TECHNISCHE UNIVERSITÄT DRESDEN

IFMP Institut für Festkörper- & Materialphysik

IFMP Seminar

Date: Tuesday, October 26, 2021, at 14:50

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Speaker: **Tao Xie**

Oak Ridge National Laboratory

Title: **Field-Induced Spin Dynamics in $CsYbSe_2$: A 2D Spin-½ Triangular-Lattice Antiferromagnet**

Abstract: Geometrically frustrated magnets provide an intriguing playground for investigation of the novel phenomena in condensed matter physics. Strong frustrations may produce large degeneracy of the ground state and prevent formation of magnetic order in favor of exotic states such as quantum spin-liquid or spin-ice phases. Two-dimensional (2D) triangular-lattice antiferromagnet is a prototypical example of frustrated antiferromagnet, and thus is a good platform to explore quantum spin liquid. I will present our recent in-field neutron scattering study on a 2D spin-½ triangular-lattice antiferromagnet, $CsYbSe_2$, a member of the large quantum spin-liquid candidate family rare-earth chalcogenides. The inelastic neutron scattering spectra evolve from highly damped continuum-like excitations at zero field to relatively sharp spin wave modes at the plateau phase. Our density-matrix renormalization group calculations with a Heisenberg triangular-lattice nearest-neighbor antiferromagnetic model reproduce the essential features of the experimental spectra, including continuum-like excitations at zero field, series of sharp magnons at the plateau phase as well as two-magnon excitations at high energy. Our work presents comprehensive experimental and theoretical overview of the unconventional field-induced spin dynamics in triangular-lattice Heisenberg antiferromagnet and sheds light on the understanding of the physics of triangular-lattice antiferromagnets.

Host: D. Inosov