



Thursday,

21st

May 2015

at: 4.00 pm

**Gustav-Mie-
Hörsaal,
Theodor-Lieser-
Str. 9, 06120
Halle**

*Coffee will be
served from
3.30 pm!*

Prof. Dr. Christian Holm

*Institute for Computational Physics
Universität Stuttgart*

Investigating Magnetic Soft Matter

Ferrogels are hydrogels that additionally contain magnetic single-domain particles and whose properties can be controlled by using external magnetic fields. We will present recent results on the microstructure, the magnetic behavior, and the mechanical and viscoelastic properties of 2D and 3D magnetic gels on the basis of 2 microscopic particle models. In the first model the nano-magnets are part of the chain monomers, whereas in the second model the magnetic particles are restricted to the network nodes.

We will focus on the magnetic field-actuated changes in the microstructure of the gel and correspondingly on the change in elastic behavior, magnetic response, and viscoelastic properties. We first summarize 2d computer models for the deformation by a change in the interaction between magnetic nano-particles [1]. Then we will present results for the second model where the deformation of the gel is triggered by torque transmission. In these systems, the polymer network is cross-linked by magnetic node particles. If time permits we will also present recent results on dipolar shifted particles [2].

[1] R. Weeber, S. Kantorovich, C. Holm, *Soft Matter* 8 (2012) 9923-9932.

[2] R. Weeber, M. Klinkigt, S. Kantorovich, C. Holm, *Journal of Chemical Physics* 139 (2013) 214901