Stationary non-equilibrium solutions for coagulation equations

Alessia Nota[1]

[1] Department of Information Engineering, Computer Science and Mathematics, University of

L'Aquila, 67100, L'Aquila, Italy, `https://sites.google.com/view/alessianota`

Smoluchowski's coagulation equation is a classical model for mass aggregation phenomena extensively used in the analysis of problems of polymerization, particle aggregation in aerosols, drop formation in rain and several other situations. In this talk I will present some recent results on the problem of existence or non-existence of stationary solutions to coagulation equations, for single and multi-component systems, under non-equilibrium conditions which are induced by the addition of a source term for small cluster sizes. The most striking feature of these stationary solutions is that, whenever they exist, the solutions to multi-component systems exhibit an unusual "spontaneous localization" phenomena. More precisely, the stationary solutions to the multi-component coagulation equation asymptotically localize into a direction determined by the source term. (Joint work with M.A. Ferreira, J. Lukkarinen and J.J.L. Velázquez)

Submission for a contributed session