Some people suggest that imaging is a mature field, but nothing could be further from the truth. In fact, we are entering into the next phase of innovation in which a convergence of technologies is enabling the creation of an endless variety of imaging systems based on the tight integration of algorithms, computation, and sensor design. This new field, which we call integrated imaging, is evolving out of classical imaging modalities and developing into a wide array of new modalities and applications.

Integrated imaging systems will drive both scientific exploration and consumer products by blending novel and often counter-intuitive sensor design with algorithms that exploit the availability of enormous quantities of data and computation. This talk presents some examples of state-of-the-art integrated imaging systems based on computed tomography (CT), transmission electron microscopy (STEM), synchrotron beam imaging, optical sensing, and scanning electron microscopy (SEM). For each of these examples, we also explore their use and potential impact in applications ranging from healthcare to jet engine design. We conclude with some speculation on where integrated imaging might be going; where it might have greatest impact; and what will be the greatest challenges ahead.