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Jared Speck* (jspeck@math.mit.edu), Massachusetts Institute of Technology, 77 Massachusetts Ave, Bldg. 2 Rm. 265, Cambridge, MA 02139-4307. *Singularity Formation in General Relativity*.

I will discuss some new results, joint with I. Rodnianski, on the formation of singularities in initially regular solutions to Einstein's equations without symmetry assumptions. Specifically, we showed that for an open subset of the data falling under the scope of Hawking's incompleteness theorem, the geodesic incompleteness coincides with curvature blowup. Compared to our previous works in this vein, our analytical framework is more robust and in particular is not based on approximate monotonicity identities. This allows us to treat initial data exhibiting moderate spatial anisotropy, thus going beyond the regime of nearly spatially isotropic data that we treated in earlier works. Our approach applies to open sets of data for the Einstein-vacuum equations in high spatial dimensions and to the Einstein-scalar field system in any number of spatial dimensions. From an analytic perspective, the main theorems are stable blowup results for quasilinear systems of elliptic-hyperbolic PDEs. I will provide an overview of these results and explain how they are tied to some of the main themes of investigation by the mathematical general relativity community. I will also discuss intriguing connections to other problems concerning stable singularity formation. (Received February 08, 2018)