Seminar/Talk

Effective behavior of diffuse interface energies with microscopic heterogeneities

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Host: Christian Wagner

I will discuss the effective (or macroscopic) behavior of diffuse interface energies with microscopic heterogeneities. Diffuse interface energies, which describe phase interfaces at a mesoscopic scale, go back to the work of van der Waals (1896) and Cahn-Hilliard (1958). In the 1970s, Modica and Mortola gave the first mathematically rigorous arguments relating the diffuse interface approach to more classical, macroscopic-scale interfacial theories based on surface tension. Over the past twenty years, in the setting of heterogeneous media, there has been interest in the interplay between energy minimization and averaging in this problem. I will discuss my recent work with Christian Wagner, where we give a fairly comprehensive account of the setting where the length scale of the heterogeneities is much smaller (microscopic) than the diffusive interface width. The moral of the story is, indeed, homogenization effects dominate when the microscopic and mesoscopic scales are well-separated, but, in general, rare events (e.g., large deviations) play a role.

Tuesday, April 8, 2025 05:15pm - 06:15pm

Office Bldg West / Ground floor / Heinzel Seminar Room (I21.EG.101)

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