CONDENSED MATTER THEORY SEMINAR

Subject: **SOLVING SPIN SYSTEMS: THE BABYLONIAN WAY**

Speaker: **Prof. Dr. Nicola Kistler (Fachbereich Mathematik, Goethe Universität)**

Date & time: **Friday, June 24th, 2022 at 3:15 p.m.**

Venue: **Room 01.114 and online:**

Zoom Link:
https://uni-frankfurt.zoom.us/j/96520912647?pwd=NWZneE5XQmlwZFJlUXJpcUhDNEtKQT09

We show that spin systems with generic (ferro- or paramagnetic, or random) interactions are "completely integrable". The approach is worked out, by way of example, for the Sherrington-Kirkpatrick model: we derive an exact formula for the quenched free energy in finite volume which involves an integral over a Gaussian field with correlation structure given by the interaction matrix (with a twist). The procedure is rigorous yet astonishingly reminiscent of the mathematically ill-defined *replica trick*, which we also recall.