

Optical properties of graphene nanopieces

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Graphene is a key material for nanoelectronics. Nevertheless, its zero gap makes it unsuitable for applications needing semiconductors with sizeable energy gaps. Therefore, a lot of efforts are being made to develop materials with non-zero gap compatible with the hexagonal lattice of graphene. In this framework, small pieces of graphene such as graphene nanoribbons and quantum dots have a lot of assets. Thanks to the so-called bottom-up synthesis a precise control of the size, shape and edges of these objects is achievable [1]. This opens the way to a precise tailoring of their physical properties.

In this presentation, I will first present the different research topics of the group. Then I will show our recent results on the optical properties of both graphene nanoribbons and quantum dots synthesized by bottom-up chemistry [2-4].

References:

[1] R. Rieger and K. Müllen, "Forever young: polycyclic aromatic hydrocarbons as model cases for structural and optical studies", *J. Phys. Org. Chem.* 23, 315-325 (2010).

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[3] Shen Zhao *et al*, "Fluorescence from graphene nanoribbons of well-defined structure" *Carbon* 119, 235 (2017)

[4] Shen Zhao *et al*, "Single photon emission from graphene quantum dots at room temperature", in preparation