Einladung

Würzburger Mathematisches Kolloquium

Julius-Maximilians-Universität Würzburg • Institut für Mathematik

Apala Majumdar

University of Strathclyde, Glasgow, Schottland

Solution Landscapes for Nematic Liquid Crystals and their Multitudinous Applications

Donnerstag, 22. November 2022 • 14:15 Uhr

Der Vortrag wird ***NUR*** als Zoom-Meeting übertragen: go.uniwue.de/ifmcolloquium-zoom

Abstract. Nematic liquid crystals are classical examples of partially ordered materials that combine fluidity with the order of crystalline solids. They are the working material of a range of electro-optic devices i.e. in the liquid crystal display industry and more recently, they are used in sensors, actuators, elastomers, security applications and pathological studies.

We review the celebrated Landau-de Gennes theory for nematic liquid crystals and focus on the modelling of nematics confined to thin quasi-2D systems, with reference to 2D polygons. We perform asymptotic analysis in certain distinguished limits, encoded in terms of geometrical, material and temperature-dependent parameters, accompanied by exhaustive studies of solution landscapes of thin nematic systems that include stable and unstable solution branches along with information about their connectivity. In the last leg of the talk, we discuss recipes for building three-dimensional Landau-de Gennes equilibria from their two-dimensional counterparts, and in doing so, we discover close connections between 2D and 3D solution landscapes in the Landau-de Gennes theoretical framework.

All collaborations will be acknowledged throughout the talk.

Alle sind herzlich eingeladen.

Die Dozentinnen und Dozenten der Mathematik