



Joint Quantum Sciences Seminar

Wednesday, April 18, 4:00 pm
Jefferson 250

Prof. Harold Baranger

Duke University

“Waveguide QED: Photon Correlations, Capture, and Production”

Strong coupling between a local quantum system (qubit) and one-dimensional bosonic states has recently become experimentally feasible in a variety of plasmonic, photonic, circuit-QED, and cold-atom contexts. This has opened up a new field dubbed "waveguide QED". The key ingredient in the many new effects in this area is inelastic scattering into the one-dimensional continuum. Using such inelastic scattering as a unifying theme, I shall discuss our results on (i) characterization of photon correlations using the waiting-time distribution, (ii) capture of a photon into a bound state in the continuum, and (iii) photon production when the coupling is ultrastrong. In the ultrastrong example, we find surprisingly that the off-resonant inelastic emission is dominated by broadband photon production, coming from contributions in which the number of excitations is not conserved.

Student Presentation by Yichao Yu will begin at 4:00 PM

Guest Presentation will begin at 4:30 PM

Refreshments will be provided