

Dresden, 25.04.2016

VON ARDENNE TECHNOLOGY ENABLES ADVANCED RESEARCH IN ASTRONOMY

In early March 2016, VON ARDENNE has received a substantial order from the Association of Universities for Research in Astronomy (AURA) for a magnetron sputter system. It will be used to coat the mirrors of the Large Synoptic Survey Telescope (LSST*). Thus, VON ARDENNE has prevailed against some established competitors and won the AURA tender with the best offer.

The observatory is currently under construction on the Cerro Pachón mountain in northern Chile. The mirror telescope will feature a primary mirror with a diameter of 8.4 meters, a secondary mirror and a tertiary mirror (5 and 3.4 meters in diameter). This optical arrangement will enable a comparatively wide field of view. The telescope, in combination with the largest digital camera ever constructed, will be able to record the entire visible sky in just three nights. As the telescope will continuously take pictures, even the slightest changes in the position or brightness of astronomical objects can be analyzed over a long period of time.

Highly reflective telescope mirrors are vital for research in astronomy. In order to achieve a high reflectivity, the mirrors will be coated on their front side with an ultra-thin metal layer by means of a vacuum deposition process. VON ARDENNE will provide the necessary special equipment and technologies.

VON ARDENNE is a leading manufacturer of coating equipment for large-area applications, for instance in the architectural glass or solar industry. Thanks to that, the company has acquired decades of experience in the vacuum processes and technologies that are necessary for such a project. Therefore, VON ARDENNE is well positioned to provide excellent systems for the coating of telescope mirrors.

Mirror Coatings for Maximum Reflectivity

The mirror surfaces will be coated with a thin silver or aluminum layer to make them highly reflective. This layer will then be sealed with a nanometer-thin protective coating. Over time, however, the mirror will lose its excellent reflectivity due to dirt particles and other influences. Therefore, it will have to be coated again periodically. In order to do that, the entire mirror and its substructure (approx. 75 tons) will be moved to the coating system with the help of an elevator. The coating system will be located in the same building as the telescope (see image).

With this project, VON ARDENNE will revive a passionate interest of its founder. Throughout his life, Manfred von Ardenne had been a dedicated amateur astronomer. He established several observatories, two of them in Dresden. Furthermore, he promoted the construction of the observatory in Heringsdorf on the Usedom island, and supported it by donating a mirror telescope with a magnification of 720. The observatory was named in his honor.

*** Further Information about the Large Synoptic Survey Telescope**

The effort to build the LSST is a partnership between public and private organizations. Financial support for LSST comes from the [National Science Foundation](#), the [Department of Energy](#), and private funding raised by the [LSST Corporation](#), a non-profit 501(c)3 corporation formed in 2003, with headquarters in Tucson, AZ. [Contributions](#) from private foundation gifts, grants to universities, and in-kind support from laboratories and other [LSST Member Institutions](#) were key to early construction and critical developments.

With the help of the LSST, the scientists are aiming at mapping the Milky Way, other smaller objects (such as asteroids that might get close to the earth) in our solar system and changes in the night-time sky. Beyond that, they will look for dark matter and dark energy and want to observe short-time phenomena such as supernovae.

The Large Synoptic Survey Telescope is a mirror telescope with three mirrors: the primary mirror with a diameter of 8.4 meters, into which the 3.4 meter tertiary mirror is integrated, and the secondary mirror, which has a diameter of 5 meters. The site of observatory is located on the ridge of the Cerro Pachón mountain in northern Chile at an altitude of 2,682 meters. Due to the extremely dry climate of this region, the night-time sky is very clear. That is why there are already several observatories in northern Chile, two of which are also on the Cerro Pachón. The construction work on the LSST started in July 2014, the laying of the foundation stone was in April 2015. The first light, i.e., the first use of the telescope for testing purposes, is planned for 2019 and full science operations will begin when construction is completed in 2022.

The LSST will have a field of view of 3.5 degrees, which is considerably wider than those of other telescopes of a similar class (the sun and the moon have a diameter of 0.5 degrees when observed from the earth). That is what will enable the LSST to record the entire visible sky in only three nights in the first place. The images will be captured by the largest digital camera ever built. It has a focal plane with a diameter of 0.64 meters and a resolution of 3.2 billion pixels. The camera is expected to produce up to 30 terabytes of data per night.

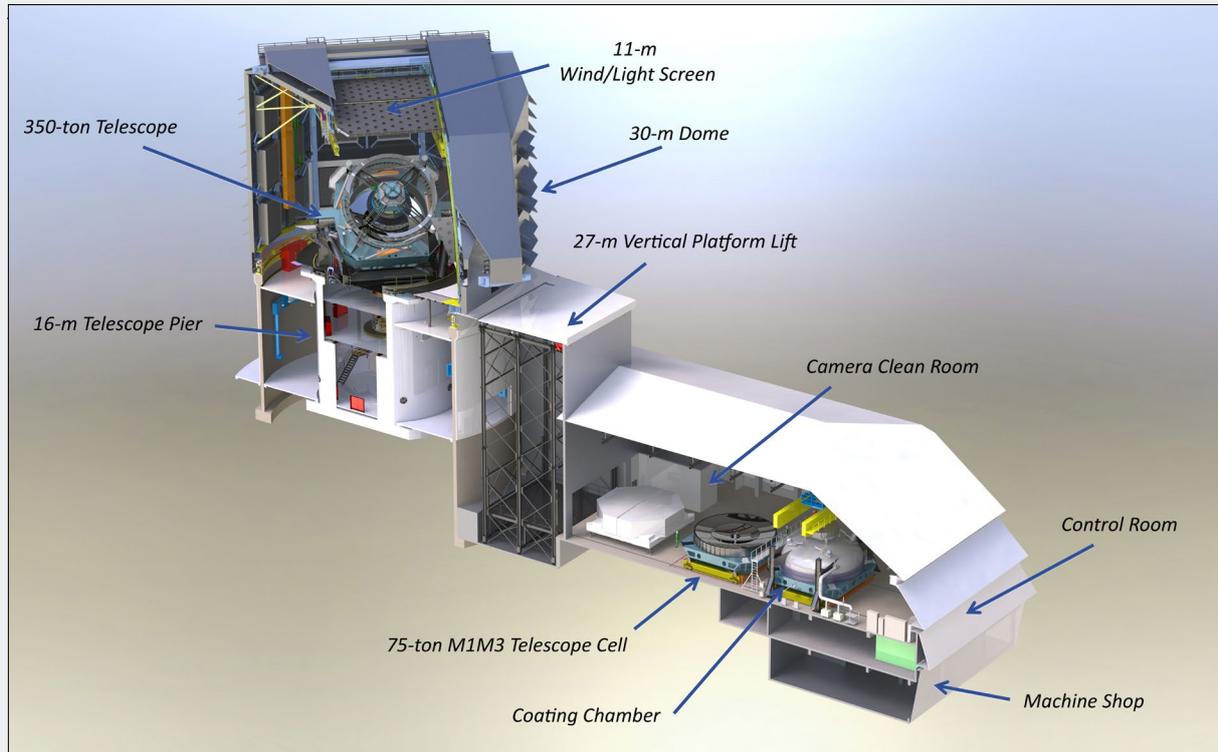


Image credit: LSST, [Telescope Cutaway with Labels](#)

See also: LSST, [Image Use Policy](#)

This material is based upon work contracted by the Association of Universities for Research in Astronomy, Inc. ("AURA") with support from the National Science Foundation through Cooperative Agreement AST-1258333.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

ABOUT VON ARDENNE

VON ARDENNE develops and manufactures equipment for industrial coatings on materials such as glass, wafers, metal strip and polymer films. These coatings give the surfaces new functional properties and can be between one nanometer and a few micrometers thin, depending on the application. The coated materials are the basis for products such as architectural glass, solar modules or touch screens.

VON ARDENNE is a leading provider of architectural glass coating equipment and coating systems for thin-film photovoltaics. The family-owned company employs about 650 people and is based in Dresden. In 2014, the company earned a sales revenue of 201 million Euros with an export ratio of 96.4 percent. As a global corporation with subsidiaries in China, Japan, Malaysia, Taiwan and the USA, VON ARDENNE relies on customer proximity in order to offer ideal on-site service. VON ARDENNE equipment is in operation in more than 50 countries around the world.

CONTACT

Dr. Andreas Purath

Phone: +49 351 2637 300 / 9750

Fax: +49 351 2637 308

E-Mail: purath.andreas@vonardenne.biz**PRESS CONTACT**

Ingo Bauer

Phone: +49 351 2637 9000

Fax: +49 351 2637 308

E-Mail: presse@vonardenne.biz