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Infinite dimensional/continuous compressed sensing in physics

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Compressed sensing has had a considerable impact on inverse problems and sampling theory over the last ten years. However, the traditional compressed sensing setup and theory is usually discrete, a fact that may seem at odds with many of the physical models that are over the continuum. In this talk we will discuss how one can design compressed sensing over the continuum and how this approach changes the theory and also the algorithmic setup. There are several advantages that this path may bring. First, it allows for new types of applications in physics and potentially improved performance of the reconstruction techniques. Second, it allows for a better understanding of the asymptotic phenomena that govern compressed sensing. By understanding these phenomena one can taylor compressed sensing to the specific applications in order to optimise the quality of the reconstructions.

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