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Yang Wang* (yangwang@ust.hk), Department of Mathematics, HKUST, Hong Kong, Hong Kong. *On Generalized Phase Retrieval*. Preliminary report.

In many applications such as X-ray Crystallography, imaging, communication and others one must construct a function/signal from only the magnitude of the measurements. These measurements can be, for example, the Fourier transform of the density function. While it is well known that we can recover a function from its Fourier transform, the classical phase retrieval problem asks whether we can recover a function from only the magnitude of its Fourier transform. The phase retrieval problem has since been extended to a much broader class of settings, referring to the reconstruction of a signal from only the magnitude of its linear measurements or more generally, from quadratic measurements. The problem, even in finite dimensions, turns out to be quite challenging. Many fundamental theoretical problems remain unresolved. Equally challenging is to develop fast and robust algorithms for phase retrieval. The problem has, not surprisingly, links to a many problems in science and engineering. But more surprisingly it has also links to some classical problems on the embedding of projective spaces into Euclidean spaces and nonsingular bilinear forms. In this talk I'll give a brief overview and discuss some of the recent progresses. (Received January 14, 2017)