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Physikalisches Kolloquium — Physics Colloquium

Einladung — **Invitation**

Monday, 18 November 2019

Lecture Hall N24/H13, 16:15

Coffee and cookies will be served in front of the lecture hall from 16:00

Structure of capillary suspensions and their applications

Prof. Erin Koos

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Ternary liquid-liquid-solid systems exhibit a wide variety of different morphologies depending on the ratio of the three components. With small amounts of secondary fluid, the characteristic mechanical strength of such capillary suspensions arises due to the capillary force inducing a percolating network of particles bridged by small individual droplets of secondary fluid. Spatial information on the structure of such particle networks can be obtained using 3D confocal microscopy on an index-matched model system and directly correlated to changes in the mechanical strength or mixing conditions (Figure 1).

These capillary suspensions can be used in several different application pathways. We can use capillary suspensions to produce stable suspensions using conductive particles that have a twofold increase in conductivity over existing formulations using polymeric stabilization. The particle network can be preserved either through sintering or direct polymerization of the bridges to create materials with a high open porosity (up to 80%) with a narrow, micrometer-sized pore distribution.

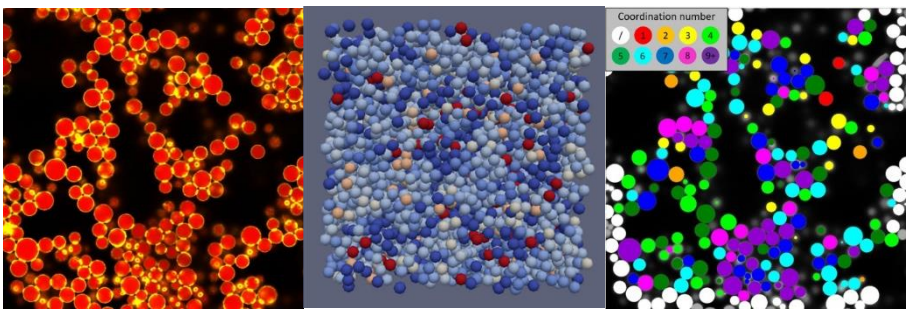

Fig. 1. (left) 2D confocal image slice (center) colored by the coordination number of a capillary suspension of silica particles with added aqueous glycerol. (right) Simulated network structure colored by clustering coefficient.

Host: Prof. Dr. Othmar Marti, Institute of Experimental Physics

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