Online Seminar on Chemotaxis

Date: 14th of November 2023   16:00 – 17:00 in "Beijing" hour
(which is 9:00 – 10:00 in "Central EU" hour and 17:00 – 18:00 in "Seoul–Tokyo" hour)
Speaker: Jose A. Carrillo (University of Oxford, UK)
Title:
Nonlocal Aggregation-Diffusion Equations: fast diffusion and partial concentration

Abstract:
We will discuss several recent results for aggregation-diffusion equations related to partial concentration of the density of particles. Nonlinear diffusions with homogeneous kernels will be reviewed quickly in the case of degenerate diffusions to have a full picture of the problem. Most of the talk will be devoted to discuss the less explored case of fast diffusion with homogeneous kernels with positive powers. We will first concentrate in the case of stationary solutions by looking at minimizers of the associated free energy showing that the minimizer must consist of a regular smooth solution with singularity at the origin plus possibly a partial concentration of the mass at the origin. We will give necessary conditions for this partial mass concentration to and not to happen. We will then look at the related evolution problem and show that for a given confinement potential this concentration happens in infinite time under certain conditions. We will briefly discuss the latest developments when we introduce the aggregation term. This talk is based on a series of works in collaboration with M. Delgadino, J. Dolbeault, A. Fernández, R. Frank, D. Gómez-Castro, F. Hoffmann, M. Lewin, and J. L, Vázquez.

Seminar website: `http://www.math.tohoku.ac.jp/~fujie/OSC.html`

Organizers: Jie Jiang (jiang@apm.ac.cn) and Kentaro Fujie (fujie@tohoku.ac.jp)