The geometry of geometries: matroid theory, old and new

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The theory of matroids or combinatorial geometries originated in linear algebra and graph theory, and has deep connections with many other areas, including field theory, matching theory, submodular optimization, Lie combinatorics, and total positivity. Matroids capture the combinatorial essence that these different settings share.

In recent years, the (classical, polyhedral, algebraic, and tropical) geometric roots of the field have grown much deeper, bearing new fruits. My talk will survey, in an accessible manner, some recent successes. I will discuss joint work with Carly Klivans, Graham Denham, and June Huh.