



Universiteit
Leiden
The Netherlands

Unconventional fabrication of 2D nanostructures and graphene edges

Bellunato, A.

Citation

Bellunato, A. (2018, December 11). *Unconventional fabrication of 2D nanostructures and graphene edges*. Retrieved from <https://hdl.handle.net/1887/67524>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/67524>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/67524> holds various files of this Leiden University dissertation.

Author: Bellunato, A.

Title: Unconventional fabrication of 2D nanostructures and graphene edges

Issue Date: 2018-12-11

Stellingen

Accompanying the thesis:

Unconventional Fabrication of 2D Nanostructures and Graphene Edges

- 1- Carbon atoms on the edge of graphene represent a singularity. In fact, these atoms are already located on ruptures of the lattice of graphene, introducing scattering and perturbations in the band structure of graphene. (Chapter one of this thesis).
- 2- We overcome the requirements of atomic scale characterizations, clean rooms, and complex designs, targeting a single line of carbon atoms performing experiments at the macroscopic scale and with simple tools available in almost any chemical laboratory. (Chapter one of this thesis).
- 3- The presence of edges and defects in graphene promote new possibilities to tailor the chemistry of graphene with additional implications on the physical and electrical properties of graphene. (Chapter two of this thesis)
- 4- The selective functionalization of the edge of graphene aims to target the chemically active carbon atoms on the edge without interfering with the sp^2 honeycomb structure of the surface of graphene. (Chapter three of this thesis).
- 5- Despite a series of promising first and conceptual results, the widespread use of graphene encountered a series of bottlenecks. (Chapter eight of this thesis).
- 6- The tuneability of the gap is relevant for applications of such junctions, especially in the fields of single-molecule characterization, biosensing, and DNA sequencing. (Chapter four of this thesis)
- 7- The fabrication of nanostructures for large electric-field enhancements has become increasingly attractive over the last several years due to outstanding performance in applications of sensing and imaging. [Zhou, Z., et al., From 1D to 3D: Tunable Sub-10 nm Gaps in Large Area Devices. *Advanced Materials*, 28(15), 2956–2963.]
- 8- It is not a question of if, but a question of how many applications will graphene be used for, and how pervasive will it become. [A. Ferrari, et al., *Nanoscale*, 2015, 7, 4598–4810].
- 9- Using the number of publications, and the impact factors as the main criterion of evaluation of a PhD and a scientific career often don't reward the smartest, nor the bravest, but rather the luckiest.
- 10- The human experience and growth during a PhD are far more valuable than its scientific outcome.

