Title: Ma-Trudinger-Wang curvature and regularity of optimal transport:

Abstract:

Optimal transportation concerns the phenomena when the cost of matching two mass distributions is minimized. Regarding the regularity of such optimal transport maps, a new notion of curvature, called MTW curvature, was found recently by Ma, Trudinger and Wang. In these lectures, we discuss MTW curvature and regularity of optimal transport, focusing the case when the transportation cost is given by the Riemannian distance squared:

1. Introduction to MTW curvature
2. Examples of manifolds with nonnegative MTW curvature
3. Regularity of optimal transport maps I
4. Regularity of optimal transport maps II

Main References:

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Y.-H. Kim and R.J. McCann. Appendices to original version of Continuity, curvature, and the general covariance of optimal transportation. Preprint at arXiv:math/0712.3077v1.

Y.-H. Kim. Counterexamples to continuity of optimal transportation on positively curved Riemannian manifolds. Int. Math. Res. Not., Art. ID rnn120:1–15, 2008.

Y.-H. Kim and R.J. McCann. Towards the smoothness of optimal maps on Riemannian submersions and Riemannian products (of round spheres in particular). Preprint at arXiv:math/0806.0351v1 To appear in J. Reine Angew. Math.

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