

Inside Wallops

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Wallops is a Player in a Next -Generation Challenge: Reducing the Cost of Building Large Mirrors

NASA's latest ultraviolet/optical telescope concept — a potential successor to the Hubble Space Telescope — could discover the existence of life-bearing, Earth-like planets in our galaxy and give scientists insights into how the universe develops over time. But it can't be built unless engineers figure out how to build a less expensive primary mirror.

"We need to bring down the costs of mirrors," said Goddard technologist David Content, who is now investigating optics requirements for the proposed Advanced Technology Large-Aperture Space Telescope (ATLAST), one of the 19 mission concepts NASA is funding under the Astrophysics Strategic Missions Concept Studies.

Under the study effort, Content is leading a Goddard optics team examining designs, including a possible 8-meter, monolithic primary mirror or a segmented, 16-meter primary mirror.

Overall, the study team includes engineers from other NASA Centers, the Space Telescope Science Institute, industry, and academia. At this point, mirror construction for either size remains a showstopper.

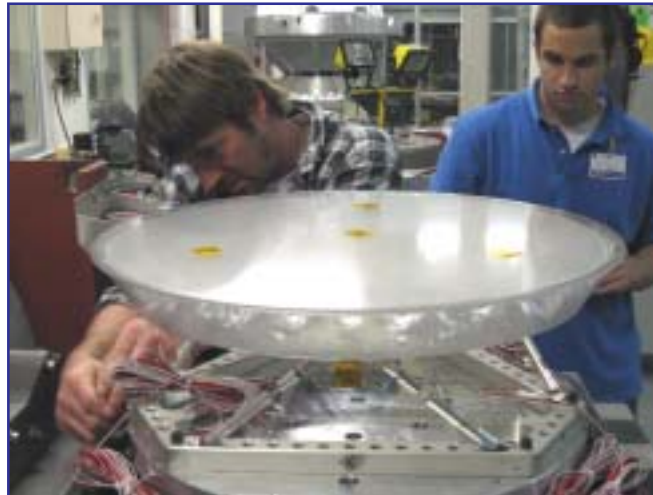
"Today it costs about \$4 million per square meter to build a primary mirror," Content said. "That means an 8-meter primary mirror would cost about \$200 million. At those prices, you've just priced yourself out of the running."

Content believes a potential solution is within reach. Supported in part by the Innovative Partnerships Program and previous Goddard Internal Research and Development funding,

Content has been working with ITT Space Systems to advance the technology-

readiness level of the company's "corrugated mirror."

This technology starts with five thin sheets of glass — front and back plates and three intermediate layers. The intermediate layers are molded and fused to the outer plates to efficiently support the front of



Rob Marshall, NSROC, and Alex Pini, Penn State intern prepare the corrugated mirror for an environmental test.

the mirror at many points. The end result is a lighter, less costly mirror that takes a fraction of the time to produce.

Traditional mirror-making techniques are dramatically different. Typically in the construction of a large mirror or a piece

of a segmented mirror — similar to the ones Content and his team are investigating for ATLAST — technicians would begin with a solid blank of glass and remove almost all of it to reduce its weight. They then would polish the glass to meet an exact optical prescription.

"With ITT's approach, we're building up, rather than taking away," Content said.

Although still in the testing phases, Content is optimistic that the technology could reduce mirror-construction costs by a factor of three to 10 and satisfy the light-gathering needs of future NASA astronomy missions.

Last summer, Content and his team ran environmental tests at NASA Wallops Flight Facility on a half-meter-wide mirror segment. It survived, advancing the technology's readiness to a level four.

Another test is currently underway at Wallops by NASA Sounding Rocket Operation Contract (NSROC) employees in the Building F-10, Environmental Lab.

If the mirror survives that test, the technology becomes an attractive solution for nearer-term missions, Content said.

Advanced Modular Gun Demonstrator Tests are Successful

Science Applications International Corporation (SAIC) has announced that the Advanced Modular Gun Demonstrator (AMGD) was successfully tested at NASA's Wallops Flight Facility.

SAIC engineers worked with Naval Surface Warfare Center - Dahlgren and Indian Head Divisions to develop a high-performance, modular, large-caliber, powder test gun.

During testing, the AMG achieved a successful shot of an unassisted round, which traveled more than 85 statutory miles. The distance was measured by Wallops' tracking systems. Early results indicated that a new record may have been set for distance of a gun-launched projectile.

Avoid Being A Skin Cancer Statistic (Or Worse)

The American Cancer Society estimates there will be more than 62,000 new cases of melanoma diagnosed in the U.S. in 2008 and more than 8,400 deaths from the disease.

Use protective sunscreens liberally and be knowledgeable about SPF (sun protection factor). The SPF rating is calculated by comparing the amount of time needed to produce a sunburn on protected skin to the amount of time needed to cause a sunburn on unprotected skin.

A fair-skinned person might normally turn red after 10 minutes in the sun. Ten minutes is their "initial burning time."

The highest-number SPF sunscreen will not protect completely against basal cell or squamous cell skin cancers and is even less effective at preventing melanoma, the most serious and deadly form of skin cancer.

UVB rays burn: using sunscreens with an SPF of 30 or more will give partial protection against skin cancer.

UVA rays also cause skin cancer and wrinkles. UVA penetrates deeply into the skin and is not blocked by SPF sunscreens - use zinc oxide, titanium dioxide or avobenzone.

The sunscreen you use should be labeled water-resistant. Apply sunscreen 30

minutes or more before going out, even on a cloudy day, especially if going to a beach or out on the water.

Between 10 a.m. and 4 p.m., limit your time in the direct sun. Wear a wide-brimmed hat that shades the tops of your ears, your face and the back of your neck.



Wear sun glasses that provide ultraviolet protection. Sunglasses without UV protection actually increases UV exposure to your eyes, as the reduced intensity of visible light causes your pupils to dilate and increases the amount of UV radiation entering your eyes.

Avoid tanning salons and tanning beds. If you want a tanned look, use tanning lotions or sprays.

Some people think about sun protection only when they are planning to spend a full day at the beach or pool.

Sun exposure happens whenever you are in the sun — gardening, fishing, hiking, riding a bike, going to the zoo, attending a baseball game, or going to and from your car.

The damage adds up, so it's important for you to take precautions to protect your skin day after day.



Wallops Shorts.....

A NASA Terrier Mk70 Improved-Orion was successfully launched from Wallops on July 14.

The flight was a technology demonstration to test new tracking, data processing, payload positioning, power and communication systems. The payload weight was 660 pounds. The tapered IRMA recovery system weighed 750 pounds.

Greg Smith, (retired) and John Hickman NASA Wallops Flight Facility were the experimenters. Libby West, NASA Range and Mission Management Office, was the project manager. Ted Gass, NASA Sounding Rocket Operations Contract was the mission manager.

Let's Play Ball

The Wallops Young Professionals Organization is organizing a "Best of Wallops" softball tournament.

The tournament will be held on July 26 at 10 a.m. Location TBA. Several organizations at Wallops are organizing teams to participate.



If your organization, company, or friends would like to participate in this tournament, contact Rebecca Powell at x1139 or Michelle Leimbach at x2156 as soon as possible.

Space Sensor Workshop

NASA Marshall Space Flight Center is sponsoring a workshop on new technologies for sensor development. Speakers and participants from NASA centers, other government agencies, and industry are invited to participate in the workshop.

The primary objective of this workshop is to identify areas of advancement in sensor measurements and technologies that will help to define standard practices and procedures that will better enable the infusion into flight programs of sensors with improved capabilities but limited or no flight heritage.

These standards would be crucial to demonstrating a methodology for validating current models while also creating the possibility of being able to have sufficient data to either update these models or develop new models based on the ability to simulate the new measured physical parameters.

The workshop also is intended to narrow the gap between sensor measurements (and techniques), data processing techniques and the ability to make use of that data by gathering together experts in the field for a short workshop.

Workshop registration, abstract submittal, hotel accommodations and other information can be found at: www.spacesensorworkshop.com

Round Two Sale of NASA 50th Anniversary T-Shirts

\$7.00 Size Youth Medium ~ Adult XL
\$8.00 Size XXL ~ XXXXL

Purchase online at: <http://www.tcbspecialties.com/nasa50th.html> or contact Karen Shannon at x2020 for further information.

Orders will be taken July 14 to August 1. No orders will be taken after August 1.

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