

# Colloidal and confined blue phases

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Cholesteric blue phases (BPs) that can exist in a relatively narrow temperature range between an isotropic and cholesteric liquid crystal phase are composed of a regular array of  $-1/2$  disclinations and so-called double-twist cylinders. In this lecture colloidal dispersions in bulk and confined BPs will be discussed. After a brief introduction of phases we first focus our attention to disclination networks as possible trapping sites for small colloidal particles [1]. Based on the Landau-de Gennes approach, the stability of dispersions, crystalline arrangements of colloidal particles, and limitations due to size and surface anchoring of inclusions will be discussed. In the second part of the lecture we will focus our attention on the confinement to thin layers where BPs exhibit numerous exotic structures: disclinations with double-helix form, disclination loops, undulating disclinations, and skyrmion structures [2-4]. Effects of the layer thickness and surface anchoring will be discussed. For two cases we illustrate how colloidal particles will distribute in disclinations [5]. These quasi 2D structures that can be easily manipulated by external stimuli via effecting liquid crystal and/or colloidal particles are expected to be relevant for photonic applications.

## References

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