UNIVERSITÄT SALZBURG

Fachbereich Mathematik
Hellbrunnerstraße 34
5020 Salzburg

Gastvortrag

Mittwoch, 23. Mai 2018
15.00 Uhr
Hörsaal 411

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Tangling in Liquids

Abstract:

Currently my work investigates energy functionals defined on a tubular neighbourhood of simple closed curves in $\mathbb{R}^3$ or $\mathbb{T}^3$, knotted or unknotted, where the second variety may be imagined as a set of periodically interwoven non--intersecting curves.
I am interested in the physical relevance of entanglement of such tube-like patterns.
Currently, as part of my PhD thesis I am considering the solvation free energy, which gives the thermodynamical energy of a fluid with the knotted tube-like object as the solvent.
Recent work shows that the solvation free energy can be calculated from geometric properties of the solvent (here a knotted curve) and thermodynamic constants associated with the fluid.
In general, a solvent will change its shape when dissolved in a fluid, in doing so minimising the energy associated with the solvation process. Following this observation, our main question is to investigate the effects of tangling or knottedness on the shape of the dissolved configuration.
This energy function is particularly interesting because of its broad applications to any entangled structure submerged in a solvent, for example protein structures in a cellular environment.
In this talk I will present my on-going work. The major effort of which is to create a computational tool with which energy minimising experiments may be performed.

Einladende: Simon Blatt und Nicole Vorderobermeier