

# Towards wafer-scale fabrication of graphene based electronic, photonic and sensor devices

Daniel Neumaier<sup>1</sup>

<sup>1</sup> AMO GmbH, Otto-Blumenthal-Str. 25, Aachen, Germany

neumaier@amo.de

Graphene based electronic, photonic and sensor devices have attracted significant interests because of their outstanding properties. However, for commercialization of these devices the large volume production, i.e. wafer-scale processing, needs to be solved. While wafer scale growth of graphene and related 2D materials has been demonstrated by means of chemical vapor deposition or similar methods, the transfer of such grown 2D layers to target substrates still faces severe challenges related to contamination, mechanical stress and reproducibility. In addition, defining and controlling quality, yield and reproducibility of (opto-)electronic devices is at a very early stage.

In this presentation I will discuss approaches, challenges and possible solutions for the wafer scale integration of graphene based electronic and photonic devices. The performance of such devices will be compared to chip scale production and the current limitations for yield, device to device variation and reproducibility will be discussed.

## References

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- [2] G Ruhl et al. *The integration of graphene into microelectronic devices*. Beilstein Journal of Nanotechnology 8 (1), 1056-1064 (2017).
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## Figures

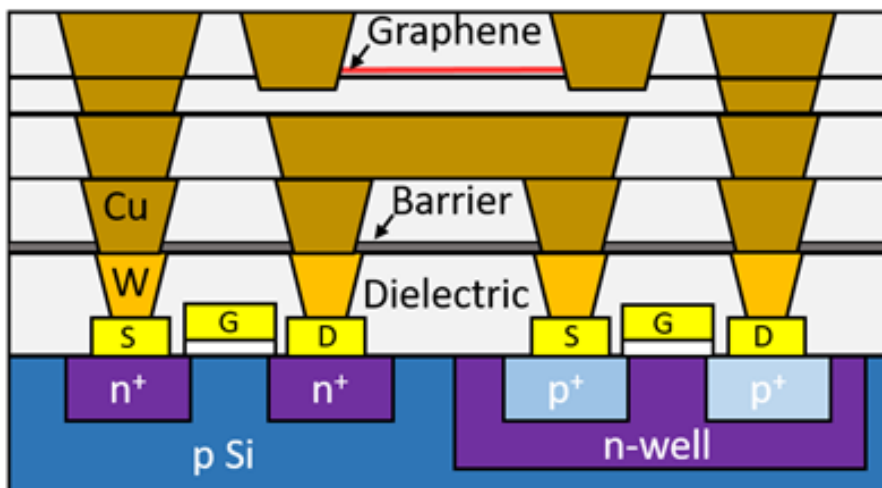


Figure 1. Possible integration scheme of graphene into a silicon CMOS platform at the back-end-of-the-line, as it could be used for graphene based Hall Sensors.