Perspectives and challenges in printable and flexible electronics based on two-dimensional materials

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The extraordinary mechanical and electrical properties shown so far by graphene and related two-dimensional materials (2DMs), are pushing their exploitation towards new direction and applications [1-3].
Printable and flexible electronics is one the field where 2DMs could be the game changer, and they could represent much needed enabling technology in order to reach the desired goal of obtaining distributed systems with various functionalities on flexible and wearable substrates.

In this talk, I will discuss the points of strength of this technology, and I will highlight the weaknesses and the problems that still need to be solved, while trying to provide an overview of the perspectives and challenges that have to be tackled.

REFERENCES

[1] Silvia Conti, Lorenzo Pimpolari, Gabriele Calabrese, Robyn Worsley, Subimal Majee, Dmitry K Polyushkin, Matthias Paur, Simona Pace, Dong Hoon Keum, Filippo Fabbri, Giuseppe Iannaccone, Massimo Macucci, Camilla Coletti, Thomas Mueller, Cinzia Casiraghi, Gianluca Fiori, Nature Communications, 11, 3566, 2020.
[2] Dmitry K Polyushkin, Stefan Wachter, Lukas Mennel, Matthias Paur, Maksym Paliy, Giuseppe Iannaccone, Gianluca Fiori, Daniel Neumaier, Barbara Canto, Thomas Mueller, Nature Electronics, 3, 486, 2020
[3] Yury Yu Illarionov, Theresia Knobloch, Markus Jech, Mario Lanza, Deji Akinwande, Mikhail I Vexler, Thomas Mueller, Max C Lemme, Gianluca Fiori, Frank Schwierz, Tibor Grasser, Nature Communications, 11, 3385, 2020

FIGURES

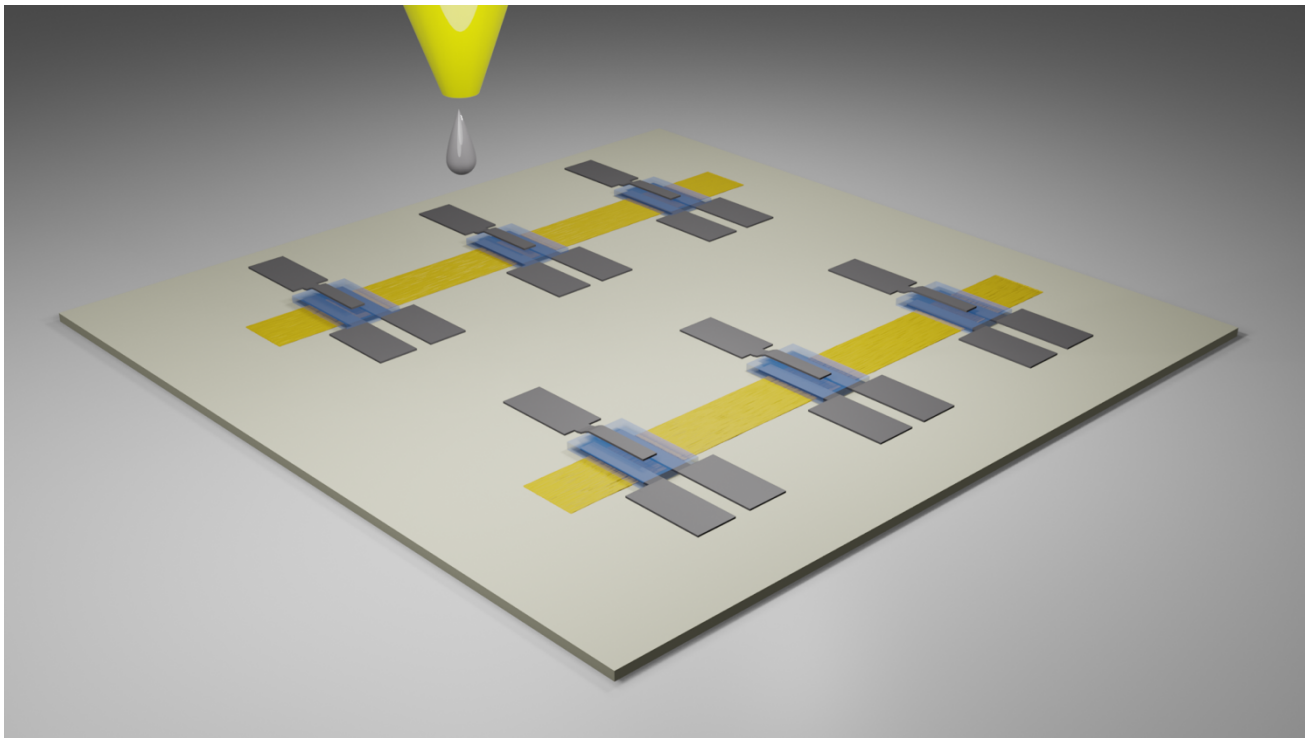

Figure 1: Sketch of printed devices on a flexible substrate