1108-94-149 **Shuyang Ling***, 1 Shield Avenue, Davis, CA 95616, and **Thomas Strohmer**, 1 Shield Avenue, Davis, CA 95616. *Self-calibration and bilinear compressive sensing.*

This talk brings together two seemingly unrelated concepts that both have attracted considerable attention in recent years. Compressive sensing is an ingenious strategy to sample sparse signals in an efficient way and has become a game changer in several areas of signal- and image processing. Self-calibration is an increasingly important concept, since the need for precise calibration of sensing devices manifests itself as a major roadblock in many scientific and technological endeavors. The idea of self-calibration is to equip a hardware device with a smart algorithm that can compensate automatically for the lack of calibration. We show how several self-calibration problems can be treated efficiently within the framework of bilinear compressive sensing. More specifically, we consider a bilinear system of equations y = DAx, where x and the diagonal matrix D (which models the calibration error) are unknown. We describe how one can "lift" this bilinear inverse problem to an underdetermined sparse problem and derive explicit theoretical guarantees under which both x and D can be recovered exactly, robustly, and numerically efficiently via linear programming. Applications in array calibration, wireless communications, and image processing will be discussed. (Received January 08, 2015)