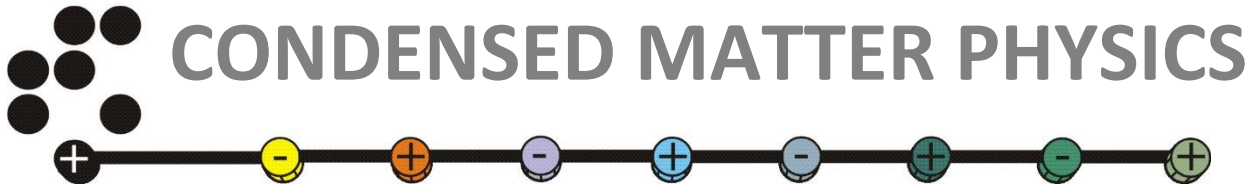


# F-5 SEMINAR



*Friday, February 3, 2023  
at 10:30 AM*

*in the seminar room of physics (room 106)  
Condensed Matter Physics, Jožef Stefan Institute*

***Matjaž Gomilšek, PhD***  
*Jožef Stefan Institute, Ljubljana*

## **Quantum magnetism, topology and *ab initio* calculations: From frustration to uncertainty**

I will present some recent highlights from my studies of frustrated quantum spin systems, classical topological magnets, and quantum effects of light particles embedded in materials. I will start with frustrated magnetism and quantum spin liquids, peculiar low-temperature states with exotic spin excitations and long-range quantum entanglement, but no long-range magnetic order. I will continue with topological magnetism of skyrmions, nanoscale swirls of magnetization that behave as discrete particles stabilized by their unconventional topology. Proposed applications for these range from low-power spintronics to artificial intelligence. I will conclude with state-of-the-art *ab initio* methods for describing quantum effects of light particles, including muons used in the powerful technique of muon spectroscopy to study the above-mentioned quantum and topological magnets.

***You are cordially invited to attend.***