Michigan Math Club

Thursday at 4pm in the Commons
Free Pizza and Pop

Curvature Without Derivatives

Christopher Mooney

In the early 1800s, Carl Friedrich Gauss was hired to perform a geodesic survey of a region in Germany. The process of surveying, called ``triangulation'', involves selecting a number of landmarks, and measuring the distances between them. Thus one covers the land with a network of triangles. Information about the curvature of the land can be obtained from figuring out how these triangles fit together. Gauss spear-headed the branch of mathematics, called differential geometry, which uses calculus to understand curvature of surfaces embedded in space. This talk, however, is about how Gauss's observations also lead to a more elementary approach to curvature, which uses triangulations directly to understand curvature, without derivatives. We discuss this approach and some of its applications.