

**Abstract:**

Collisions of heavy ions at ultrarelativistic energies produce nuclear matter at extreme densities. At the point of impact, the nuclei's protons and neutrons melt into their constituents --- quarks and gluons --- which then evolve through a succession of complex states of nuclear matter. Throughout this evolution, a small fraction of the energy of this nuclear matter is radiated in the form of photons. Given their long mean-free-path in the system, these photons can be used to probe all the different stages of heavy ion collisions.

In this talk, I will review photon production in heavy ion collisions. I will summarize our understanding of the different stages of heavy ion collisions, and photon production from each one of them. I will discuss opportunities and challenges with both calculations and measurements of photon production.