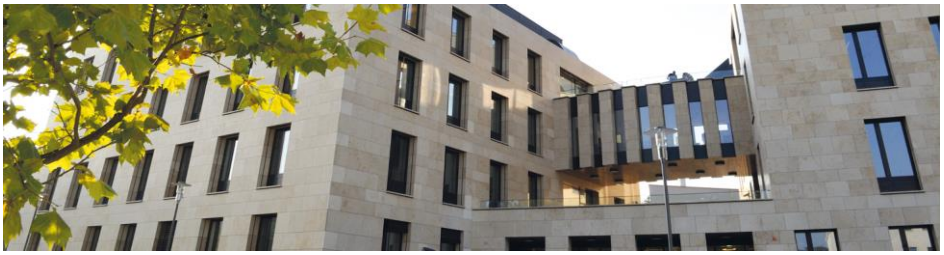
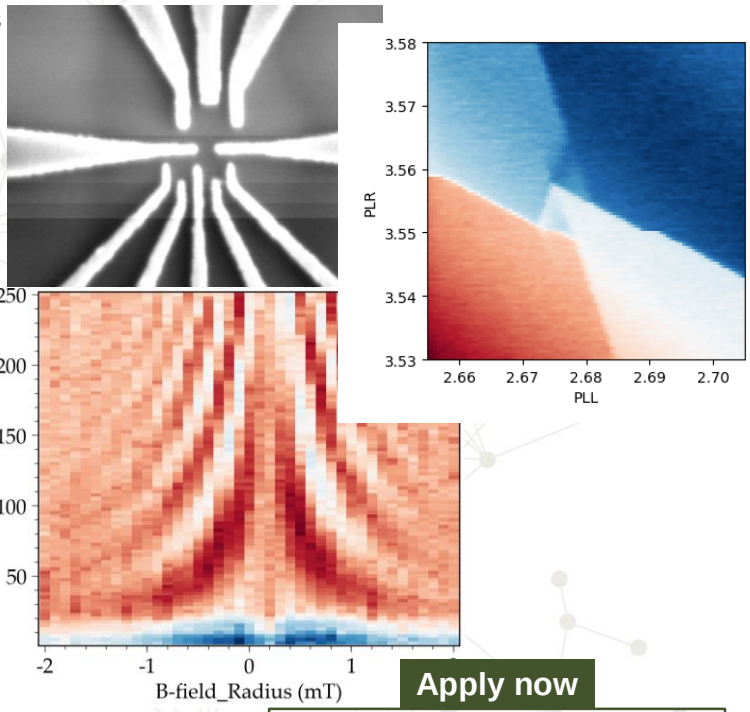


IST AUSTRIA
Institute of Science and Technology

Postdoc position
Qubits in planar Ge

While GaAs structures represent the current state-of-the art in device complexity, Si devices hold the current records in coherence times due to the nuclear-spin free environment in isotopically purified samples [1,2,3]. Ge which has been much less studied, has recently emerged as a very promising material platform for hosting spin qubits due to the suppressed hyperfine interaction and strong spin orbit coupling [4]. In only three years a single Loss-DiVincenzo qubit [5], 2-qubit and most recently even 4-qubit devices have been demonstrated [6,7].

In our group we have recently realized a hole spin qubit with dephasing times of 1 µs operating already at fields of 500µT, within the range of magnetic fields currently used for on-chip biasing of superconducting circuits. This was achieved by using the large out of plane g-factors of holes in Ge and by encoding the qubit in the singlet-triplet states of a double quantum dot device [6]. In this project we aim to use hole qubits in planar Ge devices and make further steps towards the realization of a hole spin based quantum processor.



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References:
[1] R. Hanson et al., Rev. Mod. Phys. 79, 1217 (2007).
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Requirements

- High motivation
- Excellent track record in spin or superconducting qubits
- Enjoy working in an international environment
- Solid background in the following areas: microwave techniques, low temperature physics and quantum information

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