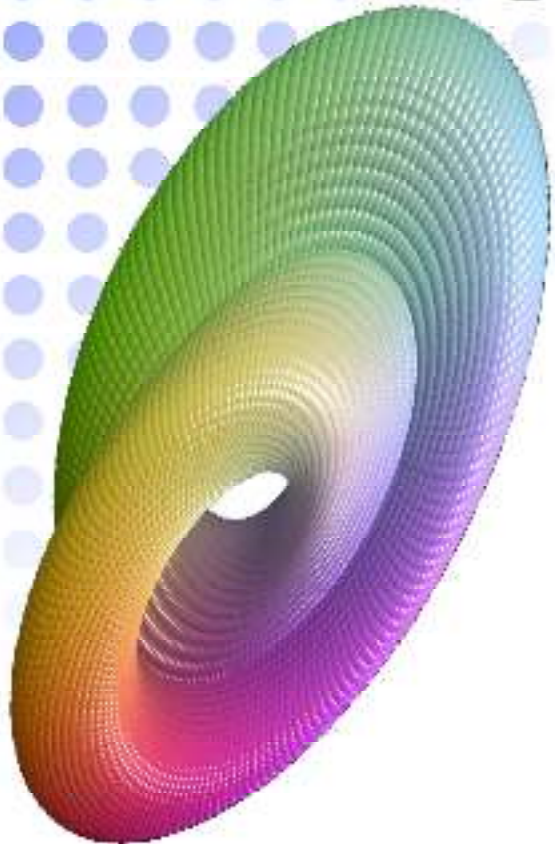
Michigan Math Club

Thursday at 4pm in the Commons

Free Pizza and Pop



The Geometry of the Hausdorff Metric

David Montague

Abstract for 2 April

Have you ever tried to measure the distance between two objects, but weren't sure exactly how you should do it? Perhaps the shortest distance between the two? What if the objects are touching? Maybe the distance between their “middles”? What if there isn't a well-defined “middle”? It turns out that, in the early 20th century, Felix Hausdorff introduced the Hausdorff metric as a way of measuring the distance between the nonempty and compact subsets of a given metric space. By applying the Hausdorff metric to n-dimensional Euclidean space, we have a mathematically sound way of measuring the distance between the aforementioned objects.

The Hausdorff metric over Euclidean space, however, gives us more than just a way of measuring distance; it also gives rise to a fascinating geometry with many unexpected properties. In this talk, we will define metric spaces and introduce the Hausdorff metric, develop its basic properties, and discuss some of the many geometric generalizations that have been investigated.