Upcoming Events

Colloquium

Topological and morphological analysis of random fields with applications to compressible turbulence

Topic: Topological and morphological analysis of random fields with applications to compressible turbulence

Date: 28.05.18

Time: 16:15

Place: H6

Guest: Prof. Anvar Shukorov
Newcastle University

Abstract: The theory of random functions and techniques of data analysis based on it mostly rely on the Gaussian statistical properties of the underlying random fields. This limitation is becoming less and less acceptable as the resolution, sensitivity and physical complexity of experimental and numerical data increase. Observations and simulations of compressible random flows, especially in astrophysical contexts, provide a good example of this difficulty. This work is motivated by the need to compare with observations the results of comprehensive simulations of turbulence in the interstellar medium. The quantitative methods used at present are largely limited to probability densities and Fourier spectra of random fields. Meanwhile, observations suggest widespread filamentary structures of the interstellar gas to which the available methods are insensitive. We discuss novel methods of data analysis that are applicable to intermittent, strongly non-Gaussian random fields and are based on recent developments in computational topology and morphology or random fields. Particular aspects that will be discussed include the recovery of a three-dimensional structure of a random field from its two-dimensional cross-section and the effects of magnetic field on interstellar turbulence.

Contact person: D. Schwarz

Colloquium Mathematical Physics
**Floquet Theory for Markov Processes**

**Date:** 18.05.18  
**Time:** 16:15  
**Place:** V3-204  
**Guest:** Thomas Kriecherbauer  
**Universität Bayreuth**

Motivated by applications from biology and physics we discuss Markov jump processes in finite state spaces with transition rates that depend periodically on time. Our main result provides conditions under which such processes are attracted by periodically varying probability distributions. The elementary proof is based on the analysis of a special class of systems of ordinary differential equations with topological fixed-point arguments being used in the non-linear case. The presentation reports on a recent paper with Lars Grüne (Bayreuth) and Michael Margaliot (Tel Aviv) [http://dx.doi.org/10.1098/rsos.172157](http://dx.doi.org/10.1098/rsos.172157).

**Contact person:** G. Akemann

---

**Seminar High Energy Physics**

**Topic:** The QCD crossover up to $O(\mu^6_B)$ from Lattice QCD

**Date:** 29.05.18  
**Time:** 14:00  
**Place:** D6-135  
**Guest:** Patrick Steinbrecher  
**Bielefeld University**

**Abstract:**
Contact person: F. Karch

Seminar Condensed Matter

**Topic:** tba

**Date:** 24.05.18

**Time:** 14:15

**Place:** D5-153

**Guest:** Ben Niklas Balz

Universität Bielefeld

**Abstract:**

Contact person: Peter Reimann

Seminar Mathematical Physics

**Topic:** Eigenvector-related correlation functions and their connection with generalized chiral random matrix ensembles with a source

**Date:** 11.01.18

**Time:** 16:00

**Place:** D5-153

**Guest:** Jacek Grela

LPTMS Université Paris-Sud

We will introduce eigenvector-related correlation functions, discuss briefly their significance in dynamical Ginibre ensemble [1,2] and present asymptotic results in the large matrix size limit.

Contact person: Gernot Akemann

Seminar AG Zufallsmatrizen

Topic: tba

Date: 27.06.18

Time: 16:15

Place: V3-201

Guest: Yacin Ameur

Lund University

Abstract:

Contact person: Gernot Akemann