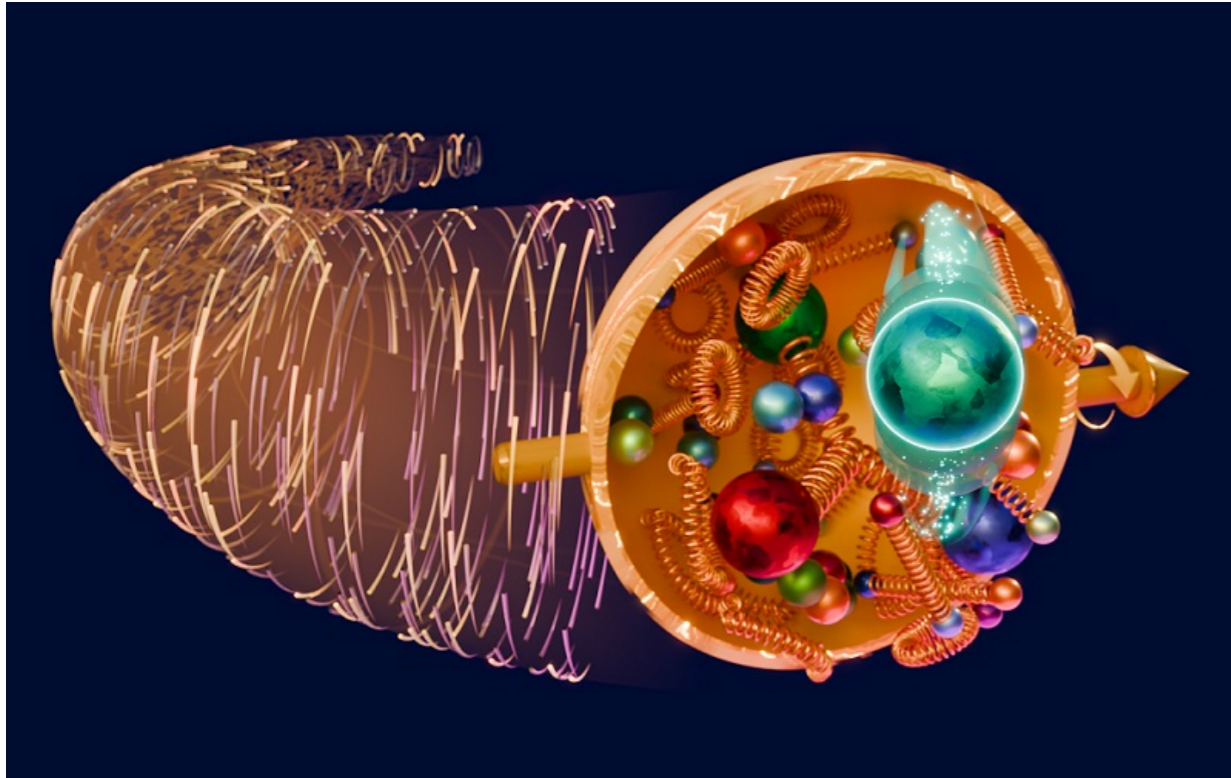


# Lattice QCD Reveals the Hidden Motion of Quarks in Protons



*[DOE SC Highlight: Calculation Sharpens Imaging of Protons' Insides](#)*

*[SciTechDaily](#)*

*[Phys. Rev. D, 109\(9\):094506, 2024.](#)*

*[Phys. Lett. B, 852:138617, 2024](#)*

***Accomplishment:*** First precise calculation of 3D transverse motion of quarks using chiral fermions and physical quark masses.

***Methods:*** The SciDAC project provided critical software and algorithms.

***Impact:*** Provide QCD input and reduce model-reliance for 3D imaging of proton at EIC experiments.