1145-41-1927 **Emily J King***, king@math.uni-bremen.de, and **Nate Strawn** and **Soledad Villar**.

Introduction to Low Complexity Models in Data Analysis and Machine Learning.

The pertinent structure of real-world data, in particular in high dimensional ambient space, is often significantly simpler than the ambient dimension would suggest. Low complexity models capturing this simpler structure are essential for computational applications in high-dimensional estimation of model parameters as well as tasks like detecting the boundaries of a region of interest in an image, ascertaining trends in time-series data, and uncovering latent variables and the non-linear but dependent relationships between them. For high-dimensional inverse problems, low complexity models are often used to make problems well-posed and result in regularized solutions. Such low complexity models can take the form of union-of-subspaces models (e.g., sparsity or low-rank assumptions) or have non-linear structure (e.g., low dimensional manifolds) and may involve statistical elements. Further, generative models represented by trained neural networks have also recently proven to be powerful low complexity models. This talk will cover the basic theory and applications of low complexity models and serve as the introduction to the Special Session on Low Complexity Models in Data Analysis and Machine Learning (SS 55). (Received September 24, 2018)