Research Training Group
Graduiertenkolleg

Models of Gravity

RTG Models of Gravity – Online Colloquium	
Date:	13.07.2022
Time:	10:00 – 11:00 and 14:00 – 15:00
Location:	Zoom: Meeting-ID: Passcode:

Program
10:00 – 11:00   **Guillem Domènech** INFN Padova *"Gravitational waves from primordial fluctuations"*
14:00 – 15:00   **Carla Cederbaum** Universität Tübingen *"Coordinates are messy"*

Abstracts

Talk 1: **Guillem Domènech**
INFN Padova

"Gravitational waves from primordial fluctuations"

Fluctuations in the primordial universe inevitably induce gravitational waves. The resulting gravitational wave spectrum not only contains information about the spectrum of such fluctuations but on the composition of the universe at the time of wave generation. In this talk, I will present recent advancements on induced gravitational waves, including, among other possibilities, gravitational waves sourced by primordial isocurvature fluctuations and by a primordial black hole dominated universe. If time permits, I will discuss an interesting issue with the theoretical definition of the energy density of such gravitational waves, which in general is gauge dependent.

Talk 2: **Carla Cederbaum**
Universität Tübingen

"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 so-called Regge—Teitelboim coordinates. We will give examples of asymptotically Euclidean initial data sets which do not possess any Regge—Teitelboim coordinates and explain other "non-features" of the Regge—Teitelboim coordinate condition. 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.