



## Photodetector modeling @ CSM

14 June 2019, 10:30

Maxwell Conference Room, Corso Castelfidardo 42A

Prof. Enrico Bellotti will introduce the **Center for Semiconductor Materials & Devices Modeling** and will be available for discussing new possible collaborations with PoliTO researchers. Examples of CSM-sponsored activities will be presented in two talks.

- Dr. **Jonathan Schuster**, U.S. Army Research Laboratory, Adelphi, MD, USA

### Challenges in the numerical simulation of T2SL-based infrared focal plane arrays

At the center of any infrared imaging system is the detector pixel array (FPA), typically fabricated from HgCdTe, InGaAs or III-V type II superlattice (T2SL) materials. We will introduce the simulation techniques required to predict, understand, and benchmark the pixel array performance, and we will discuss the challenges involved in the present transition from bulk semiconductors to strongly anisotropic T2SLs, with special emphasis on the assessment of crosstalk mitigation strategies.

- **Ilya Prigozhin**, Department of Electrical and Computer Engineering, Boston University, USA

### MC3D: development of a 3D Monte Carlo simulator

We will describe the physical models employed to describe the material properties and will discuss the challenges associated with the calculation of the scattering rates, where an unstructured tetrahedral mesh is used in the discretization of the reciprocal space, in order to allow more freedom and finer refinement control. We will also cover the approach used to describe the real space device geometry and particle tracking, as well as the interface between different mesh generators. We will give a number of device examples to illustrate the ability of the code to analyze 3D devices. Lastly, we will consider the open problems that we are currently addressing.