GR 13: Klassische Allgemeine Relativitätstheorie II

Zeit: Donnerstag 18:45–19:25 Raum: 30.45: 101

GR 13.1 Do 18:45 30.45: 101

Approximation of the exterior gravitational field of rotating neutron stars — •Christian Teichmüller[1], Markus B. Fröb[2], and Fabian Maucher[3] — [1]Theoretisch-Physikalisches Institut, University of Jena, Max-Wien-Platz 1, 07743 Jena, Germany — [2]Departament de Física Fonamental, Institut de Ciències del Cosmos (ICC), Universitat de Barcelona, C/Martí i Franquès 1, 08028 Barcelona, Spain — [3]Max Planck Institute for the Physics of Complex Systems, 01187 Dresden, Germany

It was shown that Bäcklund transformations can be used to generate stationary axisymmetric solutions of Einstein's vacuum field equations with any number of constants. We want to use this class of exact solutions to describe the exterior vacuum region of numerically calculated neutron stars. Therefore we study how an Ernst potential given on the rotation axis and containing arbitrary constants can be used to determine the metric everywhere. Afterwards we review two methods to determine those constants from a numerically calculated solution. Finally, we compare the metric and physical properties of our analytic solution with the numerical data and find excellent agreement even for a small number of parameters.

GR 13.2 Do 19:05 30.45: 101

Next-to-leading order spin-orbit and spin(a)-spin(b) Hamiltonians for arbitrary many gravitating spinning compact objects — •Johannes Hartung and Jan Steinhoff — Theoretisch–Physikalisches Institut, Friedrich–Schiller–Universität Jena, Max–Wien–Platz 1, 07743 Jena

At the next-to-leading order spin-orbit and spin(a)-spin(b) interaction levels, counted within a post-Newtonian approximation scheme, the complexity of Einstein's general relativity becomes apparent. Due to the nonlinearity of the field equations there appear certain three-body interaction terms in the respective Hamiltonians. In this talk we discuss those gravitational three-body correlations. Afterwards an outline of the derivation of the Hamiltonians mentioned above for arbitrary many compact objects is given. A discussion of the relative strength of the next-to-leading order interaction terms in relation to the leading order ones — via a preliminary analysis of certain special configurations of the three-body system — is provided.