1163-52-68 **Tom Needham*** (tneedham@fsu.edu) and **Samir Chowdhury**. *Applications of Gromov-Wasserstein distance to network science.*

Recent years have seen a surge of research activity in network analysis through the lens of optimal transport. This perspective boils down to the following simple idea: when comparing two networks, instead of considering a traditional registration between their nodes, one instead searches for an optimal 'soft' or probabilistic correspondence. This perspective has led to state-of-the-art algorithms for robust large-scale network alignment and network partitioning tasks. A rich mathematical theory underpins this work: optimal node correspondences realize the Gromov-Wasserstein (GW) distance between networks. GW distance was originally introduced, independently by K. T. Sturm and Facundo Mémoli, as a tool for studying abstract convergence properties of sequences of metric measure spaces. In particular, Sturm showed that GW distance can be understood as a geodesic distance with respect to a Riemannian structure on the space of isomorphism classes of metric measure spaces (the 'Space of Spaces'). In this talk, I will describe joint work with Samir Chowdhury, in which we develop computationally efficient implementations of Sturm's ideas for network science applications. We also derive theoretical results which link this framework to classical notions from spectral network analysis. (Received August 05, 2020)