Nonlocal PDEs and Quantum Optics

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Abstract: Quantum optics is the quantum theory of the interaction of light and matter. In this talk, I will describe a real-space formulation of quantum electrodynamics with applications to many-body problems. The goal is to understand the transport of nonclassical states of light in random media. In this setting, there is a close relation to kinetic equations for nonlocal PDEs with random coefficients.

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