

The Vienna Center for Quantum Science and Technology (VCQ)  
invites you to a

## COLLOQUIUM TALK

by

**Ron Folman**

*(Ben-Gurion University)*

### ***Realization of a complete Stern-Gerlach interferometer: Towards a test of quantum gravity***

The Stern-Gerlach effect, found a century ago, has become a paradigm of quantum mechanics. Unexpectedly, until recently, there has been little evidence that the original scheme with freely propagating atoms exposed to gradients from macroscopic magnets is a fully coherent quantum process. Several theoretical studies have explained why a Stern-Gerlach interferometer is a formidable challenge. Here, we provide a detailed account of the realization of a full-loop Stern-Gerlach interferometer for single atoms and use the acquired understanding to show how this setup may be used to realize an interferometer for macroscopic objects doped with a single spin. Such a realization would open the door to a new era of fundamental probes, including the realization of previously inaccessible tests at the interface of quantum mechanics and gravity.

**Monday, 5<sup>th</sup> December 2022**

Lise-Meitner Lecture Hall, Boltzmannngasse 5, 1090 Vienna

**17:00 get-together with drinks and snacks!**

The seminar talk will be preceded by a VCQ Student talk at 17:30 by

**Federica Cataldini**

*(Atominstitut)*

***Emergent Pauli blocking in a weakly interacting Bose gas***

**Host: Jörg Schmiedmayer**

**After the colloquium we will serve Punsch & Maroni!**

for further information and the zoom-link please visit  
<https://vcq.quantum.at/colloquium-ws-22/>