1154-68-2284 **Thomas Strohmer*** (strohmer@math.ucdavis.edu), Department of Mathematics, Davis, CA 95616. *A Rigorous Framework for Data Clustering.*

Organizing data into meaningful groups is one of the most fundamental tasks in data analys and machine learning. While spectral clustering has become one of the most popular clustering techniques, a rigorous and meaningful theoretical justification has still been elusive so far. I will propose a convex relaxation approach, which gives rise to a rigorous theoretical analysis of spectral clustering. We do this by deriving deterministic bounds of finding optimal graph cuts via a natural and intuitive proximity condition related to the spectrum of the graph Laplacian. Moreover, the proposed approach provides theoretical guarantees for community detection. I will discuss extensions and applications of our framework. (Received September 17, 2019)