Phase **Re**trieval and Spectroscopy of Atoms and Molecules in/on **Gr**aphene by **A**dvanced Electron **M**icroscopy -- **PReGrAM --**

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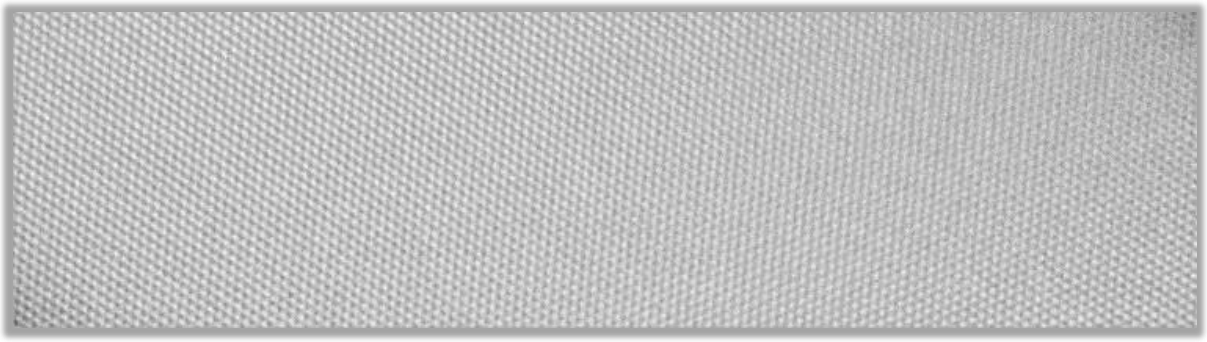
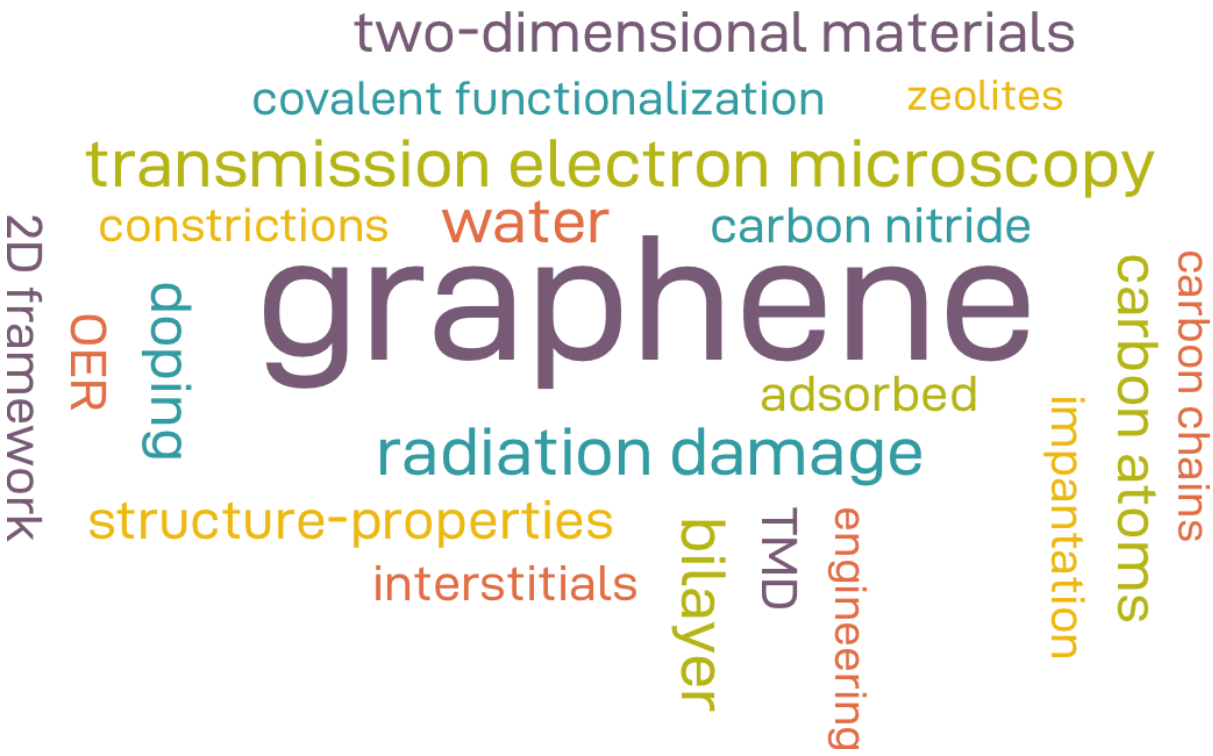


The aim of PReGrAM is to image and quantify the local atomic and electronic structure, and electrostatic fields of functionalized graphene using advanced transmission electron microscopy techniques. This means, determining the position and species of every atom, and mapping the electrostatic potential in the of the carbon atoms of graphene and the functional species in/on graphene, thus enabling a quantitative understanding of the structure and property of each functionalization site separately, and how each of them contributes to the overall properties of the material. Specifically, graphene doped with interstitial atoms and with surface functional species is to be characterised using electron holographic techniques, complemented by analytical electron microscopy techniques.

Our proposed research will deliver a more detailed understanding about the change of the structure and properties of graphene by its functionalization. Additionally, our experimental strategy will lead to an integrated characterization methodology in the field of electron microscopy applied primarily but not exclusively on two-dimensional and radiation sensitive materials.



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