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Title: "Exploring the Birth and Evolution of the Universe - How Detectors Have Revolutionized Space Astronomy"

Presenter: Dr. Samuel H. Moseley

Abstract:

The past century has seen tremendous advances in the capability of instruments used for astronomical imaging and spectroscopy. Capabilities of instruments have expanded in many dimensions; the scale of telescopes has grown tremendously, the wavelengths used for astronomy have grown from visible light to the full electromagnetic spectrum, extending from gamma rays to low frequency radio waves. Additional advances have been enabled by the availability of space facilities, which eliminate the effects of the earths atmosphere and magnetosphere, and allow cooling of instruments to avoid instrumental thermal radiation. Even with all these advances, the increase in capability of detection systems has produced truly revolutionary improvements in capability. Today, I will describe the advances in astronomical detection from the photographic plates of the early 20th century to the giant high efficiency focal planes being developed for modern space and ground based astronomical instrument. I will review the demanding performance requirements set by space astronomy, and show how the detector community has risen to the challenge in producing high performance detectors for the Hubble Space Telescope, the Spitzer Space Telescope, and the James Webb Space Telescope, now under development.