GR 6: Hauptvorträge Mittwoch

Zeit: Mittwoch 8:30–10:00 Raum: A214

Hauptvortrag GR 6.1 Mi 8:30 A214

Relativistic Figures of Equilibrium — •David Petroff — Theoretisch-Physikalisches Institut, Jena, Germany

Motivated by the desire to model celestial bodies, a great deal of impressive work in Newtonian gravity concerned itself with self-gravitating fluids in equilibrium. Contributors to the field include some of the most illustrious names in physics and mathematics and a seminal book on the subject, "Ellipsoidal Figures of Equilibrium", was written by Chandrasekhar in 1969.

In this talk, I will discuss the analogous problem in general relativity. The analytic treatment of a small number of important limiting cases will be presented, but also numerical methods for dealing with the general problem. The application of these methods to exemplary situations will allow us to understand many interesting features of such figures of equilibrium and determine some of their generic properties.

Hauptvortrag GR 6.2 Mi 9:15 A214

The inner Cauchy horizon of axisymmetric and stationary black holes with surrounding matter — •Marcus Ansorg — Albert-Einstein-Institut, 14476 Golm

We investigate the interior of regular axisymmetric and stationary black holes surrounded by matter and find that for non-vanishing angular momentum of the black hole the space time can always be extended regularly up to and including an inner Cauchy horizon. We provide an explicit relation for the regular metric at the inner Cauchy horizon in terms of that at the event horizon. As a consequence, we obtain the universal equality $(8\pi J)^2 = A^+A^-$ where J is the black hole's angular momentum and A^- and A^+ denote the horizon areas of inner Cauchy and event horizon, respectively. We also find that in the limit $J \to 0$ the inner Cauchy horizon becomes singular.