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R Amzi Jeffs* (rajeffs@uw.edu) and **Isabella Novik**. *New Minimal Obstructions to Convexity via Nerves*.

For a collection of convex open sets, Borsuk's nerve lemma implies that their union is homotopy equivalent to their nerve, a finite simplicial complex recording the non-empty intersections of the sets. If the union of these convex sets is itself convex, then the nerve is therefore contractible. Last year Chen Frick and Shiu proved a stronger result: such nerves are collapsible, a combinatorial version of contractibility. They asked whether the converse holds, a question that myself and Isabella Novik were able to answer in the negative: there exist infinitely many collapsible complexes that are not the nerve of a cover of a convex set by convex open sets. We provide additional results about such complexes, but the question of classifying them in general remains wide open and full of subtleties. I will present some of our tools and results, a discussion of the difficulties of achieving a full characterization, and I will outline how the study of these complexes has a fundamental relationship to the study of convex combinatorial codes, a topic arising in mathematical neuroscience. (Received January 21, 2019)