1145-35-880 **Jared Speck*** (`jared.speck@vanderbilt.edu`), Department of Mathematics, Vanderbilt University, 1412 Stevenson Center, Nashville, TN 37240. *Singularity Formation in General Relativity.*

I will discuss new results, joint with Rodnianski, that yield constructive information about the formation of singularities in solutions to Einstein's equations without symmetry. Specifically, we showed that for an open set of smooth initial data falling under the scope of Hawking's incompleteness theorem, the geodesic incompleteness coincides with curvature blowup. Compared to our prior work, our analytical framework is more robust and 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 initial data. Our approach applies to open sets of initial 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 survey 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 the role of geometric and gauge considerations in the proofs, as well as intriguing connections to other problems concerning stable singularity formation. (Received September 16, 2018)