

SBIR 06.2 PHASE I - AWARD DETAILS

ORGANIZATION	AMRDEC (M)
TOPIC NUMBER	A06-026
CONTRACT NUMBER	
YEAR OF AWARD	
AWARD START DATE	
AWARD COMPLETION DATE	
PROPOSAL NUMBER	A062-026-2847
TITLE	Metrology for Aspheric Domes
PROJECT MANAGER	Mikhail Gutin (518) 833-6897 gutin@appscience.com
COMPANY	Applied Science Innovations, Inc. 185 Jordan Road Troy NY 12180 Minority Owned: No Woman Owned: Yes Veteran Owned: No Number of Employees: 6
KEYWORDS	metrology, conformal optics, aspheric optics, manufacturing process
ABSTRACT	Applied Science Innovations (ASI) proposes development of the Conformal Aspheric Dome Inspection System (CADIS) – a new tool for metrology of aspheric domes and associated corrector optics, and other optics “aberrated by design”. Existing interferometers test spherical domes but fall short of measuring aggressive concave shapes typical of conformal missile domes. The patent pending CADIS, a low-cost attachment to a standard interferometer, offers automated testing procedures compatible with established processes of optics manufacturing. One simple reference element, easy to fabricate and self-test, serves all existing and future shapes of domes and correctors. Controlled coverage ranges from full-aperture interferometry to microscopic, on small subapertures. Proposed test procedure enables unambiguous restoration of wavefronts and surface profiles even from undersampled interferograms, with expected resolution better than 100 nm. Phase I will establish feasibility of the CADIS metrology tool with a proof-of-concept prototype; Phase II will produce a first generation preproduction prototype system. The ability to measure deep concave and other highly aberrated optics will enable new optical components and system designs that are presently difficult to make and impossible to measure. Commercial applications of CADIS will be in metrology and inspection of conformal domes and corrector optics, aspheric optics, and “aberrated by design” optics.
BENEFITS	The CADIS metrology on conformal optics will enable development of new high performance military systems with high-speed optical seekers and conformal windows. Broader application will be in testing aggressively aspheric components of compound lenses prior to assembly, to enable new lens designs and fabrication processes with improved quality, higher yield, and reduced cost.