

BEVERLY K. BERGER
(NATIONAL SCIENCE FOUNDATION)

The Mysterious Case of Expanding Galileo Spacetimes

In this talk, I would like to introduce you to a mystery that Jim and I have been exploring (sporadically) for some time. Generic T^2 symmetric vacuum (a.k.a. Galileo) spacetimes in the collapsing direction arguably provide the simplest arena to explore the effect of spatial inhomogeneity on known properties of collapsing, anisotropic, vacuum, spatially homogeneous cosmologies. For example, Mixmaster dynamics in Bianchi Type IX cosmologies becomes the behavior at most spatial points of the Galileo spacetimes. Numerical experiments demonstrate this phenomenology while a consistency argument provides heuristic understanding. In the expanding direction, numerical experiments reveal that the spatially averaged dynamics approaches a single attracting spatially homogeneous model. However, in this case, similar consistency arguments exist but are less satisfactory in providing a heuristic explanation of this mysterious behavior.