

## Richness of sparsity: random matrices, remote sensing and harmonic analysis

Many seemingly complex phenomena in areas such as physics, engineering or medicine, have a sparse representation in the sense that they can be described by a linear combination of a few elementary building blocks. This concept, known as sparsity, has gained tremendous attention in recent years, fueled by the advent of Compressed Sensing. I will demonstrate how insights from sparsity and compressed sensing lead to dramatic improvements in remote sensing, making it possible to solve problems in radar imaging that were hitherto believed to be intractable. Underlying this breakthrough is a rigorous mathematical analysis that uses tools from random matrix theory and applied harmonic analysis.

I will conclude my talk with a bold perspective of the future of sparsity and compressed sensing.