



Northrop Grumman Successfully Delivers Deformable Mirror for World's Largest Solar Telescope

July 30, 2015

DEVENS, Mass., July 30, 2015 /PRNewswire/ -- The world's largest ground-based solar telescope is one step closer to operation with the acceptance of the deformable mirror engineered by AOA Xinetics, a Northrop Grumman Corporation (NYSE: NOC) company. The Daniel K. Inouye Solar Telescope (DKIST), currently under construction on Haleakala on the island of Maui, Hawaii, will offer unprecedented high-resolution images of the sun using the latest adaptive optics technology to provide its distortion-free imaging.

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Led by the National Solar Observatory (NSO) and the Association of Universities for Research in Astronomy (AURA), the Inouye Solar Telescope will help scientists better understand how magnetic fields affect the physical properties of the Sun, what roles they play in our solar system and how they affect Earth.

Ground-based telescopes, whether observing the sun or the night sky must contend with atmospheric turbulence that acts as a flexible lens, constantly reshaping observed images. This turbulence makes research on solar activity difficult and drives the need for the latest adaptive optics technology.

To provide DKIST with the distortion-free imaging it requires, AOA Xinetics (AOX) designed a deformable mirror with 1,600 actuators, four times the normal actuator density. This deformable mirror (DM) is instrumental in removing all of the atmospheric blurriness that would otherwise limit the telescope's performance. The mirror also has an internal thermal management system to handle the intense solar energy coming from DKIST's telescope.

"The science DKIST will produce is groundbreaking and transformational for solar astronomy," said Thomas Rimmele, project director, National Solar Observatory. "The AOA Xinetics mirror is the highest-performing DM I've ever observed and it will help us revolutionize solar imaging."

Harvey Bass, the DKIST Contracts Officer adds, "Thanks to Northrop Grumman and AOA Xinetics. They were great to work with and built an incredible deformable mirror on time and on budget."

With over 20 years of experience building ultra-reliable, cutting-edge optics and adaptive optics systems, AOA Xinetics was able to quickly engineer this complex and unique mirror to the exacting specifications of the DKIST operating environment. AOX successfully utilized the 1,600 actuators to correct the mirror's surface to an average error of 4 nanometers, or about the height of 40 hydrogen atoms stacked on top of each other.

"There will always be challenges when you do something that's never been done before that others have failed to achieve. But fortunately, we have a team of incredibly experienced and talented engineers and technicians who rose to the occasion and built this ground-breaking mirror," said Jeff Cavaco, chief scientist and program manager, AOX. "It is an honor to work with AURA and NSO on this telescope and support the important science sure to come."

DKIST is funded by the National Science Foundation. The project is managed by the Association of Universities for Research in Astronomy and the National Solar Observatory. DKIST represents a collaboration of 22 institutions from across the solar physics community, including, the High Altitude Observatory, the New Jersey Institute of Technology, the University of Hawaii for Astronomy, and the University of Chicago Department of Astronomy and Astrophysics. International instrument partners include Germany and the United Kingdom.

[AOX Xinetics](#), a Northrop Grumman company and part of the Aerospace Products group, designs, develops and manufactures a wide variety of standard and custom electro-optic and optomechanical systems for government, industrial and commercial customers. Since the company's inception, AOX has been manipulating light from the corner grocer to the edges of the universe providing customers with the highest quality products and services.

Northrop Grumman's Aerospace Products business unit offers advanced capabilities to customers on earth and in space, and is a leader in bringing new technology to market. Their expertise ranges from high powered lasers and adaptive optics to microelectronics and reliable space products. Delivered via agile, focused business units, the Aerospace Products team works with commercial and government customers worldwide. Visit: www.northropgrumman.com/Capabilities/AerospaceProducts for more information.

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