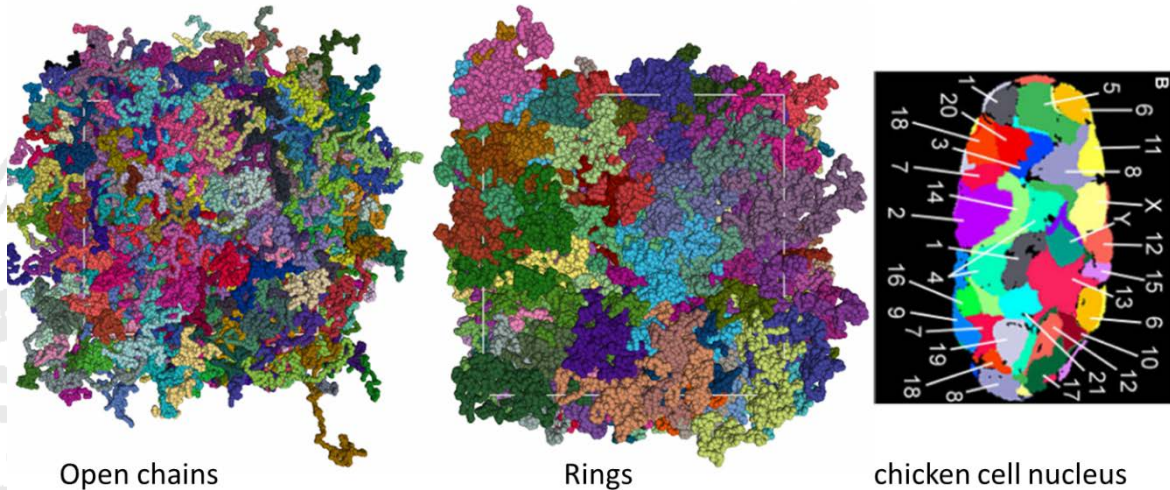


# PHYSIKALISCHES KOLLOQUIUM

AM 13. JANUAR 2020 UM 17 UHR C.T.

IM GROßEN HÖRSAAL



## SOFT MATTER: TOPOLOGICAL CONSTRAINTS DO MATTER

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Most biological systems and a huge class of everyday products ranging from simple plastics to complex functional systems and to most foods are made of soft matter. Its generic properties are mostly governed by the statistical mechanics of strongly fluctuating huge molecules, such as polymers. For this the plain fact that polymer chains cannot cross through each other introduces significant constraints and is of central importance, e.g. for polymer rheology where entanglements dominate the dynamics or for chromosome territories in the cell nucleus in biophysics, where “topological repulsion” plays a role. Such constraints can be permanent, as for gels and networks or ring polymers or temporary but long lived as in polymer melts or for chromosome organization in the cell nucleus. By manipulating entanglements new non-equilibrium materials can be made. Currently there is no comprehensive analytic theory, which links topological constraints to material properties. The talk will give an overview of recent developments and point to some challenging opportunities based on advances in computational physics of soft matter and experiment.

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