Coherent imaging without phases

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Imaging in typical high-frequency regimes, above the X-band (10 GHz), we may only have access to intensity data. This means that most of the information encoded in the phases are lost and, hence, imaging becomes more challeging. The classical way to deal with this problem is by alternating projection algorithms that iteratively use Fourier and inverse Fourier transforms of the data along with suitable truncation based on prior information about the object to be imaged. In this talk I will present an overview of the new methodologies developed when the phase information is in fact present in the data but is just not recorded, pointing out the challenges for a deeper understanding of why it works and how it can be improved. This is joint work with Alexei Novikov and George Papanicolaou and Chrysoula Tsogka.