de Physique (LIPhy)

  Schnakenberg without Schnakenberg

- **CERBUS, Rory**

  Laboratoire Ondes et Matière d'Aquitaine, Université de Bordeaux

  Universality in landslide runout distance

- **PONCET, Alexis**

  Laboratoire de physique, ENS de Lyon

  Mechanics of non-reciprocal crystals

- **DE BRUYNE, Benjamin**

  LPTMS

  Resetting in stochastic optimal control

- **MOHITE, Atul Tanaji**

  Statistical Physics of Active Matter Group, Luxembourg

  Optimizing phase transitions

- **ZAKINE, Ruben**

  Courant Institute, NYU

  Predicting phase transitions in nonequilibrium systems

- **GOERLICH, Rémi**

  Institut de Physique et Chimie des Matériaux de Strasbourg (IPCMS)

  Harvesting information to control non-equilibrium states of active matter

- **MOSLONKA, Charles**

  Gulliver

  Martingale-induced Local Invariance in Progressive Quenching

- **LECOMTE, Vivien**

  Laboratoire Interdisciplinaire de Physique (LIPhy)

  Path-integral calculus: discretization and covariance(s)

Série D – chairwoman: Cécile Cottin-Bizonne

Friday January 28, 14h50 - 16h00

- **NICOLAS, Alexandre**

  ILM

  A physical approach to car parking

- **XIE, Chuanzhi**

  ILM

  Modeling the Adult-Child Mixed Pedestrian Flow: a Time to Collision-Velocity based Model

- **SINTES, Guillaume**

  Gulliver / PMMH

  Frustrated run and tumble of E. coli bacteria in LCs

- **LORENZETTI, Enrico**

  LadHyx

  Modelling mechanosensensor dynamics in fission yeast

- **BISARDI, Matteo**

  LPENS

  Modeling experimental protein evolution: first Monte Carlo steps

- **GOUTALAND, Quentin**

  Laboratoire Matière et Systèmes Complexes

  Binding of thermalized and active membrane curvature-inducing proteins

- **RUIZ ORTEGA, Maria**

  LPENS

  Modeling and predicting the overlap of B- and receptor repertoires in healthy and SARS-CoV-2 infected individuals

- **CHEN, Xiaowen**

  LPENS

  Generalized Glauber dynamics for inference problems in biology

- **ZEITLER, Leo**

  Université Paris-Saclay, CEA, CNRS, Institute for Integrative Biology of the Cell (I2BC)

  A Combination of Physical Modelling and Machine Learning Could Improve Our Understanding of DNA Repair Mechanisms

- **CAMAGLIA, Francesco**

  LPENS

  Probing T cell thymic maturation through repertoire sequencing

- **BENSOUDA, Meriem**

  LPENS

  Inferring and predicting T-cells repertoire turnover for healthy individuals.

- **KÜHN, Tobias**

  LPENS

  Diagrammatic solution to the inverse problem in simple liquids and spin systems

- **FÖLDES, Timothy**

  LPTMC

  Assessing the polymer coil-globule state of chromatin from its very first spectral modes

- **ZHENGYANG, Liu**

  Gulliver, ESPCI Paris

  Collective motion and reversible jamming in a droplet