PRITZKER SCHOOL OF MOLECULAR ENGINEERING

PhD DEFENSE

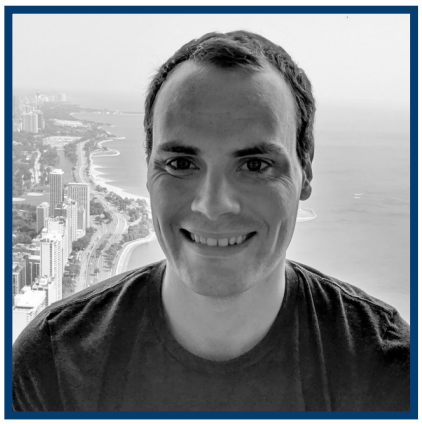
Control of spin qubits in a classical electronics material

WHEN

Wednesday, Dec 9
3 PM CT

WHERE — VIA ZOOM

Click here to download an invite



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To Join Zoom Meeting Dec 9, 2020, at 3:00 PM Central Time (US and Canada) use the link details:
https://uchicago.zoom.us/meeting/register/tJAqf--uqTkrEteKuQkgUpMjThH5zmZokPgD
Password: 797968

Distributing entanglement in a quantum network requires a combination of high-quality photonic interfaces and long-lived quantum memories. The neutral divacancy in silicon carbide (SiC) is a particularly interesting system because it has the potential to combine both of these attributes in a material which can leverage scalable device fabrication techniques from a mature semiconductor industry. Here, we discuss recent advances in using isolated defects in SiC as spin qubits. We show how materials engineering can be used to control neighboring nuclear spins and build multi-qubit systems. We then embed this quantum system into classical electronic devices (p-i-n diodes). This simple integration allows us to control the defects' electrical environment and engineer its spin-photon interface. Overall, these results cement defects in SiC as attractive candidates for the development of quantum communication and entanglement distribution technologies.