

Statistical physics group

- Gatien Verley
MCF - Université Paris-Saclay

Stat. Mech. and Complex systems: Overview

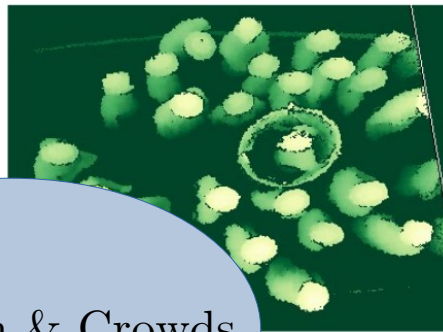
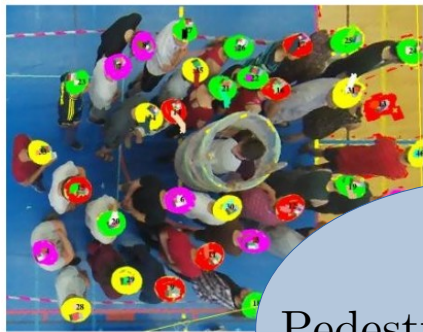
- **Top Down / Bottom up approaches**
 - Thermodynamics, Emergence, Few \rightarrow Many, Renormalization
- **Classical / Quantum**
 - Information, Quantum Thermo, Fluctuations
- **Equilibrium / Non-equilibrium**
 - Relaxing, Steady, Glassy, Active, Exact Models
- **Linear / Non-linear theory**
 - Transport coeff., Hydrodynamic approach
 - Bifurcation, Emergence
- **Soft / Biological / Condensed Matter**
 - Rheology, State equations, Protein folding, Gene regulation
 - Phase transitions, Strong correlations, Solid State Physics

Summary

- Group members : Permanent, Ph.D.
 - Cécile → Transport
 - Matteo Butano → Pedestrian traffic (with LPTMS)
 - Henk → Stoch. processes, tessellations, exact methods
 - Gatien → Stochastic processes and thermodynamics
 - Paul Raux → Thermodynamic circuits (with LIED)

- General interests

Cécile Appert-Rolland



Pedestrian & Crowds

TRANSPORT

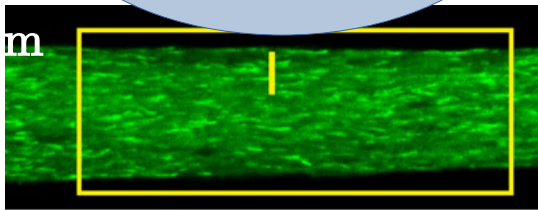
Toy-models for out-of-equilibrium systems

Data analysis

Models

Intracellular transport

Heat transfer in building insulation

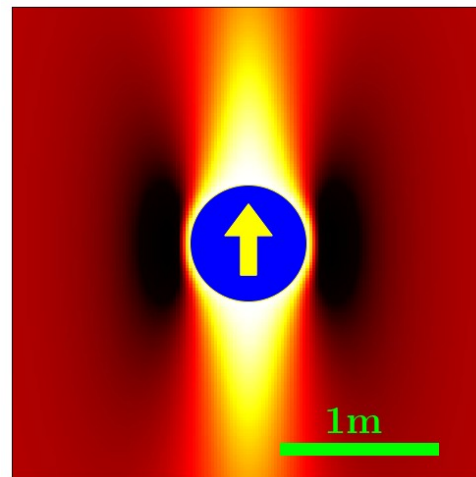
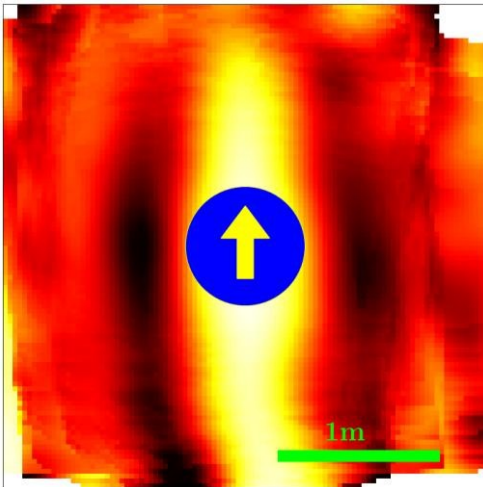


polymerizing microtubules

Matteo Butano



- Turin (italy)
- Physics of complex systems
 - Thesis : “Mean-field Games applied to pedestrian dynamics”

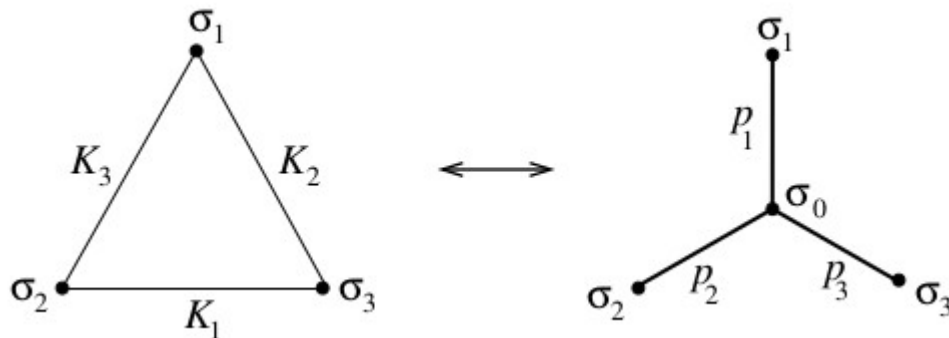


- Hobby : Diving in the sea

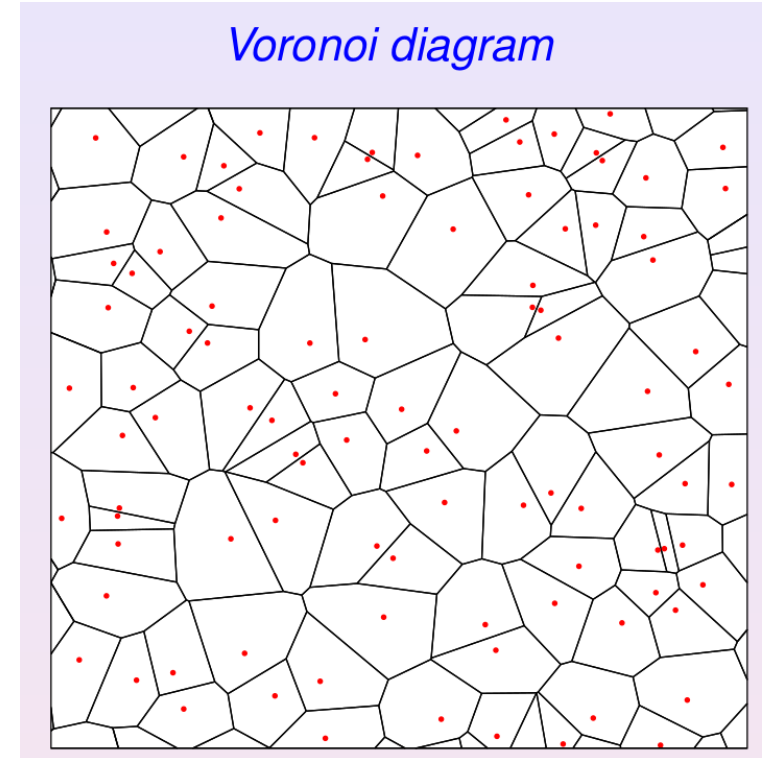
Henk Hilhorst

- Stochastic processes
 - Application to tessellation of the plane (Voronoi cells)
 - Recent application to interacting active particles
- Exact methods for models of ferromagnetism (Ising, ...)

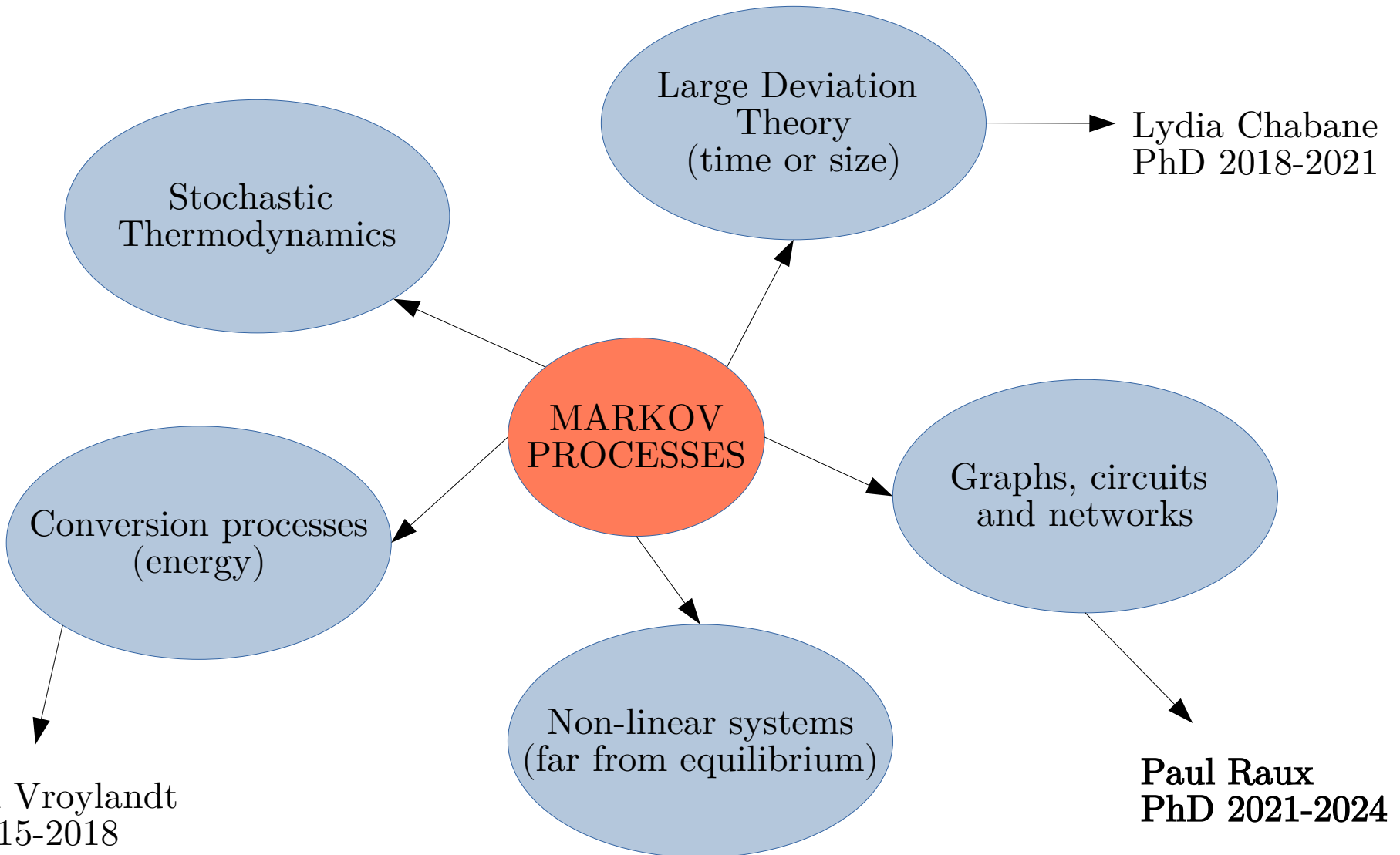
Star-triangle transformation in 2D spin lattice :



→ Emeritus



Gatien Verley



Paul RAUX (3rd year phd student)

- **Circuit of thermodynamic devices in NESS**
 - Applications to TEG, chemical reactions, Stoch. engines
- **Maxwell demons: physics of information ?**
 - Extract work from continuous measurements and feedbacks on a system
- **Teaching:**
 - Tutorials and practical session in Electronics (Bachelor level)
- **Hobbies**
 - Clarinet player
 - Member of a wind orchestra (retired)
 - Member of a symphonic orchestra (retired)

Hobbies & family & actions

- **Cécile :**

- 3 young adults
- Singing baroque music

- **Gatien :**

- 1 girl, 1 boy (1 and 3 years old)
- Board games fan (not retired)
- Lindy hop & Yoga & Improvisation (retired !)

- **Environment enthusiasts :**

- ECOCLIM 2018, 2021, 2023
- WG environment of IJClab (join us)
- GECCO (Univ. Paris Saclay), labo 1.5
- Lectures energy conversion (L3 & M1)

