

Molecular 2D materials for electronic and photonic applications

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During the last years, *molecular 2D materials* are coming more and more in focus of the 2D materials community. The first reported material of this class are Carbon Nanomembranes (CNMs). These molecular nanosheets are synthesized via electron irradiation induced cross-linking of aromatic self-assembled monolayers (see reviews [1-2]). In this talk I will report on recent advances on the atomistic understanding of this synthetic route and on new classes of CNMs with variable chemical functionality [3-5]. Moreover, I will present some examples of implementation of individual CNMs and their van der Waals heterostructures with various inorganic 2D materials (graphene and transition metal dichalcogenides) in functional nanostructures, field-effect devices, nanosensors, photonic metasurfaces and photocatalytic nanomembranes [6-9].

References

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Figures

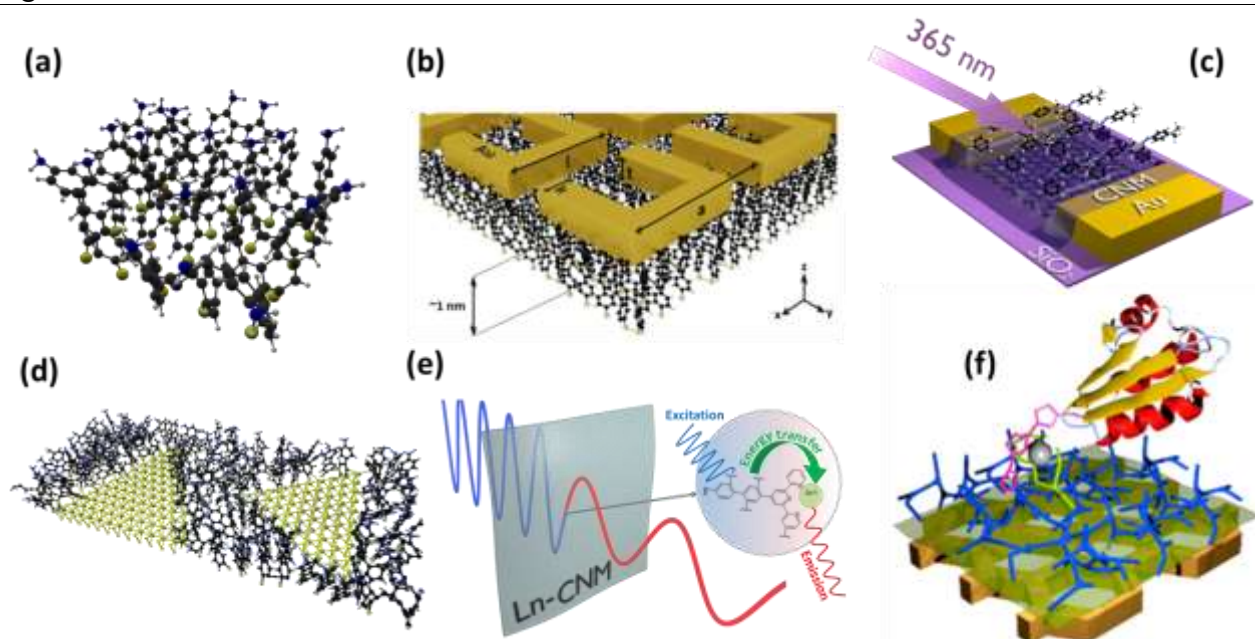


Figure 1: Carbon Nanomembranes (CNMs) and their implementation in functional nanostructures and devices: (a) Bifacial 1 nm thick CNM with functional amino and thiol groups; (b) 1 nm thick CNM as an “invisible” support for photonic metasurfaces; (c) Non-destructive functionalization of graphene FETs, (d) Lateral CNM-TMD heterostructure; (e) Photocatalytic CNM, (f) Biofunctional CNM.