Advanced Research Initiative

M MARSHALL | MATHEMATICS & PHYSICS

Speaker: Dr. Sebastian Cioaba

Date: 5 November 2024 at 1:00 PM

Location: SH 516

Online link: https://bit.ly/4eN5gkX

Title: Optimal distortion embeddings of graphs into Euclidean spaces

Abstract:
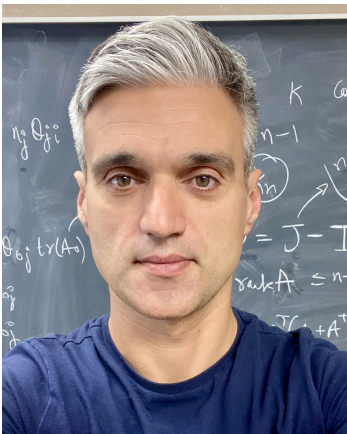
Embedding graphs into Euclidean spaces with least distortion is a topic well-studied in mathematics and computer science. Informally, this problem deals with representing a graph by points in an Euclidean space such that the distances between the vertices of the graph are not too "distorted" ("expanded" or "contracted", I will explain this formally in the talk) from the distances between their corresponding points in the Euclidean space.

Despite a lot of research, there are just a few graphs for which the precise least distortion and a least distortion embedding is known. In 2008, Vallentin studied this problem for distance-regular graphs and obtained a lower bound for the least distortion of a distance-regular graph. In addition, he showed that this bound is tight for Hamming and Johnson graphs as well as strongly regular graphs and conjectured that his bound is always tight for distance-regular graphs. In this talk, I will describe our current progress on this problem This is joint work with Himanshu Gupta (University of Delaware) and Ferdinand Ihringer (Ghent University, Belgium) and Hirotake Kurihara (Yamaguchi University, Japan).