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On the asymptotic behaviour of gravitational radiation in N-body problems

Tuesday 4 June 2024 17:30 (1 hour)

In the first part of the talk, I will give a historical overview of various arguments pertaining to Penrose's notion of a smooth null infinity and the peeling property. In the second part of the talk, I will then give an account of my own work: After clearly formulating the mathematically and physically relevant problems, I will explain how to set up a semi-global (i.e.˜away from the timelike infinities) scattering problem for the linearised Einstein vacuum equations around Schwarzschild suitable for capturing the far-field region of a system of N infalling masses following approximately hyperbolic orbits in the infinite past based on predictions from Post-Newtonian theory. I will finally discuss elements of the proof of a theorem that contains the solution and semi-global asymptotic analysis of this scattering problem. In particular, this theorem suggests concrete, constructive corrections to various ad hoc assumptions (such as that of peeling, but also assumptions on Cauchy data decay rates) frequently encountered in the literature.

Presenter: KEHRBERGER, Leonhard