

Propositions

accompanying the dissertation

Optically addressable spins in silicon carbide and related 2D materials: the effect of symmetry and spin-orbit coupling

1. Although scientific intuition is very valuable, it needs to be reassessed often. For example, spin-orbit coupling is generally expected to hinder the stability of localized electron spins, since it couples spin and spatial degrees of freedom. This is not always true, and spin-orbit coupling may lead to highly stable electronic-spin states if these have a well-defined preferred direction for the orbital angular momentum (Chapters 2, 3 and 7).
2. Symmetry is one of the most important factors determining the properties of defects in semiconductors. Care must be taken when ascribing experimentally observed behavior to a lowering of symmetry. More often than not, the same behavior can be explained by symmetry-compatible models that actually provide a better understanding of the physical mechanisms at play (Chapters 5 and 6).
3. Like a physical model, a good scientific figure should be concise and clean, and limit itself to the information necessary for understanding the intended message. Unnecessary embellishment that appeases to commercial editorial expectations often ends up being distracting from a scientific point of view.
4. The main goal of a PhD thesis as a booklet beyond peer-reviewed publications is to facilitate the continuation of work by both graduate and undergraduate students. As such, it should be written in an educational way.
5. The most important contribution of Academia to society is the development of human resources capable of assessing facts and ideas critically. Considering this, increasing the diversity of contributors (not only gender diversity but also of nationalities, ethnicities, races, etc.) is the most pressing issue currently facing academic institutions.
6. A better understanding of the trans-national societal crisis of the current age would arise from contextualization of European history within a worldwide scenario, instead of the other way around. To this end, cultural, academic, and educational institutions should critically revisit terms such as *The Dutch Golden Age*.
7. Several international research funding agencies currently require collaboration with industrial partners. Considering propositions 5 and 6, it makes at least as much sense to require collaboration with partners from developing regions.
8. The existence of billionaires is evidence of and further contributes to the erosion of democratic social structures since it creates a fictitious sense of national economic wealth while reinforcing long-standing class-based power relations.
9. "All models are wrong. Some are useful." – My dad, but before him, George Box.
10. A little bit of intuition about symmetries and their consequences goes a long way (this thesis).

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