

Research positions (Master-, PhD-, Postdoctoral-level):

Topological NanoPhotonics (ERC Consolidator)

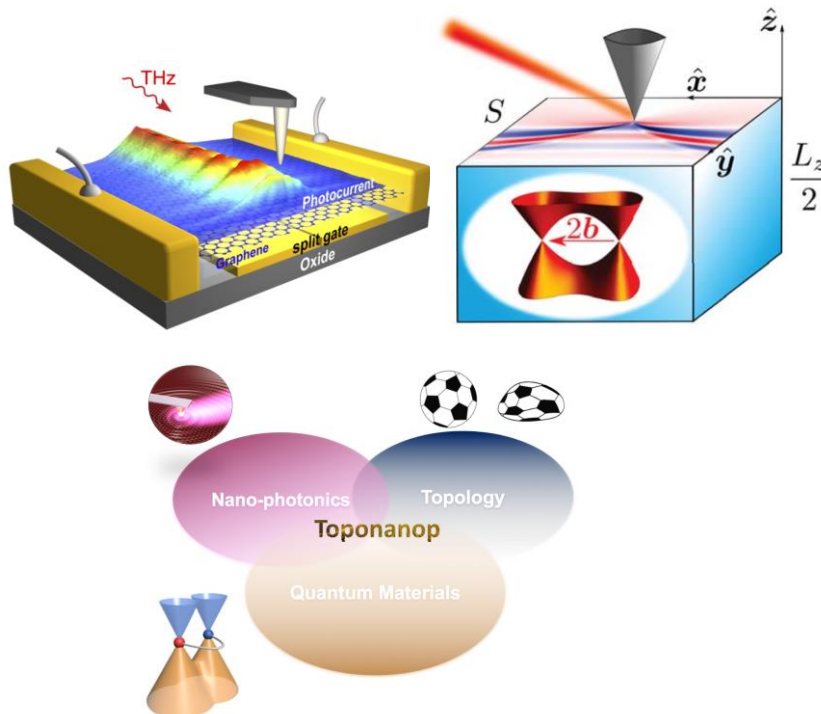
The Quantum Nano-Optoelectronics research group at ICFO, led by Prof. Dr. Frank Koppens, is looking for well-qualified, highly motivated and dynamic young graduates and scientists who wish to enhance his/her scientific career in a friendly and stimulating environment within the field of Topological NanoPhotonics.

The goal of this project is to exploit the extraordinary topological properties of novel quantum materials in order to control light at the nanoscale in a radically new way. Visualizing and controlling electromagnetic collective excitations (e.g plasmons) will be used as a tool to unravel extraordinary phenomena in exotic quantum materials. One of the objectives is to generate non-reciprocal nanoscale optical fields (plasmons) that propagate in only one direction and implement topological plasmons such that they move around defects and corners.

Various material systems will be explored, including heterostructures of 2d materials, gapped bilayer graphene, WTe2 and Weyl-Semimetals. We have access to unique measurement tools such as near-field microscopy with infrared and terahertz light. This project is at the interface of the three fields of quantum materials, nanophotonics and topology.

References:

- Quantum non-local theory of topological Fermi arc plasmons in Weyl semimetals. Arxiv 1706.06200
- Tuning quantum non-local effects in graphene plasmonics. Lundeberg et al., Science (2017)
- Thermoelectric detection and imaging of propagating graphene plasmons. Lundeberg et al., Nature Materials (2016)
- Ultra-confined acoustic THz graphene plasmons revealed by photocurrent nanoscopy. Alonso-Gonzalez et al., Nature Nanotechnology (2016)
- Real-space mapping of tailored sheet and edge plasmons in graphene nanoresonators. Nikitin et al., Nature Photonics (2016)



In case of interest, candidates may contact Prof. Dr. Frank Koppens (frank.koppens@icfo.eu) for further details.

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