Illu: Maurer-Neumann

SLAM Seminar

Heterogeneously charged colloids for functional materials

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Host: Jérémie Palacci

Heterogeneously charged colloids are promising building blocks for the self-assembly of target structures with specific properties at the nano- and micro-scale. Thanks to the inter-play between orientation-dependent attraction and repulsion -- induced by the interactions between like/oppositely charged regions on the particle surface -- experimentally accessible surface patterns are complex enough to favor the formation and/or stabilization of specific structures of interest.

Using state-of-the-art computational techniques and appropriately developed theoretical frameworks, we the design colloids with charged surface regions and study their assembly and equilibrium properties.
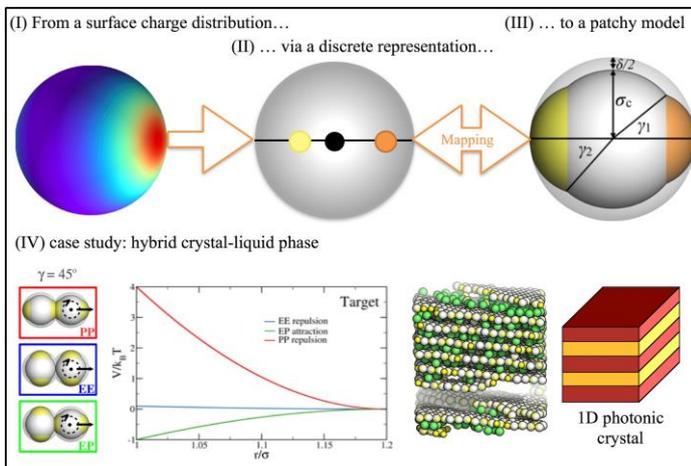
In my talk, I will (a) introduce the analytical/numerical description I developed to derive the effective inter-particle potential (panels I and II of the figure below), (b) describe the associated coarse-grained model that can be easily implemented in Molecular Dynamics simulations codes (panel III of the figure), (c) show the experimental particles that are currently synthesized by my collaborators, and (d) describe an interesting case study to elucidate the great potentialities of this class of colloids (panel IV of the figure).

Figure: A given charge surface pattern (panel I) is represented by an ensemble of discrete charges inside the colloid (panel II), the underlying symmetries of the charge distribution are then used to design a patchy model with charged regions of finite extent (panel III).

Thursday, November 4, 2021 at 11am
Heinzel Seminar Room / Office Bldg West (I21.EG.101)

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