1010-52-2   **Assaf Naor***, Microsoft Research. *The bi-Lipschitz theory of metric spaces: A survey of recent progress and algorithmic applications.*

This talk will be devoted to the following question: When does a metric space embed with small bi-Lipschitz distortion into a "simple" normed space, such as Euclidean space or L_1? Questions of this type have been studied by analysts and geometers since the mid 1960s, and in recent years there has been a lot of progress on various fundamental problems. Devising new embedding methods involves interesting geometric, analytic, and combinatorial methods, and it turns out that such embeddings have remarkable applications to the design of approximation algorithms for several NP hard problems. In the other direction, proving that a metric space does not embed into another metric space requires the introduction of new metric invariants. The recent progress on these problems draws on techniques from analysis, geometry, combinatorics, probability, and theoretical computer science. In this talk we will survey some of the basic problems, results, and techniques of the field, and explain the connection to approximation algorithms. (Received November 29, 2004)

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