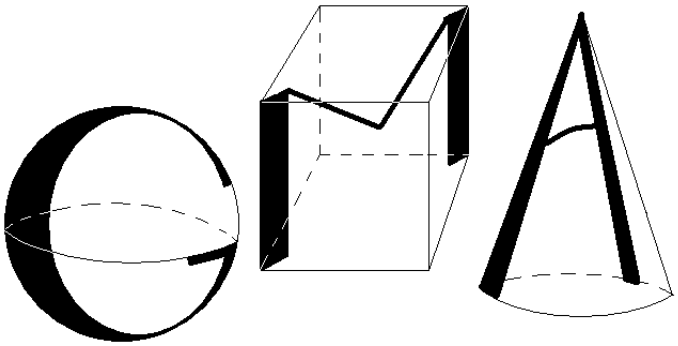

Colloquium

Wednesday November 19, 3:00 p.m. (8^{th} Period)

In the Atrium
Refreshments provided.

Speaker: Fatima Akinola

Title: On the Spread of Graphs in Euclidean Spaces

Abstract

Let $\Gamma(G, d)$ denote the set of all mappings from the vertex set, $V(G)$ of a graph G into $\mathbb{R}^d$, where d is a positive integer. We define the spread function of G in dimension d by

$$g(G, d) = \inf_{\alpha \in \Gamma(G,d)} \frac{\max\limits_{x \sim y} |\alpha(x) - \alpha(y)|}{\min\limits_{x \sim y} |\alpha(x) - \alpha(y)|}.$$

Equivalently, by restricting ourselves to the set $\Phi(G, d) \subset \Gamma(G, d)$ consisting of all mappings $\varphi : V(G) \to \mathbb{R}^d$ such that the distance between any two adjacent vertices $x \sim y$, is at least 1. Under this normalization, the spread function is the infimum, over all mappings in $\Phi(G, d)$ of the maximum distance between adjacent vertices.
In this work, we investigate metric embeddings of graphs into Euclidean spaces of varying dimensions, and study bounds and exact values of the spread function for selected graphs. By leveraging chromatic number and homomorphism, we derive general theorems that yield sharper bounds an more efficient computations of spread function.