**Project title:** Long-time dynamics in toy models of disordered systems

**Lead faculty:** Marco Baity-Jesi, Eawag ETH, Zurich

**General area:** Disordered systems, Machine learning

**Description:**

We are interested in the long-time dynamics of simple models of glasses, with a particular emphasis on the Random Energy Model (REM) [1]. Tasks include characterizing a phase transition between two off-equilibrium phases, numerical simulations to assess the long-time behavior of the model, and the study of entropic effects in the spherical p-spin model [2] and Correlated REM [3]. References: [4, 5].

**References:**

[1] B. Derrida. Random-energy model: Limit of a family of disordered models. Phys. Rev. Lett., 45:79–82, Jul 1980.

[2] Andrea Crisanti and H-J Sommers. The spherical p-spin interaction spin glass model: the statics. Zeitschrift für Physik B Condensed Matter, 87(3):341–354, 1992.

[3] M. Baity-Jesi, A. Achard-deLustrac, and G. Biroli. Activated dynamics: an intermediate model between REM and p-spin. Phys. Rev. E, 98:012133, 2018.

[4] Matthew R. Carbone, Valerio Astuti, and Marco Baity-Jesi. Effective traplike activated dynamics in a continuous landscape. Phys. Rev. E, 101:052304, May 2020.

[5] Matthew R Carbone and Marco Baity-Jesi. Competition between energy-and entropy-driven activation in glasses. Physical Review E, 106(2):024603, 2022.

Python coding, classical statistical physics