

**Title:** Large-scale inverse problems with time-harmonic waves

**Abstract:** Waves play a prominent role in many imaging problems, ranging from seismology to medical diagnosis. The resulting inverse problems can often be formulated as a PDE-constrained optimisation problem, where the PDE is a time-harmonic wave equation. Solving such a constrained optimisation problem then involves solving the PDE for multiple right hand sides repeatedly. In this talk I will discuss the interplay between forward solver and optimisation algorithm and discuss approximate and stochastic methods for large-scale inverse problems.