ICMT Seminar

**Title:** "Dynamics of synthetic quantum matter"

**Speaker:** Alexey Gorshkov, Joint Quantum Institute, NIST/University of Maryland

**Date:** Monday, April 30  
**Time/Location:** 12:00 pm / 190 ESB

**Abstract:** Recent advances in condensed matter, optical, and atomic physics led to the emergence of highly controllable synthetic quantum matter, such as trapped atoms and ions, superconducting circuits, and implanted solid-state defects. Such synthetic quantum matter offers exciting opportunities to study far-out-of-equilibrium dynamics of many-body-quantum systems. In this talk, we will explore several facets of such dynamics. First, we will argue that sampling complexity, that is the question of how hard it is to produce a sample from a given probability distribution, lies at the heart of understanding and harnessing synthetic quantum matter in and out of equilibrium. Second, we will discuss bounds on information propagation and entanglement generation in quantum systems with long-range interactions. Finally, if time permits, we will present a solvable family of driven-dissipative many-body systems and discuss how to probe ground-state phase transitions through quench dynamics.
Monday, April 30, ICMT Seminar: “Dynamics of Synthetic Quantum Matter” Alexey Gorshkov; 12:00 pm in 190 ESB

Monday, April 30, Thesis Defense: Intertwined symmetry and Topology in $3+1$ dimensional gapped quantum phases of Matter” Apoorv Tiwari; 3:00 pm in 464 Loomis

Tuesday, May 1, Thesis Defense: “Nonlinear Machine Learning of Macromolecular Folding and Self Assembly” Jiang Wang; 10:00 am in 464 Loomis

Tuesday, May 1, Thesis Defense: “Electronic Transport and structure of a surface quantum well” Carolyn Kan, 10:30 in 3110 ESB

Tuesday, May 1, Math & Physics Seminar: “Gravity and the Planar Spin-2 Schroedinger equation” Eric Bergshoeff, 12:30 pm in 464 Loomis

Wednesday, May 2: Last Day of Spring Instruction

Wednesday, May 2: Physics Colloquium: Slichter Colloquium - "The Rise and Fall of the Fermi Liquid: The Strange Metal Near a Quantum Critical Point"; James Analytis, 4:00 pm in 141 Loomis

Visitors:
CALENDAR OF EVENTS http://physics.illinois.edu/bluesheet.asp

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Thesis Defense

Title: "Nonlinear Machine Learning of Macromolecular Folding and Self-Assembly"

Speaker: Jiang Wang

Date: Tuesday, May 1

Time/Location: 10:00 am / 464 Loomis
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Title: “Gravity and the planar spin-2 Schroedinger equation"

Speaker: Eric Bergshoeff, University of Groningen

Date: Tuesday, May 1

Time/Location: 12:30 pm / 190 ESB

Abstract:

I will give a short review of the frame-independent formulation of Newtonian gravity, called Newton-Cartan Gravity, and explain why there is a renewed interest into non-relativistic gravity in general. I will discuss, as a particular application, a recent proposal for an Effective Field Theory describing a massive spin-2 mode (the so-called GMP mode) in the Fractional Quantum Hall Effect.
**Title:** Slichter Colloquium - "The Rise and Fall of the Fermi Liquid: The Strange Metal Near a Quantum Critical Point"

**Speaker:** James Analytis, University of California, Berkeley

**Date:** Friday, April 27

**Time/Location:** 4:00 pm / 141 Loomis

**Abstract:** The Fermi liquid is the canonical picture with which we understand all conventional metals. In strongly correlated systems a novel kind of 'strange' metal emerges, the physics of which is at the core of some the most important problems in condensed matter physics, from high temperature superconductivity to the fractional quantum Hall effect. We study the physics of the strange metal in extreme magnetic fields, finding unusual behavior which hints that a deeper, universal physics is at play.
**SPIN QUBIT 4**

The 4th School and Conference on Spin-based Quantum Information Processing will be held in Konstanz, Germany, September 10-14, 2018.

Abstract submission is now open on [https://www.uni-konstanz.de/spinqubits/](https://www.uni-konstanz.de/spinqubits/) where you can find further information including a list of invited speakers, fees, deadlines, and the conference venue (see also the attached conference poster).

Spin Qubit 4 will bring together more than 40 world-leading experts and up to 200 young scientists in the field of spin-based quantum information science and technology.

This will be the fourth event in the Spin Qubit conference series. Spin Qubit 1 and 2 were held in Konstanz in 2010 and 2014; Spin Qubit 3 took place last year in Sydney.

A lecture day with introductory tutorials will precede the conference on September 9, 2018.

Application / abstract submission is now open on [https://www.uni-konstanz.de/spinqubits/](https://www.uni-konstanz.de/spinqubits/).

The application deadline is May 15, 2018.