Compressive sensing and recovery of functions in high dimension

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Compressive sensing predicts that (approximately) sparse vectors can be recovered from an incomplete set of linear measurements via efficient methods such as l1-minimization. This finding has a lot of potential for signal processing applications, but it may also be applied to the recovery of functions of many variables from few sample values, a key problem in information based complexity. This mini-course gives a brief introduction to compressive sensing and then focuses on function recovery. We will also outline the application of these methods to the numerical solution of parametric operator equations with high-dimensional parameter space.