

# **Niclas Westerberg**

**Heriot Watt University, Edinburgh**

Abstract: Recent progress in photonics has led to a renewed interest in time-varying media that change on timescales comparable to the optical wave oscillation time. However, these studies typically overlook the role of optical dispersion, an effect which by necessity implies a delayed temporal response or, alternatively stated, a memory. In this talk, I will discuss some recent work in which we studied the influence of the medium's memory on the excitation of quantum vacuum radiation due to temporal modulation. We find that the memory changes the vacuum emission properties drastically: Frequencies mix, something typically associated with nonlinear processes, despite the system being completely linear. Interestingly, this effect is related to parametric driving by frequencies present locally in the drive but not in its spectrum.