Minicolloque n° MMPS28 **X Oral** ☐ **Poster**

Pushing Absorption of Perovskite Nanocrystals into the Infrared

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To date defect-tolerance electronic structure of Lead halide perovskite nanocrystals is limited to optical feature in the visible range. Here, we demonstrate that IR sensitization of formamidinium lead iodine (FAPI) nanocrystals array can be obtained by its doping with PbS nanocrystals. In this hybrid array, absorption comes from the PbS nanocrystals while transport is driven by the perovskite which reduces the dark current compared to pristine PbS. In addition, we fabricate a field-effect transistor using a high capacitance ionic glass made of hybrid FAPI/PbS nanocrystal arrays. We show that the hybrid material has an n-type nature with an electron mobility of 2 x 10-3 cm^2 $V^{-1}s^{-1}$. However, the dark current reduction is mostly balanced by a loss of absorption. To overcome this limitation, we couple the FAPI/PbS hybrid to a guided mode resonator, that can enhance the infrared light absorption.

[1] P. Rastogi t al, Nano letters 20, 3999 (2020)
[2] D. Amelot t al, J. Physical Chemistry C 124 , 3873 (2020)