



**Oberseminar
Geometrische Analysis, Differentialgeometrie und Relativitätstheorie**

Am Donnerstag, den **21.05.2026** spricht um **14 Uhr** im Raum **C4H33** und über **Zoom**

Dr. Annachiara Piubello
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über das Thema

**Towards a Definition of Energy and its Positivity in Spacetimes
With an Expanding Flat de Sitter Background**

The positive energy theorems serve as a fundamental pillar in the geometric development of general relativity. Proved by Schoen and Yau, and later by Witten, the original positive energy theorems are stated for asymptotically flat manifolds with either time-symmetric initial data or data whose second fundamental form decays to zero at infinity. This ansatz on the metric and second fundamental form is traditionally motivated by a desire to model an "isolated gravitational system." However, actual astrophysical massive objects are not truly isolated but exist within an expanding cosmological universe. In this talk, we present a definition of energy in the context of such an expanding universe. In this approach, we take the flat expanding de Sitter model as the background spacetime, in contrast to the more conventional Minkowski spacetime, which forces our definition of energy to be quasi-local due to the presence of a cosmological horizon. We prove positivity of the energy provided the cosmological constant associated with the de Sitter background is not too large. This is joint work with Eric Ling and Rodrigo Avalos.

Den Zoom-Link erhalten Sie per E-Mail von Martina Neu.

For participating online, please sign up by sending an email to Martina Neu.

Hierzu wird herzlich eingeladen.

Carla Cederbaum, Gerhard Huisken, zusammen mit Jan Metzger (Potsdam)