

Optoelectronics of plasmonic/semiconducting low-dimensional nanomaterials

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About the Project

We aim to develop new concepts for optoelectronic devices based on photonic architectures and state-of-the-art nanomaterials such as colloidal nanocrystals and nanoparticles. One material class of great recent interest are low-dimensional semiconductor materials such as 2D layered perovskites. Based on a fundamental understanding of their optical and electrical properties, we will develop proof-of-concept devices for sensing, light emission, and signal processing.

The PhD candidate will work on time-resolved optical spectroscopy on these materials, their functionalization via surface chemistry and ion-exchange processes, and on nanofabrication of optical and electrical devices. We also aim to combine the nanomaterials with optical or plasmonic cavities for enhanced light emission and strong light-matter coupling.

The PhD position is hosted by Optoelectronics group (<https://www.iit.it/it/web/optoelectronics>) that is embedded in a highly stimulating and collaborative environment at the headquarters of the Italian Institute of Technology (IIT) in Genoa, Italy.

Requirements: The ideal candidate should have a degree in materials science, physics, chemistry or engineering, with a strong interest in the photophysics of nanomaterials and related device applications.

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