

CEIPEX BUT TOPIC 6

Položka / Field	Obsah / Content
CEIPEX RESEARCH TOPIC LEVEL 1	Advanced Nano & Micro technologies
CEIPEX RESEARCH TOPIC LEVEL 2	Quantum Molecular Magnetism
NAME OF THE RESEARCH GROUP	Quantum Molecular Magnetism (RG-1-20)
SUPERVISOR	Dr. Vinicius Tadeu Santana
PROPOSED RESEARCH TOPIC TITLE	Magneto-structural properties and quantum phenomena in molecular materials
RESEARCH TOPIC DESCRIPTION	This topic focuses on understanding how molecular structure, symmetry, and dynamic interactions influence magnetic relaxation and quantum phenomena in molecular materials. Such materials hold great promise for next-generation data storage and quantum technologies, where controlling spin states at the molecular scale is key. The research combines state-of-the art spectroscopic methods and theoretical modeling to uncover the fundamental mechanisms governing magnetic and quantum behavior. By establishing clear design principles for stable and efficient molecular systems, the project aims to contribute both to scientific knowledge and to the development of sustainable technological solutions. The work is carried out in close collaboration with CEITEC VUT, CEITEC MUNI, and international partners, offering candidates a stimulating environment for interdisciplinary research in molecular quantum materials.
KEYWORDS	exchange coupling, magnetic anisotropy, structure-property prediction, high-field EPR, SQUID magnetometry
WEBPAGE OF THE RESEARCH GROUP	https://www.ceitec.eu/quantum-molecular-magnetism/rg400/about-us