

# Designing New Computational Cameras and Projectors for Physics-based Imaging and Vision

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**Abstract:** New computational cameras and projectors form the convergence of optics, electronics, and signal processing to extract more information about the visual world around us. In this talk, we will discuss a new type of diffractive CMOS pixel known as Angle Sensitive Pixels, and their ability to sample multiple plenoptic dimensions of light. We will show applications to 4D light field capture and optical computation for energy-efficient computer vision. On the projector side, we will discuss a new projector-camera system that selectively parses the light transport in a scene, yielding new information about indirect light interactions including interreflections and subsurface scattering. All this research points to exciting new opportunities for physics-based imaging and vision in our visual computing systems of the future.

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