



## Physical Sciences Seminar

# Using electro-optic correlations to improve an efficient, microwave-mechanical-optical converter

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Host: Johannes Fink

Small mechanical resonators can mediate interactions between superconducting circuits and optical cavities. These systems could be used to convert quantum signals between microwave and optical frequencies, enabling long-distance optical connections between superconducting qubits. I will show that a microwave-mechanical-optical converter generates correlations which can be fed forward to correct the converter's own thermal-mechanical errors. Operating at the ultralow temperatures required for quantum electrical circuits, we demonstrate that this approach improves classical conversion, and obtain record noise performance and efficiency. I will also discuss how our approach can be adapted to transferring quantum states. The presence of correlations allows quantum information to be transferred even when it is impossible to optomechanically cool the mechanical resonator to its ground state.

**Wednesday, February 21, 2018 09:00am - 10:00am**

Big Seminar room Ground floor / Office Bldg West (I21.EG.101)



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