RUI SUN, University of Alberta
Measure of Axiality for Convex Figures

For a convex body K in R^2 with $\mu(K) = 1$, the Kovner Besicovitch theorem states that one can inscribe a centrally symmetric (symmetric about a point) body of area at least 2/3 inside K. The minimizer is given by the triangle, where the maximal inscribable centrally symmetric body has only area of 2/3. In the spirit of this theorem, we consider the question: what is area of the largest convex body which we can inscribe in K that is symmetric about a line (we call this axiality)? Lassak showed that for any K, this number is at least 2/3. Unlike in the centrally symmetric case, no minimizer was found to verify if this lower bound is sharp. In our paper, we are able to improve this bound to 0.695. On the other hand, the known concrete examples of bodies with low axiality had an axiality of $2\sqrt{2} - 2 \approx$ 0.828 which is attained by triangles and a specific parallelogram (and thus giving us an upperbound on the axiality of arbitrary convex bodies). Only recently, Choi discovered a quadrilateral which improved this upper bound to 0.816. We found an example with axiality $\frac{1}{3}(\sqrt{2}+1)$ and believe this to be the minimizer. I will explain in my presentation of how we attain the improvements on the upper and lower bounds of axiality. This talk is based on a joint work with Ritesh Goenka, Kenneth Moore, and Ethan White.