

Axis 3 : Optical, excitonic and photonic properties

GDR *HOWDI* : annual meeting, March 2021



Claudio Attaccalite
(Aix-Marseille Univ.)



Guillaume Cassabois
(Montpellier Univ.)

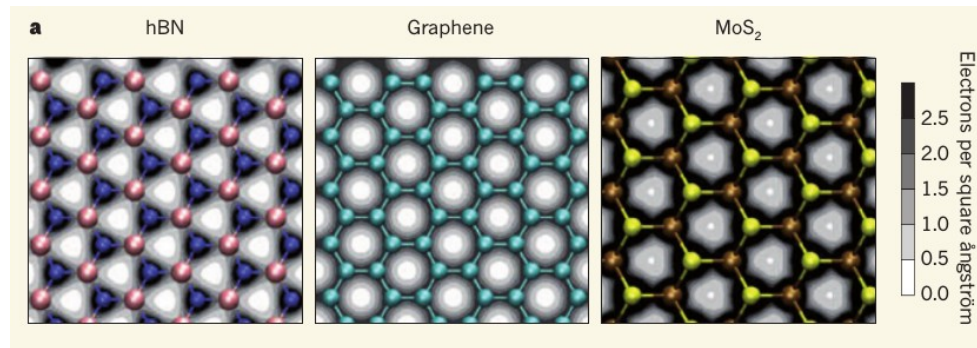


Cédric Robert
(INSA-Toulouse)

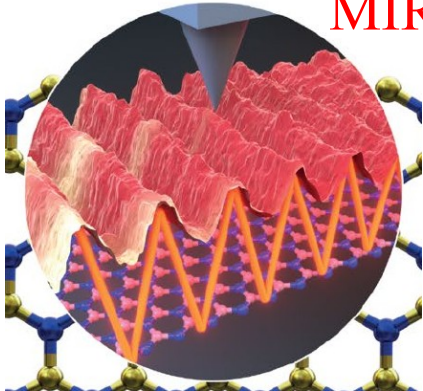


Bernhard Urbaszek
(INSA-Toulouse)

The rise of 2D materials

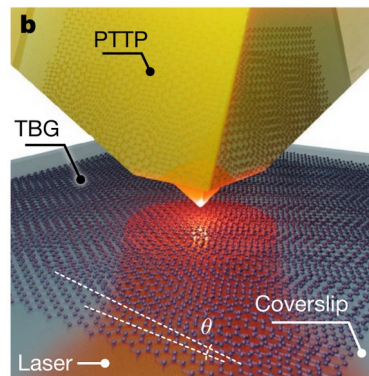


- ◆ Luminescence UV
- ◆ Phonon-polaritons MIR

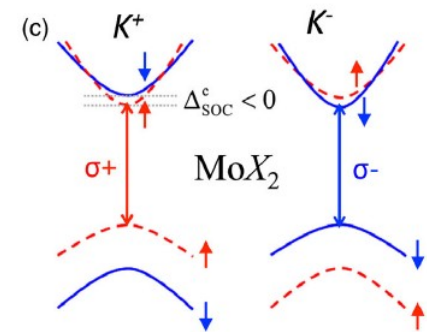


Nat.Rev.Mat. (2019)

- ◆ Raman scattering
- ◆ THz spectroscopy

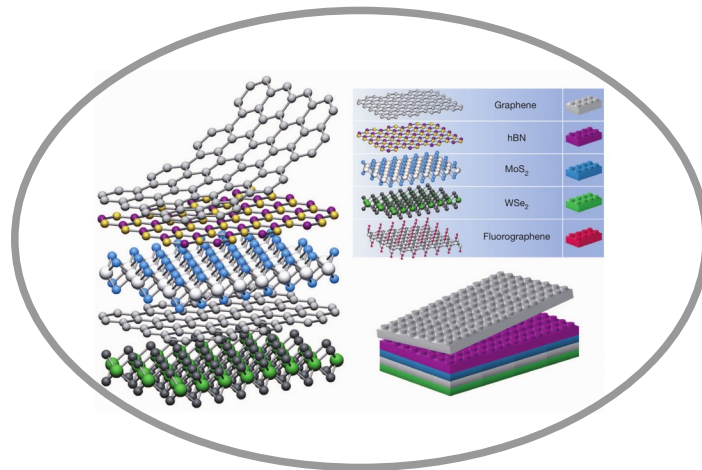


- ◆ Luminescence VIS
- ◆ Opto-valleytronics



Rev.Mod.Phys. (2018)

From 2D materials to 2D heterostructures



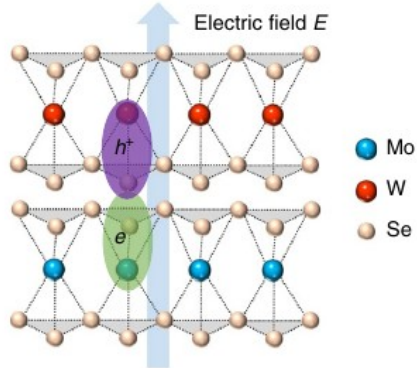
Nature (2013)

From 2D materials to 2D heterostructures

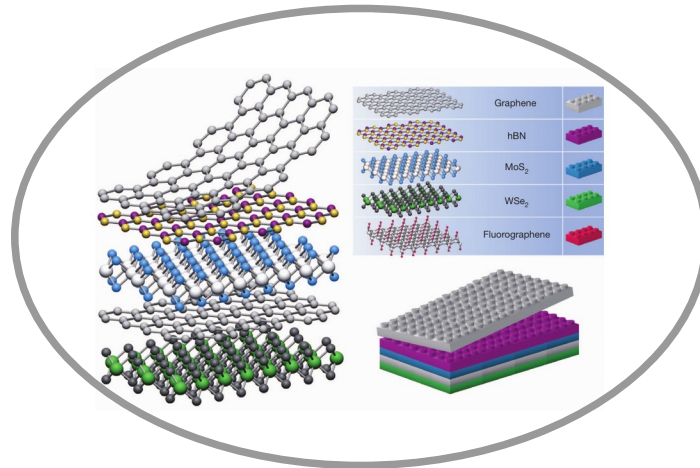
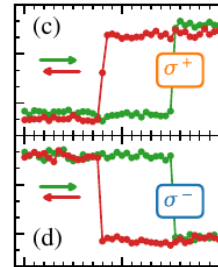
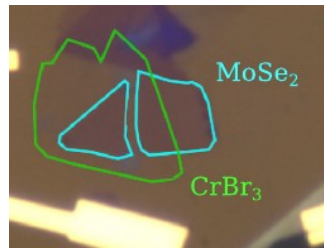
Proximity effects

Hot topic 1

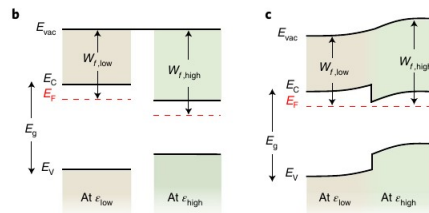
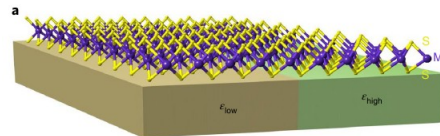
Interlayer excitons



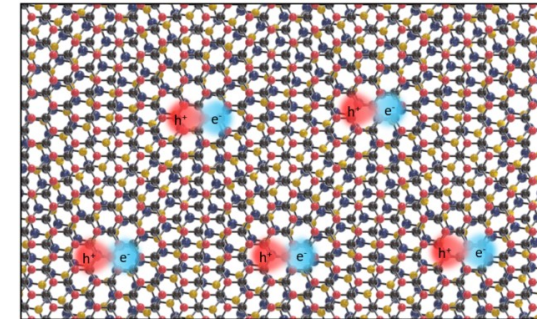
Towards collective effects (BEC...)



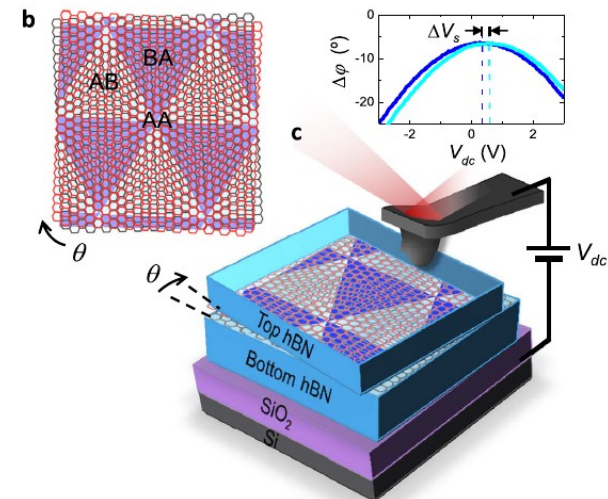
Lateral heterostructures



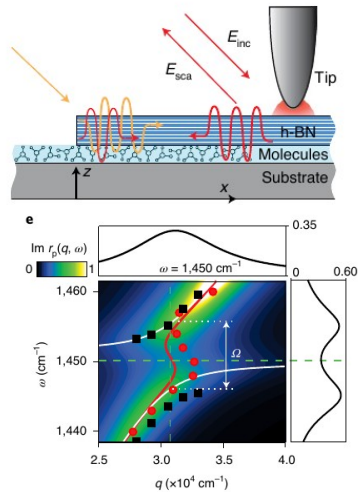
Twistronics



Ferroelectricity

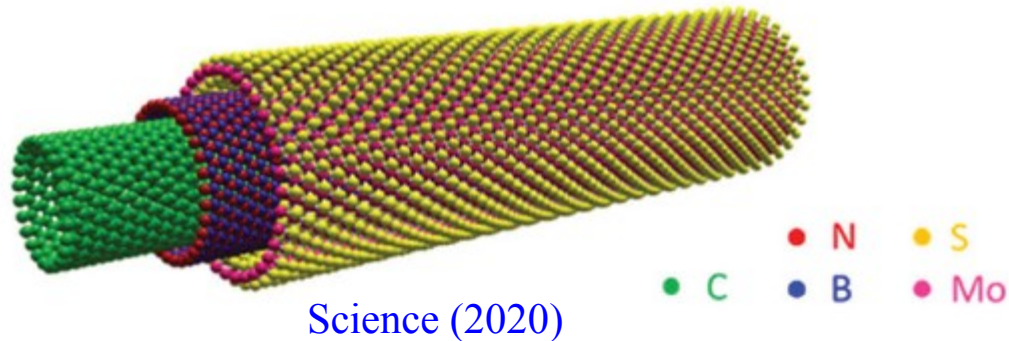


Strong coupling



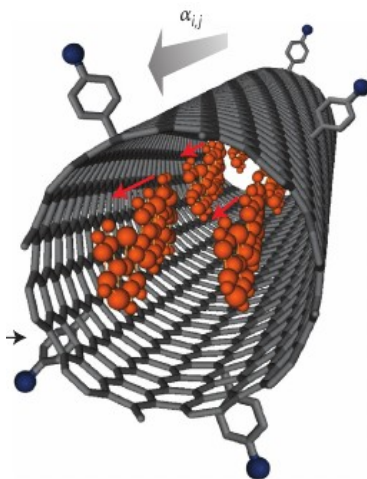
Beyond 2D heterostructures

- 1D vdW heterostructures

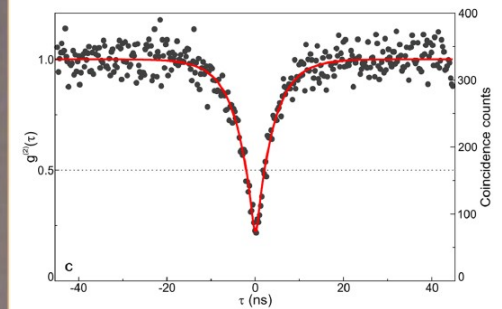
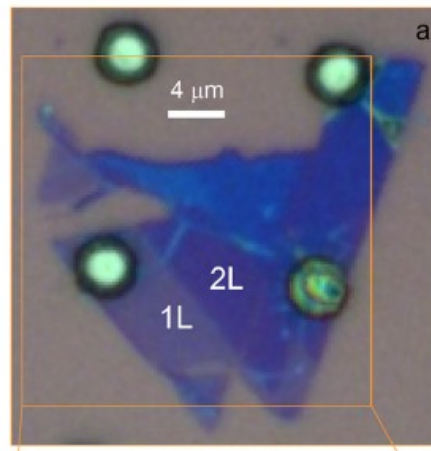


- Hybrid dimensionality

0D/1D



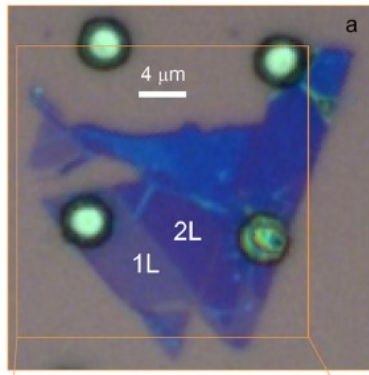
0D/2D



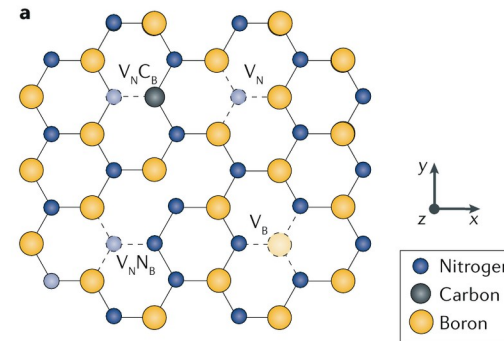
Quantum technologies

Single photon sources

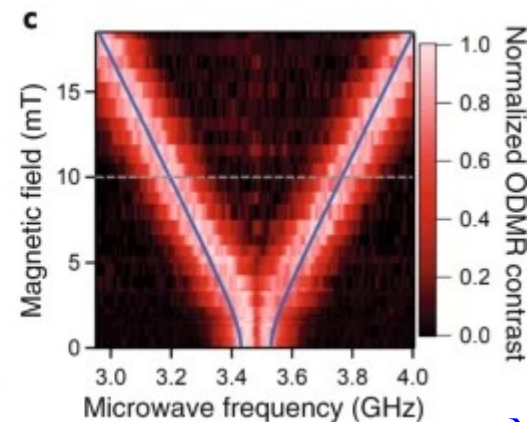
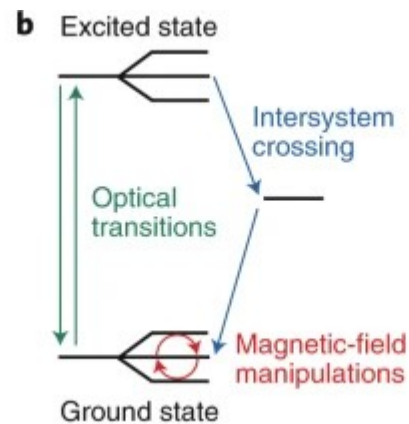
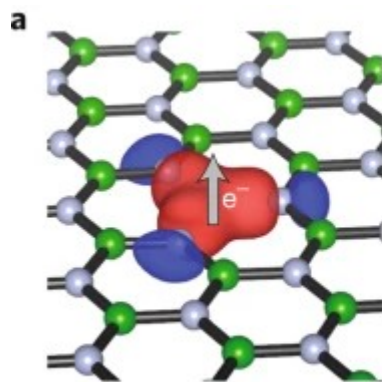
Localized excitons



Point defects

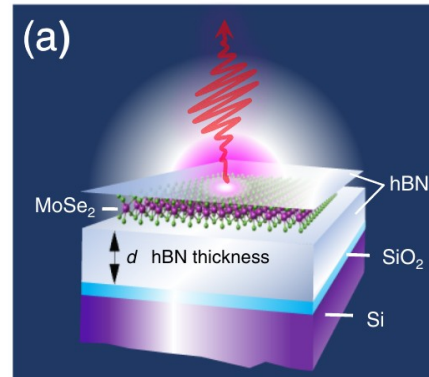
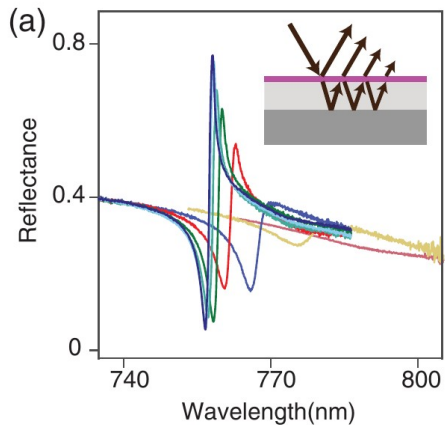


Towards spin-photon interfaces

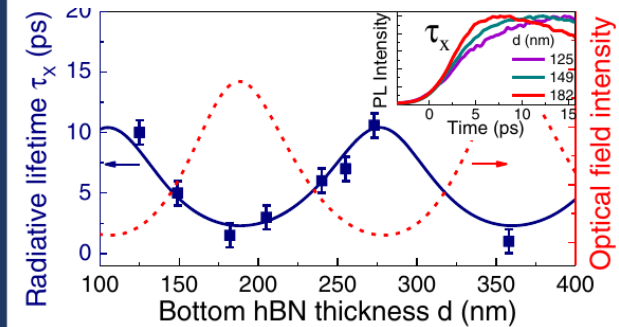


vdW heterostructures & nanophotonics

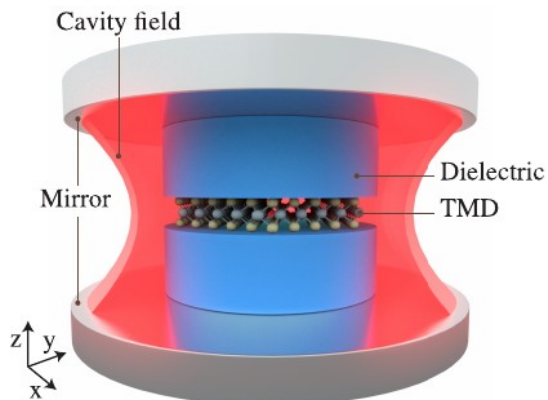
Perfect mirror



Purcell effect

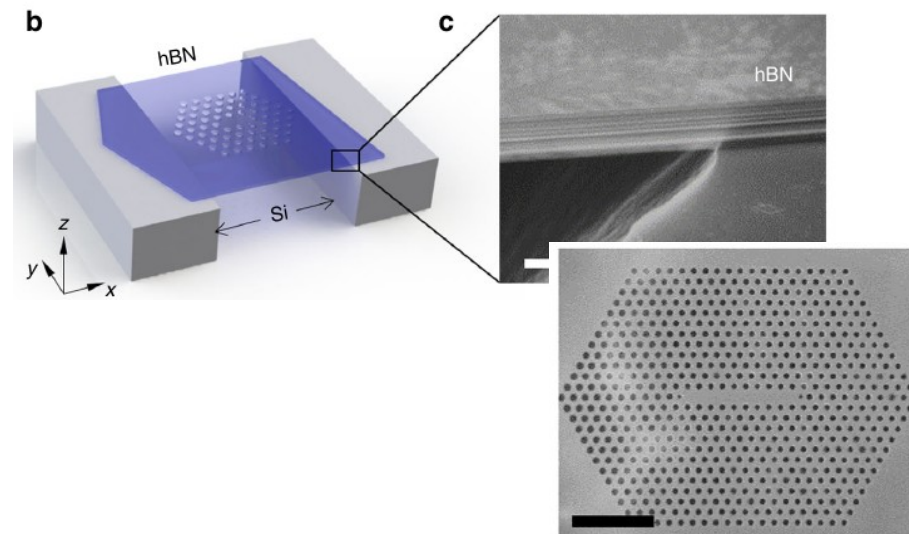


Cavity-polaritons



**Strong coupling
@ room temperature**

Photonic crystals



Hot topic 1 : Magneto-optics in vdW heterostructures

Hot topic 2 : Recent theoretical developments