

SFB 647: Space — Time — Matter

Project B7: Dynamics of Cosmological Models: The Tumbling Universe

Current knowledge of even the simplest cosmological models is still rudimentary, from a dynamical systems point of view. Our aim is to investigate special solutions to the Einstein equations in the big-bang singular limit. Emphasis is on solutions with chaotic transient behavior described by dynamics of subshift type. We begin with the two highly symmetric model classes of Bianchi type, where we expect chaotic transients with α -limit sets within the Kasner circle and its heteroclinic orbits. At a later stage the project will include models based on partial differential equations, for example of Gowdy type.