# Upcoming Events

## Colloquium

**Topic:**      **Statistical Mechanical Perspectives on Cosmological Puzzles**

**Date:**       19.04.21

**Time:**       16:15

**Place:**      cyberspace

**Guest:**      [Christian Maes](#)

KU Leuven

**Abstract:**

**Contact person:** [P. Reimann](#)

## Colloquium Mathematical Physics

**Topic:**      [**Integrability and Universality in nonlinear waves**](#)

**Date:**       05.02.21

**Time:**       16:15

**Place:**      ZOOM/Konferenzschaltung

**Guest:**      [Tamara Grava](#)

University of Bristol

**Abstract:** What is an integrable system?  Intuitively, an integrable system is a dynamical system that can be integrated directly. While in principle integrable systems should be very rare, it happens that in nature, a lot of fundamental systems are  integrable such as many models of nonlinear waves, models in statistical mechanics and in theory of random matrices.  The study of nonlinear waves has led to many remarkable discoveries, one of them being 'solitons', found some 50 years ago. Solitons motivated the development of the Inverse Scattering Transform (IST). History and some examples will be discussed. Finally I will present some universality results about small dispersion limits and semiclassical limits of nonlinear dispersive waves.

**Contact person:** G. Akemann

# Seminar High Energy Physics

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| **Topic:** | **tba** |
| **Date:** | 23.03.21 |
| **Time:** | 14:15 |
| **Place:** | D6-135 |
| **Guest:** | Marco Drewes |
| | Centre for Cosmology, Particle Physics and Phenomenology - CP3, Louvain-la-Neuve |

**Abstract:**

**Contact person:** D. Bödeker

# Seminar Condensed Matter

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| **Topic:** | **Bielefeld/El Paso Mini Symposium >> Tuesday, 16.00 hrs <<** |
| **Date:** | 02.03.21 |
| **Time:** | 16:00 |

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| **Place:** | ZOOM / Konferenzschaltung |
| **Guest:** | PhD students and PostDocs |
| | Bielefeld & El Paso University |
| **Abstract:** | 16:00 CET, 8:00 MT: Mark Pederson and J\"urgen Schnack - Welcome 16:05 CET, 8:05 MT: Patrick Vorndamme (UBI) - Free induction decay under unitary time evolution and Heisenberg interactions 16:25 CET, 8:25 MT: Alex Johnson (UTEP) – FLOSIC: A Method for F-Electron Molecular Magnets 16:45 CET, 8:45 MT: Julian Ehrens (UBI) - Classical Molecular Dynamics Simulations of Nanometer-thin Carbon Nanomembranes 17:05 CET, 9:05 MT: Coffee, soft drinks - Help yourself 17:10 CET, 9:10 MT: Karma Dema (UTEP) – Towards a fully coupled DFT-based spin-Hamiltonian 17:30 CET, 9:30 MT: Henrik Schl\"uter - Approximating thermodynamic functions of spin systems with the Chebychev Method 17:50 CET, 9:50 MT: Zahra Hooshmand (UTEP) – Multiferroicity in a Mn3 Molecular Magnet 18:10 CET, 10:10 MT: Good bye - prepare for dinner/lunch |
| **Contact person:** | [Jürgen Schnack](#) |

## Seminar Mathematical Physics

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| **Topic:** | **The Character Expansion in effective Theories for chiral Symmetry Breaking** |
| **Date:** | 03.12.20 |
| **Time:** | 16:30 |
| **Place:** | ZOOM / Konferenzschaltung |
| **Guest:** | [Noah Aygün](#) |
| | Universität Bielefeld |
| **Abstract:** | |
| **Contact person:** | [Gernot Akemann](#) |

# Seminar Bielefeld-Melbourne Random Matrices

**Topic:** **On integrals of the tronquee solutions and the associated Hamiltonians for the Painleve II equation**

**Date:** 03.03.21

**Time:** 09:00

**Place:** ZOOM / Konferenzschaltung

**Guest:** Lun Zhang

Fudan University, Shanghai

**Abstract:** In this talk, we consider a family of tronquée solutions of the Painlevé II equation $q''(s) = 2q(s)^3 + sq(s) - (2? + 1/2)$, $? > -1/2$, which is characterized by the Stokes multipliers $s\_1 = -\exp[-2??i]$, $s\_2 = ?$, $s\_1 = -\exp[2??i]$ with ? being a free parameter. These solutions include the well-known generalized Hastings-McLeod solution as a special case if $? = 0$. We derive asymptotics of integrals of the tronquée solutions and the associated Hamiltonians over the real axis for $? > -1/2$ and $? ? 0$, with the constant terms evaluated explicitly. Our results agree with those already known in the literature if the parameters ? and ? are chosen to be special values. Some applications of our results in random matrix theory are also discussed. Joint work with Dan Dai and Shuai-Xia Xu.

**Contact person:** Anas Rahman