Kolloquium

Thema: A Very Short Tour of a Very Long Career in Physics

Datum: 07.06.21

Uhrzeit: 16:15

Ort: cyberspace

Vortragender: Myriam Sarachik

City College of the City University of New York

Inhalt: Following a very brief account of the geographical, historical and work-related phases of my life, I will discuss my contributions to two specific problems in Condensed Matter Physics: (a) very early work as a postdoc on the Kondo effect and (b) the discovery (with graduate student J. R. Friedman) of Macroscopic Quantum Tunneling of the Magnetization (MQTM) in a molecular magnet thirty years later. If time permits, I will also show fascinating new data we recently obtained on the ostensibly forbidden metal-insulator transition in two dimensions.

Ansprechpartner: J. Schnack

Kolloquium Mathematische Physik

Thema: 20210723 - Jon Keating - TBC

Datum: 23.07.21

Uhrzeit: 16:15

Ort: ZOOM/Konferenzschaltung
Seminar Hochenergiephysik

Thema:  
Is Our Universe the Remnant of Chiral Anomaly in Inflation?

Datum:  
27.04.21

Uhrzeit:  
14:15

Ort:  
Online, via ZOOM

Vortragender:  
Azadeh Maleknejad

CERN, Geneva

Modern cosmology has been remarkably successful in describing the Universe from a second after the Big Bang until today. However, its physics before that time is still much less certain. It profoundly involves particle theory beyond the Standard Model to explain long-standing puzzles: the origin of the observed matter asymmetry, nature of dark matter, massive neutrinos, and cosmic inflation. In this talk, I will explain that a new framework based on embedding axion-inflation in left-right symmetric gauge extensions of the SM can possibly solve and relate these seemingly unrelated mysteries of modern cosmology. The baryon asymmetry and dark matter today are remnants of a pure quantum effect (chiral anomaly) in inflation which is the source of CP violation in inflation. As a smoking gun, this setup has robust observable signatures for the GW background to be probed by future CMB missions and laser interferometer detectors.

Ansprechpartner:  
D. Bödeker

Seminar Kondensierte Materie
The canonical means of controlling quantum spins in condensed matter is using magnetic fields via the Zeeman interaction. However, under the right circumstances, spins can also be manipulated using electric fields, opening a range of scientific and technological possibilities. I will explain how to measure this effect, and present some of our results from a range of systems exhibiting spin-electric couplings, including paramagnetic defects in piezoelectrics and ferroelectrics, magnetic atoms on surfaces, and molecular magnets.

Ansprechpartner: Jürgen Schnack
Seminar Bielefeld-Melbourne Zufallsmatrizen

Thema: Noncommutative rational functions evaluated in random matrices

Datum: 09.06.21

Uhrzeit: 09:00

Ort: ZOOM / Konferenzschaltung

Vortragender: Tobias Mai

Universität des Saarlandes, Saarbrücken

Especially after Voiculescu's groundbreaking discovery of the phenomenon of asymptotic freeness, it has become a standard technique to use Hilbert space operators in order to describe the behaviour of random matrices when their size tends to infinity. Whenever possible, this is done in such a way that the asymptotic eigenvalue distribution of any hermitian polynomial evaluated in the considered random matrices converges in an appropriate sense towards the spectral distribution of the same polynomial evaluated in the limiting operators. The latter object can be studied by operator algebraic means, in particular using tools from free probability. When involving inverses, i.e., when passing from polynomials to rational functions, the situation becomes more delicate. Indeed, not only the convergence can break down but already the evaluation might fail to exist. In my talk, which is based on joint work with Benoît Collins, Akihiro Miyagawa, Félix Parraud, and Sheng Yin, I will present some general approach to these problems, hereby answering a question of Roland Speicher.

Ansprechpartner: Anas Rahman