JMC Grenoble 2018 – August 27-31
Mini colloquium « Active Fluids and crowd motions »

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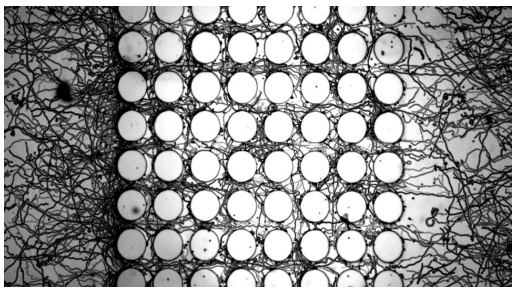
Active matter is composed of a large number of mobile entities that move autonomously by exerting mechanical forces on their environment. Examples of active ingredients are, for example, schools of fish, bird swarms. Active fluids are composed of active particles swimming in a fluid, like plankton or bacteria suspensions as well as artificial self-propelled particles. These systems are intrinsically out of equilibrium like a large majority of living systems because of the local injection of energy. As a result, active systems represent fertile ground for out of equilibrium thermodynamic models.

Crowd movement modeling has become a very active area of research over the last decade, and it still presents deep and open problems. In particular, certain effects observed in real panic situations are not yet fully understood in terms of microscopic behavior, *i.e.* at the level of each person. The dangerous nature of certain situations makes it difficult or even impossible for real size experiments. The comparison with granular media, especially for contacts, is often mentioned but rarely the analogies with the collective effects observed in active fluids. Indeed, in many respects (contact forces, repulsion or attraction between individuals, attraction towards a given direction, confinement, collective effects ...) the concepts developed in each domain can complement and enrich each other and it seems appropriate to bring together at the French level the different teams working on these topics.

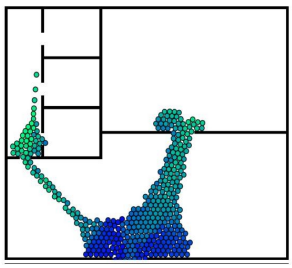
Invited speakers :

- Ignacio Pagonabarraga, University of Barcelona, Spain
Clogging transition through a single or multiple constrictions: from passive to active matter

- Alexandre Nicolas LPT, Paris-Sud Orsay, France
Dense pedestrian crowds at bottlenecks: How do the pedestrians' behaviours kick in



Phototactic plancton crossing a pilar network
Experiment - Salima Rafaï (c)



Evacuation of a building by a crowd
Numerical simulations – Bertrand Maury (c)

This mini-colloquium is sponsored by Fed3G
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