

**Franca Hoffmann**

*Homogeneous functionals in the fair-competition regime*

We study interacting particles behaving according to a reaction-diffusion equation with non-linear diffusion and non-local attractive interaction. This class of equations has a very nice gradient flow structure that allows us to make links to homogeneous functionals and variations of well-known functional inequalities (Hardy-Littlewood-Sobolev inequality, logarithmic Sobolev inequality). Depending on the non-linearity of the diffusion, the choice of interaction potential and the dimensionality, we obtain different regimes. Our goal is to understand better the asymptotic behaviour of solutions in each of these regimes, starting with the fair-competition regime where attractive and repulsive forces are in balance. This is joint work with Jos A. Carrillo and Vincent Calvez.