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Henri P Roesch* (hroesch@uci.edu), 3700 Parkview Lane, Apt. 8A, Irvine, CA 92612. *Null Geometry and the Penrose Conjecture*. Preliminary report.

Beginning in 1973, Roger Penrose considered the relation between the mass of a spacetime and the contributions of its black holes. Penrose's physical arguments lead to a fascinating geometric Conjecture identifying the size of a black hole outer boundary or "horizon" to its mass contribution. In recent work by the author using a new quasi-local mass functional, a "doubly convex" condition for conical null hypersurfaces in spacetime was identified that would lead to a proof of the Null Penrose Conjecture. In this talk we will explore the validity of this doubly convex condition from the perspective of a stable horizon. (Received February 05, 2018)