PHYS-435 **Statistical physics III**

Wyart Matthieu

Cursus	Sem.	Type
Ing.-phys	MA1, MA3	Opt.
Physicien	MA1, MA3	Opt.

Language of teaching	English
Credits	6
Session	Winter
Semester	Fall
Exam	Written
Workload	180h
Weeks	14
Hours	**4 weekly**
Lecture	2 weekly
Exercises	2 weekly
Number of positions	

Summary

This course introduces statistical field theory, and uses concepts related to phase transitions to discuss a variety of complex systems (random walks and polymers, disordered systems, combinatorial optimisation, information theory and error correcting codes).

Content

1. Introduction to statistical field theory
2. Random walks and self-avoiding polymers
3. Percolation, Networks
4. Information theory and error correcting codes
5. Disorded systems (spin glasses) and combinatorial complexity

Learning Prerequisites

Recommended courses

Statistical Physics II

Learning Outcomes

By the end of the course, the student must be able to:

- Solve problems in complex systems

Transversal skills

- Assess one's own level of skill acquisition, and plan their on-going learning goals.

Teaching methods

Ex cathedra. Exercises in class

Assessment methods

written exam

Resources

Moodle Link

- https://go.epfl.ch/PHYS-435