

AMOS ships the “biggest eye on the sun” to Hawaii

The Daniel K. Inouye Solar Telescope (DKIST) is the world’s largest solar telescope. It is currently under construction by AURA, the Association of Universities for Research in Astronomy (*) on top of the Haleakala mountain on the Maui island in Hawaii, and is expected to start its operations in 2019.

With a primary mirror of 4.2 m in diameter, DKIST – formerly called Advanced Technology Solar Telescope (ATST) – will dwarf by its size previous solar telescopes. It is packed with complex technologies in order to capture very detailed images of the sun’s constantly-changing surface with a resolution twice better than former solar observatories. It is an off-axis telescope, equipped with an active and thermally-controlled primary mirror and adaptive optics.

One of the key elements of the telescope, the primary mirror cell, has been designed and manufactured in Belgium by AMOS. It consists of a 9 ton high-precision electro-mechanical subsystem which guarantees that the 4.2 m primary mirror keeps its exact position and shape in all circumstances, despite continuously changing orientations and temperatures.

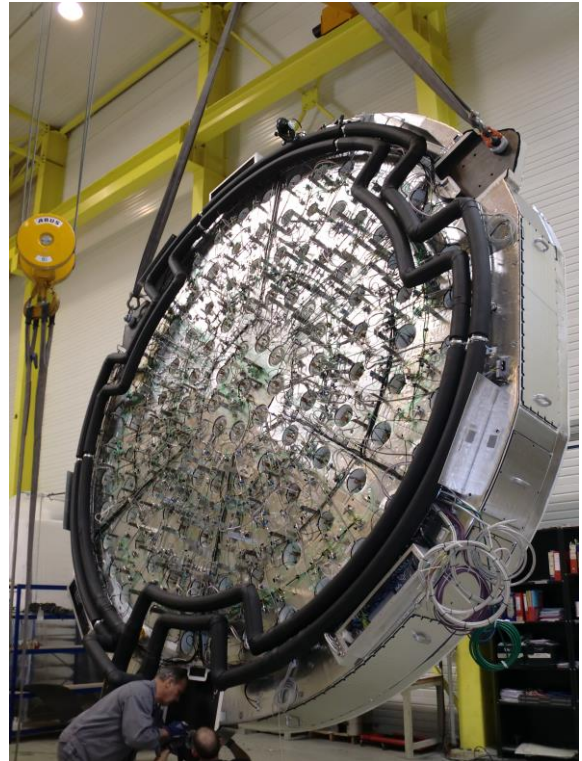
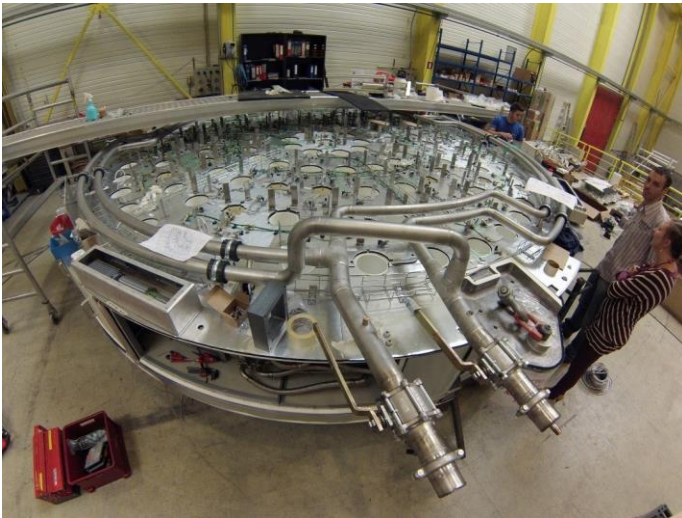
The performances of this system are mind-blowing:

- The 3-ton mirror will be positioned with a precision of a few micrometers, i.e. 40 times better than the thickness of a human hair, in all positions of the constantly moving telescope.
- 142 pneumatic and hydraulic actuators will continuously correct the shape of the thin primary mirror to an accuracy better than 45 nm RMS. As a comparison, if the mirror was the size of the Atlantic Ocean, the perfectness of the surface would be equivalent to removing all waves higher than a few centimeters.
- The temperature uniformity will be controlled within half a degree Celsius, from early morning to late evening, including at noon when the mirror is fully exposed to the sun heat.

After a successful Factory Acceptance Test in January 2017, the customer formally accepted the mirror cell and its handling equipment in the AMOS facilities, and authorized their shipment to Hawaii where they arrived at the end of June. Although the project is not over yet, the client has already expressed how satisfied he is about the quality of the work and the very good collaboration spirit between the DKIST project team and AMOS.

Philippe Gilson, AMOS’ CEO, stated: “AMOS engineers and workers are used to build complex equipment that have never been done before and this is a new glaring example. We have once again overcome the technical challenges to produce a system that outperforms the specifications of our customers. With this project, AMOS demonstrates its expertise in the field of large solar telescopes, in addition to its extensive track record in the field of astronomical telescopes.”

(*) AURA is a consortium of 42 US institutions and 5 international affiliates that operates world-class astronomical observatories.



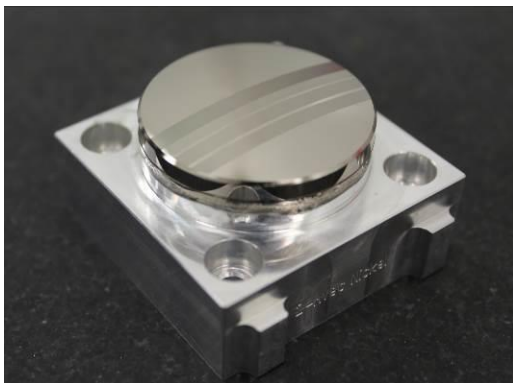
4.2m active solar cell during assembly

AMOS in a few words

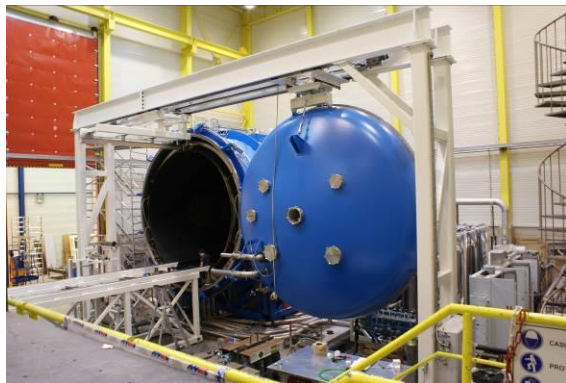
Located at the heart of the “Liege Science Park” in Sart Tilman, Liège, Belgium, AMOS has been designing and building high-precision optical and mechanical custom equipment for more than 30 years. Its flagship achievements are professional telescopes, terrestrial or space optical systems, test equipment for space devices, and high-precision mechanical equipment. It occupies today more than 100 employees highly skilled in advanced technologies and offers services to the space industry and to the professional astronomy sector.

AMOS’ turnover in 2016 was 18 million Euros, with more than 90% for export.

The company has most of its customers in Europe (ESA, ESO, AIRBUS DEFENSE & SPACE, THALES ALENIA SPACE, OHB), in the United States (AURA), in India (ISRO, PRL, ARIES), and has recently expanded its business in countries like China, Turkey or Russia.



Hyperspectral Imaging Spectrometer component for the ISRO lunar mission Chandrayaan II



Thermal-vacuum Test Facility for VSSC (ISRO)



ATS (Auxiliary Telescope Systems),
“mobile” telescopes of the VLTi in Chile (Cerro Paranal)

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