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The Kneser-Poulsen Conjecture in the Plane

Abstract for the Colloquium 2005 May 5

If a finite set of disks in the plane is rearranged so that the distance between each pair of centers does not decrease, then the area of the union does not decrease, and the area of the intersection does not increase. This very basic geometric property of the Euclidean plane was conjectured by Kneser and Poulsen in the 1950's and described in Chapter 3 of Klee and Wagon's book on unsolved problems in plane geometry and number theory. The proof with Károly Bezdek not only provided a solution to the problem in the plane, but also introduced at least three new techniques for this and related Kneser-Poulsen type problems. There are several related problems and extensions to higher dimensions that are still open, including the original Kneser-Poulsen problem for dimensions greater than 2.
