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### **Dopants in Chemically Doped Monolayer Graphene**

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In monolayer graphene, substitutional doping during chemical vapor deposition (CVD) growth can be used to alter the electronic properties of graphene. To gain full understanding of such chemically doped monolayer graphene, it is essential to learn how the dopants distribute from at atomic scale up to at micron-meter scale, how the dopants modify the electronic structures of the graphene, and how the quasiparticles in graphene behave in the vicinity of the dopants. We use Scanning Tunneling Microscopy/Spectroscopy (STM/S), Micro-Raman spectroscopy, and X-ray absorption spectroscopy to address these questions. In this presentation, we will first show both Nitrogen and Boron atoms dope graphene in the graphitic form, and contribute electron and hole carriers into graphene respectively. Secondly, we will discuss the nature of inter-valley and intra-valley scattering in Nitrogen doped graphene due to the presence of graphitic Nitrogen dopants. Finally, we will show that Nitrogen dopants show sub-lattice clustering and avoid structural features such as domain boundaries of a graphene polycrystal.