Séminares EDP de l'ERC ReaDi
Equations de réaction-diffusion, propogation et modélisation
Henri Berestycki

Les membres du projet ERC ReaDi sont heureux d'annoncer le lancement de la deuxième saison du cycle de séminaires autour des Equations aux Dérivées Partielles qui se tiendront à l'Ecole des Hautes Etudes en Sciences Sociales à commencer du 26 Janvier.

Retrouvez toutes les informations sur le séminaire : http://readi-project.weebly.com/pde-seminar.html (Attention : certaines dates ont été modifiées).

Septième séance : **jeudi 17 mars à 11h00**
Salle 466, EHESS, 190-198 avenue de France, 75013 - Paris

Vincent Calvez, *Ecole Normale Supérieure de Lyon*

Titre: **Concentration waves of bacteria at the mesoscopic scale**

Résumé : Concentration waves of swimming bacteria Escherichia coli were described in his seminal paper by Adler (Science 1966). These experiments gave rise to intensive PDE modelling and analysis, after the original model by Keller and Segel (J. Theor. Biol. 1971), and the work of Alt and co-authors in the 80's. Together with Bournaveas, Perthame, Raoul and Schmeiser, we have revisited this old problem from the point of view of kinetic transport equations. This framework is very much adapted to the so-called run-and-tumble motion, in which any bacteria modulate the frequency of reorientation (tumble) – and thus the duration of free runs – depending on chemical variations in its environment.

In this talk, I will present existence results for solitary waves both at the macroscopic scale, and at the mesoscopic scale. The macroscopic problem consists of a drift-diffusion equation derived from the kinetic equation after a suitable diffusive rescaling, coupled to two reaction-diffusion equations. Mathematical difficulties arise at the mesoscopic scale, where the proof of existence of travelling waves require a refined description of spatial and velocity profiles.

I will also present numerical simulations done in collaboration with Gosse and Twarogowska, in order to illustrate some unexpected behavior of the mesoscopic problem.

Organisateurs : Andrea Tellini et Alessandro Zilio

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