

Composite Structures with Highly Contrasting Properties

A. K. Nandakumaran (Department of Mathematics Indian Institute of Science, Bangalore)
and Ali Sili (Université du Sud Toulon)

Composite structures is an important area of research for last several decades and creating new composites is scientifically challenging and understanding it mathematically is much more complicated. Homogenization is one of the mathematical tool developed in the seventies and the research on homogenization is a thriving area.

In this project, we propose to consider a domain consisting of two materials with highly contrasting properties like: low and high elastic properties, conductivities etc. To be more precise, let Ω be a domain which has partitioned as $\Omega = B_\varepsilon \cup M_\varepsilon$ which describes the microstructure where we can think M_ε occupies the material whose property is of order 1, and B_ε are inclusions and it is a material with property α_ε . For example one can consider hyperbolic or elasticity equations and study the homogenization. One can also look into optimal and controllability problems.

Faculty members: A. K. Nandakumaran (IISc), Ali Sili (Université du Sud Toulon), François Murat, Laboratoire Jacques Louis Lions, CNRS et Université Pierre et Marie Curie, Paris, T. Muthukumar (Department of Mathematics, IITK, Kanpur)