Integration of graphene based photodetectors and imagers for broadband sensing

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Graphene based light sensors [1,2] are inherently flexible and transparent and can be integrated with low-cost CMOS technology [3], hence providing a disruptive platform for future wearables (figure 1) and (hyperspectral) imaging devices (figure 2).

Improvements in the maturity of graphene transfer and device integration are key for achieving better performing prototypes and moving the technology closer to product level. We will discuss achievements and challenges in fabrication and integration for image sensors and wearables.

We will also show recent developments on prototypes based on graphene- colloidal quantum dot hybrid photo detectors ($D^*>10^{12}$ Jones for 300-2000 nm, <1ms time response) for wellness sensing and imaging applications.

References

[1] G. Konstantatos, et al., Nature Nanotechnol., 7 (June 2012)
[2] Nikitskiy et al., Nat. Commun., 7 (June 2016)
[3] Goossens et al., Nat. Phot. 11 (June 2017)

Figures

Figure 1 Artist impression of graphene and 2D material based patch for monitoring personal wellbeing.

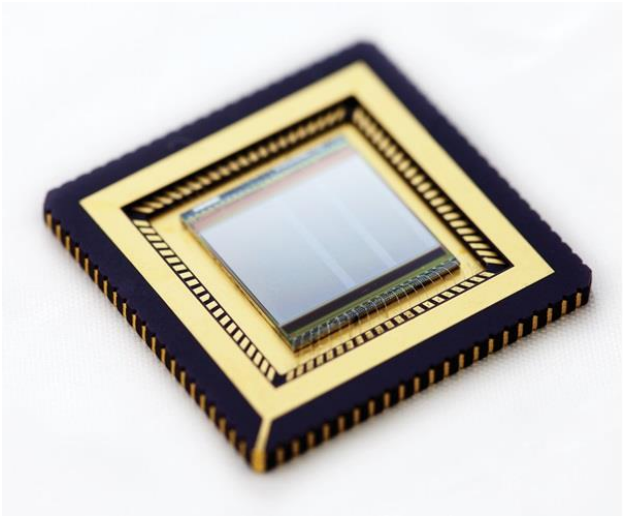

Figure 2: CMOS-integrated graphene based image sensor [3]