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The characteristic gluing problem of general relativity

In this talk we introduce the characteristic gluing problem for the Einstein vacuum equations. We show that the geometric obstructions to characteristic gluing of spacetimes are coming from conservation laws along null hypersurfaces. We identify these conservation laws to be the conservation of energy, linear momentum, angular momentum and the equation of motion for the center of mass. Based on this identification, we explain how to characteristically glue a given spacetime to a suitably chosen Kerr spacetime. Moreover, we describe how our characteristic gluing method yields an alternative proof of the Corvino-Schoen gluing for spacelike initial data. This is joint work with S. Aretakis (Toronto) and I. Rodnianski (Princeton).