Two-dimensional (2D) heterostructures comprising hexagonal boron nitride (h-BN) and graphene are promising for applications in atomically thin electronic and sensing devices. However, their potentially scalable fabrication via van der Weals epitaxy (vdWE), in which the 2D layers are grown on top of each other, is inhibited by the inert nature of graphene, where an inhomogeneous nucleation of h-BN results in clustering and island formation. Hence, the control over the nucleation location is considered as a key challenge for a scalable fabrication of 2D heterostructures via vdWE. The aim of this project is to engineer chemically active defects in well-defined epitaxial graphene (EG) on SiC via focused ion beam to form stable nucleation sites during vdWE of h-BN. Preliminary results already demonstrated an unprecedented control over the nucleation location on granhene, with the possibility to control the h-BN formation via ion beam parameters. Based on the respective expertise of the project partners, we will study in theory and experiment the complex interactions between ion beams of various noble gases and granhene, to gain a fundamental understanding of the defect formation in EG with the goal to optimize the nucleation of h-BN for device implementation. We will not only control the nucleation location but also manipulate the defects by post-processing and study the coalescence of h-BN islands in-between the defective nucleation centers to form continuous 2D heterostructures. Ultimately this will allow the reproducible formation of graphene/h-BN heterostructures, which will be tailored into devices through appropriate placement of electronic contacts, e.g. excluding the artificial defects in the device area. The knowledge gained in this project will be based on experimental and computational characterization and will provide insight into defect formation and functionalization in graphene, which can also be extended to other 2D materials and to wafer scale.