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**Functionalizing graphene by embedded boron clusters** ALEXANDER QUANDT, Ernst Moritz Arndt University of Greifswald, Germany, JENS KUNSTMANN, Dresden University of Technology, Germany, CEM OZDOGAN, Cankaya University, Ankara, Turkey, HOLGER FEHSKE, Ernst Moritz Arndt University of Greifswald, Germany — We present results from an ab initio study of B<sub>7</sub> clusters implanted into graphene [1,2]. Our model system consists of an alternating chain of quasiplanar B<sub>7</sub> clusters. We show that graphene easily accepts these alternating B<sub>7</sub>-C<sub>6</sub> chains and that the implanted boron components may dramatically modify the electronic properties. This suggests that our model system might serve as a blueprint for the controlled layout of graphene based nanodevices, where the semiconducting properties are supplemented by parts of the graphene matrix itself, and the basic metallic wiring is provided by alternating chains of implanted boron clusters. [1] A. Quandt, C. Özdoğan, J. Kunstmann, and H. Fehske, *Nanotechnology* **19**, 335707 (2008). [2] A. Quandt, C. Özdoğan, J. Kunstmann, and H. Fehske, *phys. stat. solidi (b)* **245**, 2077 (2008).

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