



IFMP Seminar

Date Wednesday, September 20, 2023, at 15:00 (Unusual day and time!)

REC/C213

Speaker **Nicholas Curro**

UC Davis

Title **Spin-echo, Fidelity and the Quantum Critical Fan in TmVO_4 , a Model Transverse Field Ising System**

Abstract Using spin-echo Nuclear Magnetic Resonance in the model Transverse-Field Ising system TmVO_4 , we show that low-frequency quantum fluctuations at the quantum critical point have a very different effect on ^{51}V nuclear spins than classical low-frequency noise or fluctuations that arise at a finite-temperature critical point. Spin echos filter out the low-frequency classical noise but not the quantum fluctuations. This allows us to directly visualize the quantum critical fan and demonstrate the persistence of quantum fluctuations at the critical coupling strength in TmVO_4 to high temperatures in an experiment that remains transparent to finite-temperature classical phase transitions. These results show that while dynamical decoupling schemes can be quite effective in eliminating classical noise in a qubit, a quantum critical environment may lead to rapid entanglement and decoherence.

Host: H.-H. Klaus