
Ultrafast Holographic Microscopy

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Abstract: Femtosecond transient absorption microscopy is an important tool to study photophysical processes on the micro to nanoscale. Typically, transient microscopes are based on a scanning design where images are stitched together one pixel at a time. This is because megapixel cameras are slow, so their use leads to excess laser noise being introduced in the data. In this talk I will introduce the concept of ultrafast holographic microscopy, showing how off-axis multiplexing can be used with femtosecond pulses to decouple the speed of the detector from signal demodulation rates, which enables high-sensitivity widefield transient imaging. I will discuss how this can be used both for quasi-3D single particle tracking applications as well as to study ultrafast spatio-temporal photophysics in materials.

References:

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