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Quantum Printing and Rectification

Friday 9 January 2026 09:05 (35 minutes)

I introduce the concept of quantum printing [1]– the imprinting of quantum states from photons and phonons onto quantum matter. The discussion is focusing on charged fluids (metals, superconductors, Hall fluids) and neutral systems (magnets, excitons). I demonstrate how structured light can generate topological excitations, including vortices in superconductors and skyrmions in magnets. I also discuss how quantum printing induces magnetization in quantum paraelectrics and strain-mediated magnetization in Dirac materials. Finally, I propose future applications, such as printing entangled photon states, creating entangled topological excitations, and discuss applications of quantum printing to light induced quantum turbulence in a charged fluid.

[1] Quantum Printing
arXiv:2509.16792

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