

## Superconducting proximity and confinement in a two-dimensional electron gas

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**DOI**

[10.4233/uuid:41f57e3e-4163-4fdc-997f-f4f4b1e8fde1](https://doi.org/10.4233/uuid:41f57e3e-4163-4fdc-997f-f4f4b1e8fde1)

**Publication date**

2025

**Document Version**

Final published version

**Citation (APA)**

Kulesh, I. (2025). *Superconducting proximity and confinement in a two-dimensional electron gas*. [Dissertation (TU Delft), Delft University of Technology]. <https://doi.org/10.4233/uuid:41f57e3e-4163-4fdc-997f-f4f4b1e8fde1>

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# **Propositions**

accompanying the dissertation

## **SUPERCONDUCTING PROXIMITY AND CONFINEMENT IN A TWO-DIMENSIONAL ELECTRON GAS**

by

**Ivan Pavlovich KULESH**

1. The absence of the voltage bias effect on quasiparticle poisoning dynamics provides sufficient evidence that the normal probe is isolated from the system (chapter 6 of this thesis).
2. Charge sensing will be the primary measurement method for PMM state readout.
3. The versatility of the multilayer gate design justifies efforts in fabrication optimization (chapter 3 of this thesis).
4. In a two-dimensional electron gas, the heterostructure stack plays a crucial role in determining the charge sensing performance.
5. For scientific advancements, the availability of a material platform to the research community is more important than its unique qualities, which currently rules out InSbAs 2DEG as a promising material for condensed matter physics experiments.
6. The workload required to make additional experimental data useful to external readers is a waste of human resources.
7. Quantum cryptography is unlikely to play a role in communication security.
8. EU universities should offer education in English at all levels, thereby contributing to the union's prosperity and security.
9. Subsidizing electric vehicles is an inefficient use of taxpayers' money for reducing the carbon footprint and promoting sustainability.
10. The notion that technological advancements alone will be sufficient to stop climate change is not only overoptimistic but also a highly dangerous assumption.

These propositions are regarded as opposable and defensible,  
and have been approved as such by the promotor prof. dr. ir. L.P. Kouwenhoven and the  
copromotor dr. S. Goswami