

University of Groningen

## Spin Transport and Proximity-Induced Magnetism in Graphene-Based van der Waals Structures

Leutenantsmeyer, Johannes Christian

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*

Publisher's PDF, also known as Version of record

*Publication date:*

2018

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Leutenantsmeyer, J. C. (2018). *Spin Transport and Proximity-Induced Magnetism in Graphene-Based van der Waals Structures*. Rijksuniversiteit Groningen.

### Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

### Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

*Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.*

# Propositions

accompanying the dissertation

## Spin Transport and Proximity-Induced Magnetism in Graphene-Based van der Waals Structures

1. The combination of different two-dimensional materials allows the creation of heterostructures with novel properties. The key challenge to bring this platform towards application is to realize devices reliably on a wafer-scale. (This thesis)
2. Spin transport is the most accurate technique to characterize small energy scales in the band structure of graphene. (Chapters 4, 5 and 7)
3. A discrepancy of three orders of magnitude between theory and experiment emphasizes the relevance of modeling the actual device structure in *ab initio* calculations. (Chapters 4, 5 and 7)
4. Reliable tunnel barriers are vital for all kinds of spin transport experiments in graphene. They can be realized by using two or three monolayers of the two-dimensional insulator hexagonal boron nitride. (Chapters 5 – 7)
5. The coupling between the spin and valley degree of freedom in pristine bilayer graphene results in spin-lifetime anisotropies comparable to TMD/graphene heterostructures. However, bilayer graphene has two orders of magnitude larger spin-lifetimes. This unique combination makes bilayer graphene an appealing platform for spintronic applications. (Chapter 7)
6. In hindsight, you can find countless reasons why your well-designed experiment did not work. However, it is more efficient to foresee why it actually could work. (Chapter 6)
7. Lab discipline is vital since the sloppiest person determines the reliability of all processes with shared equipment.
8. Speaking the same language is a necessary but not sufficient condition for efficient communication.
9. Success in (PhD student)life is not just a matter of luck but also of seizing opportunities.
10. No individual is perfect, but a team can be.

J.C. Leutenantsmeyer