

## GR 14: Klassische Allgemeine Relativitätstheorie III

Zeit: Freitag 8:30–9:10

Raum: 30.45: 101

GR 14.1 Fr 8:30 30.45: 101

**Inversion of hyperelliptic integrals of arbitrary genus with application to particle motion in General Relativity** — •CLAUS LÄMMERZAHL<sup>1</sup>, VICTOR Z. ENOLSKI<sup>1,2,3</sup>, EVA HACKMANN<sup>1</sup>, VALERIA KAGRAMANOVA<sup>4</sup>, and JUTTA KUNZ<sup>4</sup> — <sup>1</sup>ZARM, Uni Bremen, Germany — <sup>2</sup>HWK, Delmenhorst, Germany — <sup>3</sup>Institute of Magnetism, Kiev, Ukraine — <sup>4</sup>Uni Oldenburg, Germany

The description of many dynamical problems like the particle motion in higher dimensional spherically and axially symmetric space-times is reduced to the inversion of a holomorphic hyperelliptic integral. The result of the inversion is defined only locally, and is done using the algebro-geometric techniques of the standard Jacobi inversion problem and the foregoing restriction to the  $\theta$ -divisor. For a representation of the hyperelliptic functions the Klein–Weierstraß multivariable sigma function is introduced. It is shown that all parameters needed for the

calculations like period matrices and Abelian images of branch points can be expressed in terms of the periods of holomorphic differentials and theta-constants. The cases of genus two and three are considered in detail. The method is exemplified by particle motion associated with a genus three hyperelliptic curve.

GR 14.2 Fr 8:50 30.45: 101

**Orbits of spinning particles in Schwarzschild- and Kerr-de Sitter space-times** — •ISABELL SCHAFFER and CLAUS LÄMMERZAHL — ZARM Uni Bremen, 28359 Bremen

Spinning particles are described within the Mathisson-Papapetrou-Dixon formalism. We calculate the orbits of particles with spin and the corresponding spin motion in Schwarzschild-de Sitter and Kerr-de Sitter space-times, determine the influence of the spin on the orbit, and evaluate the influence of the cosmological constant.