Gravitational Geometry and Dynamics Group Seminar

Mon. 12th December '22 On Campus at 11h30

Robinson–Trautman solutions in (2+1) dimensions

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The Robinson-Trautman (RT) spacetime is the simplest solution of General Relativity (GR) describing a compact source surrounded by gravitational waves. As an initial value problem, the RT spacetime evolution is a well-posed mathematical problem. The pertinent dynamical equations are equivalent to the so-called Calabi flow, and regular initial data evolve smoothly towards a final state corresponding to a remnant Schwarzschild black hole. Extensions of RT spacetimes for higher dimensions (D > 4) were recently proposed, and the essence of the RT evolution is unchanged: regular initial data evolve towards a final higher-dimensional Schwarzschild black hole. The situation for D=3 is quite different due to some peculiarities of low-dimensional GR. We will present a D=3 RT flow mimicking the essential properties of the Calabi flow. In particular, regular initial data evolve towards a final remnant BTZ black hole, and any possible asymmetry in the initial data is expelled as a radiation fluid.

https://videoconfcolibri.zoom.us/j/96224138340?

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