

Propositions

accompanying the PhD thesis

Optically addressing semiconductor electron-spin ensembles with tunable nuclear-spin environments

1. For the scale-up towards networks of optical spin-based quantum bits, all-optical techniques to remove environmental fluctuations are preferred over RF-based dynamic decoupling schemes. (This thesis)
2. Varying the single-photon detuning of two-laser dynamic nuclear polarization at two-photon resonance provides an effective tool to disclose the dominant part of the hyperfine interaction for localized spins. (Chapter 3)
3. Successful optical enhancement of the electron spin dephasing time for donor-bound electrons can only be achieved if nuclear-spin diffusion around the localized electrons is suppressed. A permanent equilibrium Knight field at low electron-spin temperatures can provide this suppression. (Chapter 4)
4. Acceptor-bound holes in highly strained gallium arsenide are interesting candidates for coherent population trapping and quantum memory applications.
5. Increasing the educational task for PhD students by prohibiting master students from giving tutorial lectures, contradicts the ambition of the Rijksuniversiteit Groningen to be a top-100 university and will thus not work as a budget-saving strategy in the long run.
6. *"Our real illiteracy is our inability to create."* - Friedensreich Hundertwasser
The trend in developed countries to work with the head instead of the hands has made practical skills slowly disappear from our common memory. This stimulates disposing rather than repairing, creates a less diverse human species and decreases its evolutionary flexibility.
7. Videogames are the most effective medium for human-made immersive experiences and should therefore be considered a form of art.
8. If intelligent machines ever become self-aware, humans will not notice it because of their fundamental incapability of recognizing consciousness in anything other than humans.
9. If one of the human senses could be made more sensitive, increased smell would have the most positive effect on society.

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