MATERIALS SCIENCE

UNIVERSITY OF ROME
TOR VERGATA

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G2C room
Sogene Building

Gallium Nitride and the solid state lighting revolution

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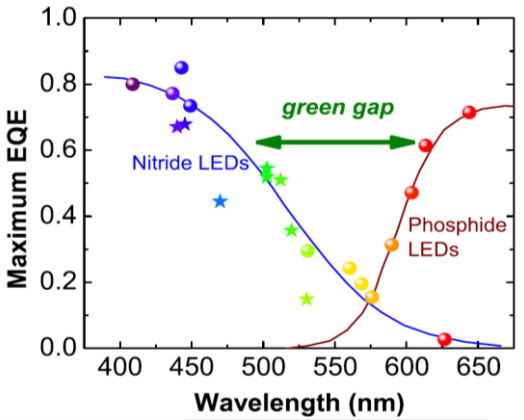
In this talk, I review the current state of art of GaN based LED describing, at the same time, advanced multiscale/Multiphysics simulation approaches to design and analyze such devices. In particular, I show by atomistic simulations that a consistent part of the green gap in c-plane InGaN/GaN-based LEDs may be attributed to a decrease in the radiative recombination coefficient with increasing indium content due to random fluctuations of the indium concentration naturally present in any InGaN alloy.[1] Moreover, I show that the current in InGaN/GaN single-quantum-well LEDs at low forward bias can be accurately described by a trap-assisted tunneling model.[2]



References:
[1]M. Auf der Maur et al. Phys. Rev. Lett. 116, 0274012 (2016)
[2]M. Auf der Maur et al. Applied Physics Letters 105, 133504 (2014);