

Physics Colloquium

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The Onsager model for liquid crystals

Friday, April 6, 2017

2:30 pm—3:30 pm

210 Robeson Hall

The Onsager model in liquid crystal theory holds the status of the Ising model for phase transitions. They both take a different view from the phenomenological Landau-de Gennes model [liquid crystals] and Landau model [phase transitions] by relating the microscopic properties to the physical world. Identifiable molecular parameters are used in the Onsager model, allowing direct interpretation of experiments and computer simulation results. While the original model was proposed 70 years ago to deal with the bulk isotropic-nematic transition, adding geometric frustrations gives the model a new life. In this talk, the solutions of the model for a number of confined systems of current interest, which display topological defects due to the frustrations between geometry and the nematic ordering field, are presented.