

# PhD Program in Science & Technologies of Chemistry & Materials

## **Curriculum Nanochemistry**

PhD in IIT Optoelectronics group

Title: Innovative nanocavities coupled to emissive nanomaterials for light-matter interaction

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### Description

We are investigating emerging nanomaterials for light emission and their integration into optical resonators to obtain nonlinear optical properties and emitting devices with novel functionalities. Towards the emitters we focus on low-dimensional metal-halide perovskites and colloidal nanocrystals that can be tailored for the compatibility with photonic cavities in size, emission wavelength and surface functionalisation. For the optical resonators we are interested metal-dielectric nanocavities and plasmonic nanosystems that can be realized either by self-assembly or top-down fabrication.

This PhD project will target the fabrication of the photonic cavities and explore different strategies for the integration of emitting nanomaterials, with the aim to discover novel approaches that can boost the performance of optoelectronic devices in light emission and photodetection.

We are looking for highly motivated candidates with a degree in Physics, Chemistry, Material Science, Engineering or Nanotechnology that are keen to work in an interdisciplinary environment. Experience in nanofabrication, optoelectronic spectroscopies, and theoretical modeling are considered as a plus.

Information on the activities of the Optoelectronics Group and related publications can be found at: <https://www.iit.it/it/web/optoelectronics>