Quantum dots on silicon platform: new approach of telecom light for sensing applications | 3YR	Start Date: December 1st, 2015
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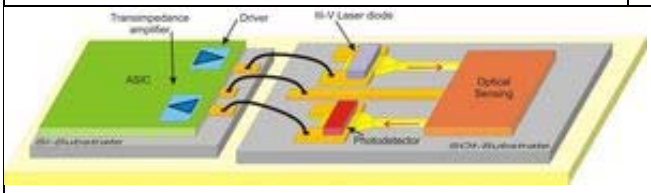

Abstract: Silicon is currently the dominant material for electronics, being well known, cheap and common. In the last decades, it is also imposing as platform for photonics. Several functionalities have been demonstrated and the only drawback is the lack of an efficient light source. One way to overtake that is integrating optically active III-V materials on the silicon chip or efficiently coupling light from the source to the chip. The current project has the goal of designing and fabricating sensing devices on the silicon platform. Light sources will be provided by efficient QD-based devices. In particular regard non-classical light generation, it has been demonstrated, in the framework of the project, the efficient single-photon emission at 1550 nm from In(Ga)As QDs [publications here]. For the first time, entangled photon generation from a QD has been proven at 1550 nm, showing very interesting perspectives in using such quantum light sources in combination with well-established silicon-based functionalities (i.e. light propagation and sensing). Currently under investigation is an efficient way to transfer via optical fiber these single photons to the silicon chip (for long distance applications) as well as the transfer of III-V material directly on a silicon chip.

Recent results:	Publications:
• *Single-photon emission at 1550 nm from In(Ga)As QDs, provided with a high quality Bragg mirror* • *First demonstration of entangled photon generation from a semiconductor QD at telecom wavelength* • *N. Witz, et al., talk at DPG (2017)*	**Single-photon emission at 1.55 µm from MOVPE-grown InAs quantum dots on InGaAs/GaAs metamorphic buffers,** M. Paul et. al., Appl. Phys. Lett. **111**, 033102 (2017) **Polarization-entangled photons from an InGaAs-based quantum dot emitting in the telecom C-band,** F. Olbrich, *et al., in press,* APL (2017) **AIP press release** *in press*

Further Collaborators:
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