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Some Rigorous Results about the Past and Future Behavior of Expanding Vacuum Spacetimes

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It's an old problem to understand the asymptotic geometry of an expanding vacuum spacetime as one approaches an initial singularity, or as one goes to the future. The best results assume some continuous symmetries. I will discuss recent work that does not involve any symmetry assumptions, but does have a reasonable scale-invariant curvature assumption. In particular, one goal is to characterize the existence of Kasner-like regions near an initial crushing singularity.