Rostec installs astronomical optics at the largest telescope in Eurasia

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Press release

Shvabe holding company (part of State Corporation Rostec) has completed the installation of a mirror at the Large Altazimuth Telescope (BTA) in the Special Astrophysical Observatory of the Russian Academy of Sciences (SAO RAS) in Karachay-Cherkessia. The telescope with updated astronomical optics, which increase the range of observations 1.5 times, will begin working this fall.

The key element of BTA installed by Rostec experts is a mirror with a diameter of 6 meters. The surface of the mirror shape is now being adjusted, and the curvature and deviation of the mirror surface from the specified form are being measured. This will help to adjust the supporting systems that the mirror sits on. The final step will be to apply a reflective coating to the surface with a special vacuum unit.

"Our technologies allow us to create a mirror weighing several dozen tons and process it with nanometer precision. The combination of the large size of the mirror and the unique reflective optical characteristics will allow Russian scientists to work with one of the most advanced telescopes in the world over the coming decades. The new optics increase the range of observations by 1.5 times, greatly expanding the horizons of research," commented the **Executive Director of State Corporation Rostec Oleg Yevtushenko.**

In order to avoid deformation of the mirror, which weighs over 40 tons, 60 special supporting systems are used when pivoting the telescope. Employees of the Lytkarino Optical Glass Factory (LZOS) of the Shvabe Holding worked to improve the quality, accuracy, and penetrating power of the six-meter mirror.

"The history of the telescope began with making two mirrors in the 1970s. The first was used in the first four years, after which it was replaced by a more advanced one. After nearly 40 years of operation, the surface quality has deteriorated significantly, and it was decided to send the first mirror to LZOS for an upgrade. Today, adjusted to the new weight, it has been successfully installed into BTA. The shape of the surface was also evaluated. The RAS has already received the first test shots. The final work on improving the mirror surface and further configuration, which will complete the preparatory phase, is now underway. The upgrade will provide 40-50 years of trouble-free operation of the telescope," said the **General Director of Shvabe Holding Alexey Patrikeev.**

Until 1993, BTA was the largest telescope in the world. Today, it is the largest optical telescope in Eurasia.

Rostec is a Russian State Corporation established in 2007 with the purpose of facilitating the development, manufacture and export of high-tech industrial products for both civil and military purposes. It incorporates over 700 entities that currently form 11 holdings operating in the military-industrial complex and 4 holdings active in civilian industries, as well as over 80 directly supervised organizations. Rostec's portfolio includes such well-known brands as AVTOVAZ, KAMAZ, Kalashnikov Concern, Russian Helicopters, VSMPO-AVISMA, Uralvagonzavod, and others. Rostec companies are located in 60 regions of the Russian Federation and supply products to the markets of over 100 countries. In 2017, Rostec's consolidated revenue reached RUR 1.589 trillion, its consolidated net profit was RUR 121 billion, and EBITDA was RUR 305 billion. According to Rostec's Development Strategy, the mission of the Corporation is to ensure

Russia's technological advantage on highly competitive international markets. One of Rostec's key goals is to implement a new technological way of living and to promote the digitalization of Russia's economy.

Shvabe Holding is part of State Corporation Rostec and brings together several dozens of organizations that make up the core of the optical industry in Russia. The Holding enterprises provide the whole cycle of creation of new optoelectronic and laser technology in the interests of national defense, state and public security, and for civil industries. At their production sites, innovative optoelectronic and laser systems for the Armed Forces of the Russian Federation, as well as the systems of Earth aerospace monitoring and remote sensing, optical materials, medical equipment, scientific tools and energy saving lighting are developed and serially produced. The portfolio of intellectual property is 1886 units. The range of products exceeds 6500 units. Shvabe products are delivered to all regions of Russia and exported to 95 countries of the world. Today representative offices of the Holding are located in China, Germany, Switzerland and Belarus.