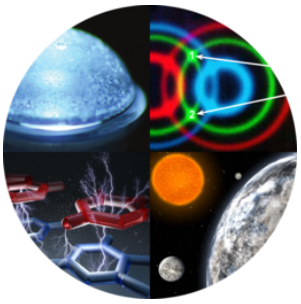

Münchner Physik-Kolloquium

at home! Winter 2021/22

Sliding, pushing, crashing: the treacherous pathways of chromosome replication in a crowded world

Prof. Dr. Karl Duderstadt, *Max-Planck-Institut für Biochemie and TUM*

Monday, 24 January 2022, 17:15 h
https://tum-conf.zoom.us/j/93234766313 Meeting-ID: 932 3476 6313 Password: Kolloquium
Please install the software in advance.

Life as we know it is the product of fundamental physical laws and randomness. This interplay shapes biology on all time and length scales, from the dynamics of populations to the most basic cellular processes. On the molecular scale, where key transactions require energies not far above those of thermal fluctuations, noise is intrinsic and dominant. Nevertheless, how chance encounters and random events influence molecular pathways is not well understood. In this seminar, these ideas will be explored in the context of chromosome replication where a broad range of structurally diverse challenges frequently arise. We gain access to these dynamics using single-molecule imaging approaches that provide direct observations of the stochastic events that reshape molecular pathways. In particular, how transcription-replication conflicts can forever alter the pathway of replisome assembly will be presented and how replisomes overcome intrinsic features of chromosome architecture including nucleosomes and unfavorable topological states will be discussed. Taken together, these studies reveal a surprising resilience in replication pathways that helps to ensure chromosome integrity and the faithful transfer of genetic information from one generation to the next.