

Abstract Submitted
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Nondestructive Analysis of Telescope Surfaces and Coatings

JULIE SCOTT, EDWARD KINTZEL, LOUIS STROLGER, SCHUYLER WOLFF,
Western Kentucky University — The Department of Physics and Astronomy at
Western Kentucky University has a Large Chamber Scanning Electron Microscope
(LCSEM) available for materials analysis. As one of 10 in the world, the capability
exists for nondestructive analysis of large samples. Currently we are investigating
using the LCSEM to quantify reflectivity and long-term integrity for large segments
of optical elements and detectors for ground and space-based environments. Com-
parisons of reflectance ratios as a function of surface roughness for Al-Coated optical
mirrors may be confirmed with the LCSEM. Long-term structural integrity of Al-
coated thinned mirror segments at ground-based facilities due to weather (oxidation)
and space-based high-radiation environments can be investigated. Fatigue behav-
ior of these metallic films from active/adaptive actuation will be simulated using the
LCSEM. New research possibilities across a broad multidisciplinary spectrum will
be key to the success of the LCSEM facility. These partnerships will lead to the
development of new and existing technologies.

Edward Kintzel
Western Kentucky University

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