

Geometry, Groups and Dynamics/GEAR Seminar (held at the Illinois hub of GEAR)

12:00 pm, Thursday, February 11, 2016, 243 Altgeld Hall

David Berg (Illinois)

Characterization of Aleksandrov Spaces of Curvature Bounded Above by Means of the Metric Cauchy-Schwarz Inequality

Abstract: Joint work of I.D.Berg and I.G.Nikolaev. We employ the previously introduced notion of the K -quadrilateral cosine, the cosine under parallel transport in model K -space, denoted by $\text{cosq}K$. In K -space, modulus $\text{cosq}K$ bounded by 1 is equivalent to the Cauchy-Schwarz inequality for tangent vectors under parallel transport. Our principal result states that a geodesic space (of diameter bounded by half the hemisphere diameter for positive K) is a $\text{cat}K$ space if and only if $\text{cosq}K$ is bounded by 1. If, in addition, 1 is actually achieved for two directed non-collinear segments, the geodesic span of the two segments is isometric to a section of K -plane. The diameter restriction is significant. This talk will be devoted to illustrating and explaining these results. If there is time, I will give the ideas of the proofs, veiling the difficult computations that arise, especially in the case of nonzero K , in a decent obscurity.

[Video](#)