18èmes Journées de la Matière Condensée
22-26 août 2022, Lyon

Société Française de Physique

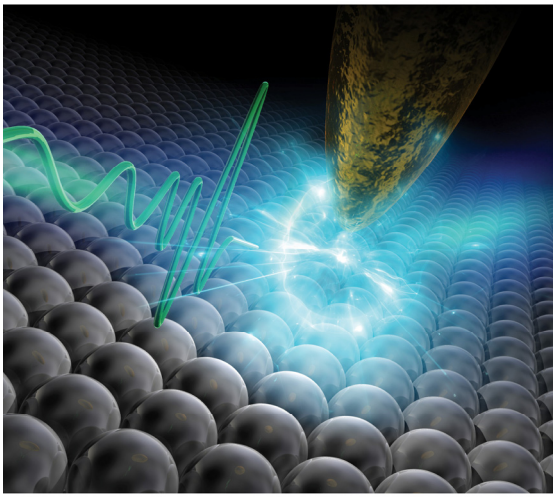
Titre: Light-matter interactions below the tip

1. **Organisateurs :**
Natalia Alyabyeva (LPMC, Ecole Polytechnique), natalia.alyabyeva@polytechnique.edu
Eric Le Moal (ISMO, Université Paris-Saclay), eric.le-moal@universite-paris-saclay.fr
Guillaume Schull (IPCMS, Université de Strasbourg), guillaume.schull@ipcms.unistra.fr

2. **Parrainage ou lien avec des sociétés savantes, des GDR ou autres structures**
RéMiSol - Réseau Microscopies à Sondes Locales.
GDR NS-CPU - Nanosciences with near-field microscopy under ultra-high vacuum
SFP - Société Française de Physique

3. **Résumé de la thématique du minicolloque :**

Since scanning probe microscopy techniques (STM and AFM) were invented in the 80's, they have proved to be powerful tools for probing local properties at surfaces (topography, electronic density of states, charge and spin state, electron transport, vibrational states, magnetic or mechanical response, etc…),[1] with the possibility to manipulate individual molecules or atoms.[2,3] Among the many related microscopy methods that have been developed over the years, the ability to perform optical spectroscopy measurements with atomic-scale spatial resolution by collecting photons emitted at (or close to) the tip-surface junction has open a wide field of investigation, from the photo-physical properties of individual molecules[4] to the optoelectronic processes in quantum structures.[5,6]



Luminescence via inelastic electron tunneling
Reproduced with permission of ACS Photonics.
Cover image: 21 April 2021, Volume 8, Issue 4.

The present mini-colloquium aims to gather the scientific community interested in the study of light emission processes at nanometer scales using scanning probe microscopy techniques (scanning tunnelling luminescence, spin-polarized STM, tip-enhanced techniques as photoluminescence, Raman, second harmonic generation, etc…). The numerous teams involved in different organizations such as RéMiSol, the GDR NS-CPU, the GdR ondes will be welcome to participate and present their recent studies in this field. The scientific exchanges during this mini-colloquium will contribute to the emergence of new directions in nanophotonics and optoelectronics.

[1]B. Bhushan, Springer NanoScience and Technology book (2010).
[2]F. Mohn et al., Nat. Nanotech. 7**,** 227 (2012).
[3]N. Pavliček et al., Nat. Chem. 10 (2018).
[4]B. Doppagne et al., Nature Nanotechnol. 15, 207 (2020).
[5]W. Hahn et al., Phys. Rev. B 98, 045305 (2018).
[6]D. Pommier et al., PRL123, 027402 (2019).