Carla Cederbaum
Universität Tübingen

Title: Coordinates are messy

Asymptotically Euclidean initial data sets (M,g,K) are characterized by the existence of asymptotic coordinates in which the Riemannian metric g and second fundamental form K decay to the Euclidean metric δ and to 0 suitably fast, respectively. Provided their matter densities satisfy suitable integrability conditions, they have well-defined (ADM-)energy, (ADM-)linear momentum, and (ADM-)mass as was shown by Bartnik. To study their (ADM-)angular momentum and (BORT-)center of mass, one usually assumes the existence of Regge—Teitelboim coordinates on the initial data set (M,g,K) in question. We will give examples of asymptotically Euclidean initial data sets which do not possess any Regge—Teitelboim coordinates. This is joint work with Melanie Graf and Jan Metzger. We will also explain the consequences of these findings for the definition of the center of mass, relying on joint work with Nerz and with Sakovich.