

PHYS-809

**Summer School on Quantum Magnetism**

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Cursus	Sem.	Type
Physics		Obl.

Language of teaching	English
Credits	2
Session	
Exam	Written
Workload	60h
<b>Hours</b>	<b>31</b>
Courses	25
Exercises	3
TP	3
<b>Number of positions</b>	<b>35</b>

**Frequency**

Only this year

**Remark**

From 19.08.19 to 23.08.19

**Summary**

The course focuses on experimental, numerical and theoretical parts of the quantum magnets exhibiting magnetic frustration. It has been designed in such a way that both PhD and MSc students can easily follow complex research problems starting from basic concepts in this fascinating area of physics.

**Content**

Magnetic systems where quantum effects play a dominant role, have been a focused area of research for decades now. It becomes more interesting when a little bit of "frustration" is introduced into the system. EPFL-ETHZ Summer School on Quantum Magnetism will focus on such systems which exhibit remarkable properties arising from the combination of geometry of the underlying lattice and quantum effects. The summer school maintains a fine balance between underlying theory, the experimental advancements and numerical simulation methods to support the results. Program includes advanced topics such as classical and quantum spin ice, experimental observables, the dynamics near a quantum critical point, quantum dimer models, both theoretical as well as experimental aspects of quantum spin liquids and Kitaev materials, spin wave theory, exact diagonalization, quantum monte carlo, density matrix renormalization group, etc but starting with an adequate introduction to quantum magnetism at the same time. By the program of the summer school, we aim at keeping students up-to-date with the ever-growing field of frustrated magnetism, while building the core concepts to tackle research challenges.

**Keywords**

quantum magnetism, frustration, QMC, Neutron scattering, DMRG, Kitaev

**Resources****Websites**

- <http://quantumsummer.epfl.ch>