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**Travis Dillon\*** (dillont@mit.edu) and **Pablo Soberón**. *New diameter Helly-type theorems.*

The classical Helly's theorem in discrete geometry states that, given a family  $\mathcal{F}$  of convex sets in  $\mathbb{R}^d$ , if the intersection of every collection of  $d + 1$  sets in  $\mathcal{F}$  is nonempty, then the intersection of *all* sets in  $\mathcal{F}$  is nonempty. In 1982, Bárány, Katchalski, and Pach asked what could be said about the diameter of the global intersection if the diameter of each of the local intersections is bounded below. They conjectured an optimal diameter Helly-type theorem which remains unproven.

Recently, this area has experienced a flurry of activity. This talk discusses one aspect of this flurry: a new, surprisingly simple method for proving powerful diameter Helly-type theorems via parametrization. As an application of this technique, we completely characterize the norms which admit a “no-loss” diameter Helly-type theorem and determine the minimal required size of the local intersections in these cases. (Received January 25, 2022)