*Applied Physics & OSA*

*Optics Seminar*

# Combining Frequency-Comb-Synthesizers with Novel Coherent Sources in the Mid-IR:

## A Window for a New Generation of Photonic Tools


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***Abstract:***

A new class of IR coherent sources and IR frequency combs that combine optical frequency-comb synthesizers (OFCSs) and optical parametric up/down conversions are already available and this technology is still progressing at a very fast pace. Peculiar features in IR radiation produced by difference-frequency-generation (DFG) setups or quantum-cascade lasers (QCLs) can be achieved when they are phase and frequency controlled by the OFCS. Indeed, the output frequency is accurately known against the primary frequency standard and the linewidth is highly narrowed thanks to the transferred OFCS coherence even for laser sources whose frequencies are several THz apart. These features, together with their wide tunability and their small intensity fluctuations (down to the shot-noise limit), make these IR sources well suited for a wide range of applications.


***Brief Biography:***

Dr. Paolo De Natale joined the European Laboratory for Non Linear Spectroscopy (LENS) in 1988 and, since 1996, has been with the Istituto Nazionale di Ottica Applicata (INOA)-CNR, of which he is presently the director. Dr. De Natale has authored more than 150 papers and is co-inventor in 5 patents. His research interests include: nonlinear optics, laser physics, atomic and molecular spectroscopy, frequency metrology, environmental monitoring with optical devices, optical sensors and diagnostics, non-linear optical crystals and infrared coherent sources.

## *Wednesday August 20th*
## *4:00pm-5:00pm*
## *Watson 104*

*Refreshments will be available in the Watson Lobby at 3:45pm*