



ICFO Colloquium Series: Making Fluids and Solids from Light

JONATHAN SIMON

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12:00

ICFO Auditorium

Profile:

Jon Simon is an associate professor of Physics & Applied Physics at Stanford University. His group's work currently focuses on matter made of light and quantum information science, employing tools from atomic physics, cavity quantum electrodynamics, and (in collaboration with the Schuster Lab) circuit quantum electrodynamics. His interests range from quantum optics and strongly correlated matter to the theory of control, Brazilian jiu-jitsu, drones, and cats.

Abstract:

In this talk I will discuss recent results from a collaboration between the Simon & Schuster

labs where we have developed techniques for assembling quantum matter from strongly interacting microwave photons. Beginning with a description of the platform - an array of capacitively coupled transmon qubits acting as a Hubbard-regime lattice for photons - I will motivate the challenges associated with teaching photons to order into materials. From here, I will describe two experiments: (1) assembly of mott insulators by coupling to a non-markovian reservoir capable of cooling the system whilst simultaneously injecting particles; and (2) assembly of photon fluids by controlled introduction and removal of disorder + the ability to extend this technique to assembly of superpositions of superfluids - photonic cat states. I will conclude with prospects for assembly of topologically ordered matter, and a brief overview of our other collaborative efforts.

Hosted by: Leticia Tarruell