

Aktuelle Veranstaltungen

Kolloquium

Thema: Arbeitsgruppenvorstellung

Datum: 06.12.22

Uhrzeit: 14:15

Ort: H6

Vortragender: Dozenten der Physik

Inhalt:

Ansprechpartner: [Fachschaft](#)

Kolloquium Mathematische Physik

Thema: tba

Datum: 13.01.23

Uhrzeit: 16:15

Ort: D5-153

Vortragender: [Felix Finster](#)

Universität Regensburg

Inhalt:

Ansprechpartner: [G. Akemann](#)

Seminar Hochenergiephysik

Thema: [Relativistic dynamics in black hole systems and efforts toward the discovery of nano-Hz GWs](#)

Datum: 12.12.22

Uhrzeit: 16:15

Ort: D6-135

Vortragender: [Prerna Rana](#)

TIFR Mumbai

Inhalt: The study of bound particle trajectories around a rotating black hole is crucial to understanding many astrophysical phenomena. I will present a new closed-form analytic solution for the generalized non-equatorial eccentric bound particle trajectories, and their fundamental frequencies, in the Kerr spacetime using general relativity. The trajectories are expressed in the eccentricity, inverse-latus rectum, spin, and Carter's constant (e, ℓ, a, Q) parameter space. The generalized solutions also enabled us to obtain the necessary bound orbit conditions for (e, ℓ, a, Q) and novel specialized formulae for equatorial, spherical, and non-equatorial separatrix orbits. Next, I will present the Generalized Relativistic Precession Model (GRPM), which utilizes the analytic solutions of trajectories in the Kerr spacetime, to explain the origin of Quasi-periodic oscillations (QPOs) in black hole X-ray binaries (BHXRBS). Our analysis of the plasma fluid flow around a Kerr black hole in the relativistic disk edge suggests that instabilities cause QPOs to originate in a torus region spanned by geodesics. The application of the GRPM will also be shown for X-ray QPOs seen in Seyfert galaxies. Toward the end, I will discuss our recent efforts for the first official data release of the Indian Pulsar Timing Array (InPTA), which will be incorporated into the global effort of the International Pulsar Timing Array (IPTA) consortium to discover nano-Hz gravitational waves emitted by the relativistic supermassive black hole binaries.

Ansprechpartner: [D. Schwarz](#)

Seminar Kondensierte Materie

Ein Vergleich von kleinen klassischen und quantenmechanischen Spinsystemen

Thema:

Datum: 01.12.22

Uhrzeit: 14:15

Ort: D5-153

Vortragender: Jonas Steffan

Universität Bielefeld

Inhalt:

Ansprechpartner: [Jürgen Schnack](#)

Seminar Mathematische Physik

Thema: [String-localized quantum fields and some phenomenological applications](#)

Datum: 01.12.22

Uhrzeit: 16:00

Ort: D5-153

Vortragender: [José Gracia Bondia](#)

University of Zaragoza, Spain

Inhalt: Over fifteen years ago, on the basis of modular theory, string-localized quantum fields (SLQF) were developed by Mund, Rehren, Schroer and Yngvason. There were precedents for them, particularly in work by Buchholz and Fredenhagen towards the end of last century. On the theoretical side, SLQF allow to deal with Wigner particles not covered by Wightman's axioms. They provide as well for new viewpoints and techniques in the phenomenology of the Standard Model.

Ansprechpartner: [Gernot Akemann](#)

Seminar Bielefeld-Melbourne Zufallsmatrizen

Thema: [Harmonically confined Riesz gas in one dimension](#)

Datum: 30.11.22

Uhrzeit: 09:00

Ort: ZOOM / Konferenzschaltung

Vortragender: [Satya Majumdar](#)

LPTMS, Universite de Paris-Sud

Inhalt: I will discuss one dimensional Riesz gas of N particles confined in a harmonic potential. The interaction between any pair of particles at positions x_i and x_j is repulsive and behaves as $\text{sgn}(k) |x_i - x_j|^{-k}$ for $i \neq j$, where $k > -2$. For $k = -1$, this model represents the one dimensional one component plasma, for $k \rightarrow 0^+$, it represents Dyson's log-gas that appears in random matrix theory and for $k = 2$, it represents the classical Calogero-Moser model. We will first compute the average density in the large N limit explicitly for all $k > -2$. Next, we will compute the exact average density (large N limit) in the presence of a hard wall at $x = w$. Finally, I will discuss the statistics of the position of the rightmost particle in the gas, and will compute the explicit large deviation functions of its distribution. We will see that the left tail exhibits a third order phase transition for all $k > -2$.

Ansprechpartner: [Gernot Akemann](#)