**Dynamic percolation in composite materials**

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This computational project will make inroads into the interplay of particle dynamics and the formation of percolating (system-spanning) networks in composite materials. The onset of percolating networks can profoundly affect the properties of a material. For example, if a formulation contains an electrically conducting component embedded in an insulating matrix then the onset of a percolating network transforms the mixture from an insulator to a conductor. Despite the importance of dynamics in the processing and formulation of materials, percolation has traditionally been treated as an equilibrium or quasi-static problem, so there is almost no work on the coupling of dynamics and percolation.  In this project we will start with groundwork on cluster dynamics at equilibrium and then progress to successively more complex cases such as shear.  The work will involve developing and coding bespoke simulation methodology and the calculations will deploy Durham's High Performance Computing facility, *hamilton*.  We have strong links with the theory group of Prof. Paul van der Schoot at Eindhoven University of Technology, and there will be opportunities to work collaboratively with them.