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Convexity of Balls in the Outer Space

In this talk we answer questions regarding the strongest convexity properties of geodesics and balls in Outer space equipped with the Lipschitz metric. We introduce a class of geodesics called balanced folding paths and show that, for every loop α, the length of α along a balanced folding path is not larger than the maximum of its lengths at the end points. This implies that out-going balls are weakly convex. The applications and conjectures will be discussed as well. This is joint work with Kasra Rafi.