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Plenary Talk: Stability of marginally outer trapped surfaces and applications.

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Marginally outer trapped surfaces (MOTS) are associated with strong gravitational fields and generalize the notion of minimal surfaces to a spacetime setting. In this talk I will describe the notion of stability of marginally outer trapped surfaces and I will present several consequences of it. In particular, I will discuss the implications of stability on the spacetime evolution of MOTS, the existence of outermost MOTS in a given spacelike hypersurface, the relationship between stable MOTS and symmetries and an application to a recent area-angular momentum inequality for black holes.