

# Exploring resemblance between liquid crystal topological defects and particle physics

*Monday, 21 November 2022 13:00 (1 hour)*

There are experimentally observed long-range e.g. Coulomb-like interactions for topological defects in liquid crystals, suggesting investigation how far can we take this resemblance with particle physics. I will discuss postulating skyrmion-like Lagrangian to get electromagnetism for their effective dynamics, interpreting field curvature as electric field - making Gauss law count (quantized) topological charge, also regularizing charge to finite energy. For biaxial nematic - with 3 distinguished axes, hedgehogs of one of 3 axes are different mass realizations of the same topological charge - resembling 3 leptons. Further baryon-like topological structures require charge, which has to be compensated for neutron - suggesting why it is heavier than proton. For analog of quantum phase there is derived Klein-Gordon-like equation.

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