

# Extreme Imaging

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Wednesday, September 18 ♦ 4 P.M.

Room 118 Nieuwland Science Hall

Refreshments @ 3:30 in 202 NSH

Astronomy is now attracting much interest (and money) from the physics community. Using current projects as examples, I will describe how the evolution in electronic image sensors has enabled explosive growth in our understanding of the universe. In 30 years building instruments for major observatories, I have witnessed pixel counts increase by eight orders of magnitude and sensitivity increase tenfold, while minimum detectable signals have fallen to a few photons per hour. At the same time, our growing understanding of sensor physics has improved calibration accuracy, producing significant advances in photometric and astrometric precision. When coupled with automated surveys and image processing, it has become possible to map dark matter, and detect rare transient events or transits of extra-solar planets. We have directly observed the orbits of stars about the black hole at the galactic center, and more. When I began this journey, it was hard to imagine the words “accurately measure” being applied to the age of the universe or its accelerating expansion.