**Homogenization with Slender Bodies**

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In this talk, we aim to derive macroscopic equations for suspensions of slender bodies. A slender body is a particle of length $a_\varepsilon$ and width $b_\varepsilon$, where $b_\varepsilon \ll a_\varepsilon$ and $a_\varepsilon \to 0$ as $\varepsilon \to 0$. We consider the case in which these particles are fixed and distributed on a periodic grid $(2\varepsilon\mathbb{Z})^3$. We show that the solutions $u_\varepsilon$ of the stationary Stokes equation in a domain perforated by these particles converges, as $\varepsilon \to 0$, to a function $u$ solving a stationary Stokes equation with an additional Brinkman term $Mu$. This term represents an effective macroscopic drag induced by the particles.

To illustrate the main ideas, we first focus on the simpler setting of the Poisson equation and present the strategy for the proof introduced by Cioranescu and Murat. We then discuss the modifications required in the Stokes setting and briefly talk about directions for future work.