Contribution ID: **85**   Type: **Invited Lecture**

Landscape of QCD Vacuum

We found new solutions of the sourceless Yang-Mills equation describing the superposition of chromomagnetic vortices of oppositely oriented magnetic fluxes. These gauge field configurations have constant energy densities and are separated by potential barriers forming a complicated landscape. It is suggested that the solutions describe the condensate of chromomagnetic vortices and represent a dual analog of the Cooper pairs condensate in a superconductor. In the presence of an Abelian field and in a particular limit the solutions reduce to flat connections of zero energy density and are forming a complicated potential landscape of the QCD vacuum. A possible tunnelling transition between these superfluxon flat configurations and the flat configurations with non-vanishing Chern-Pontryagin index will wash out the CP violating θ angle to zero, dynamically restoring CP symmetry.

Phys.Lett.B 862 (2025) 139337

Phys.Lett.B 852 (2024) 138612

Nucl.Phys.B 1004 (2024) 116561

Primary author: SAVVIDY, George

Presenter: SAVVIDY, George