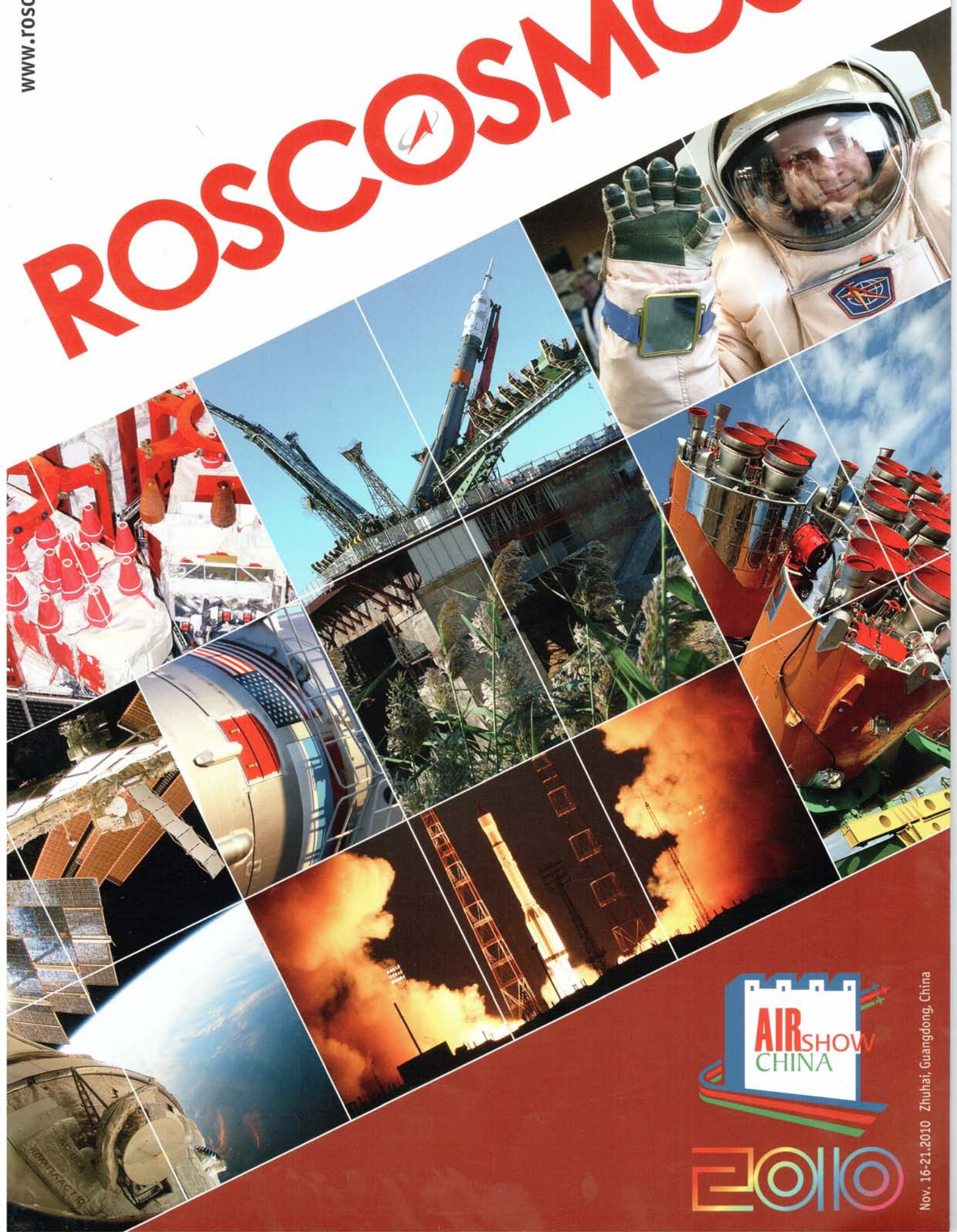


ROSCOSMOS





Anatoly Perminov,
Head of the Russian
Federal Space Agency

RUSSIAN FEDERAL SPACE AGENCY



The Russian-Chinese relations in the space field are being developed dynamically and consistently. The relations have a long-standing history. The Subcommittee on cooperation in the field of space plays an exceptionally important role in this respect. The Subcommittee, as a bilateral body established within a framework of regular meetings between the heads of the Governments of Russia and China, has become a key link in our relations in this field. Its establishment has contributed to stepping-up the Russian-Chinese cooperation.

Since January 2008 a representation office of the Federal Space Agency in the People's Republic of China functions in Beijing. It has been founded in pursuance of the Edict of the President of Russia and the Decree of Government. We architect our relations with the Chinese partners with due account of those significant results achieved by China in the field of exploration and utilization of outer space. By no accidental manner of means still greater role in our relations is played by the cooperation in new and promising directions. These directions include the arrangement of interaction in the field of space vehicles for earth remote sensing, electronic component base and materials for the rocket-and-

space equipment, fundamental space investigations (exploration of the Moon and deep space), establishment of the satellite communications system in favor of the Shanghai organization for cooperation as well as the element base of the user's navigation equipment.

All this has been reflected in the Program of Russian-Chinese cooperation in the field of space for 2010-2012, which was signed in October last year during the 14th regular meeting of the heads of the Governments of Russia and China. The sustainable utilization of capabilities of the space industry and science with a view to solving significant challenges and programs proceeding from the traditions of friendship and cooperation shall become the basis of our future activity in space. Only the integration of efforts of the participants of space activity can help implement the scientific and applied programs, which are most of all efficient for the exploration of space environment, but are too laborious to be implemented by individual countries.

In general, the attained results of Russian-Chinese cooperation in the field of space afford the ground to consider that they will dynamically develop still further for the benefit of our nations.



**FEDERAL STATE UNITARY ENTERPRISE
SCIENTIFIC-AND-INDUSTRIAL ASSOCIATION TECHNOMASH**
40 3rd proezd Marinoy Roshchi, Moscow, Russia 127018
Phone +7 (495) 689-50-66
Fax +7 (495) 689-73-45
e-mail: info@tmnpo.ru
www.tmnpo.ru





Aleksandr Korov,
General Director

FEDERAL STATE UNITARY ENTERPRISE SCIENTIFIC-AND-INDUSTRIAL ASSOCIATION TECHNOMASH

The FSUE NPO Technomash is a headquarter organization of the Federal Space Agency (Roscosmos) in the field of technological support of building articles for the space-and-rocket equipment (SRE). The factory was established in 1938. Initially it advanced as the head enterprise in the technology of artillery ordnance production. Since August 1946 the factory participates in the activities related to building the articles of SRE.

Today the FSUE NPO Technomash is the leading scientific and technological enterprise of the rocket-and-space industry (RSI) of Russia in the field of production technologies. The main task of the enterprise consists in complex solution of technological problems of manufacturing the RSE items at stages of experimental-design developments and mass production, contribution to overcoming the negative tendencies in machine-building, instrument-building and material-science complexes of the RSI by optimizing the technical refitting of the enterprises of the industry, development and introduction of promising, breakthrough and supporting technological processes of RSE production.

A range of work fulfilled by the FSUE NPO Technomash covers all main machine-building technologies, from getting the workpiece to assembly and functional tests of the items, from non-destructive test methods and metrological support to standardization and certification of the quality manage-

ment systems. The main processes are casting, plastic working, all types of dimensional processing, including machining, electrochemical machining, electrophysical machining, getting welded and soldered joints, assembly, laser technologies; technology of applying multifunctional coatings, non-destructive test methods and aids, checking of air-tightness, development of methods and automated systems of functional tests and diagnostics of complex technical systems.

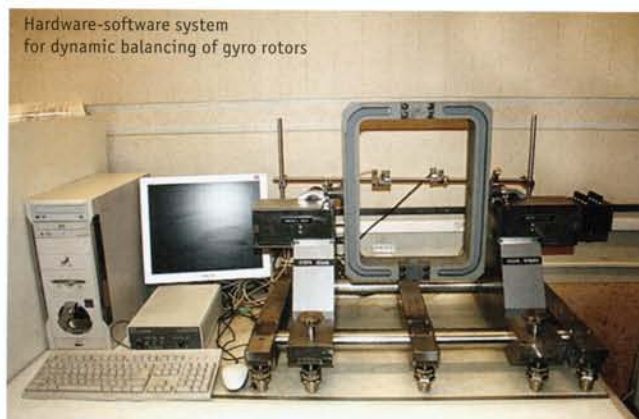
The team of employees of the enterprise has created basic, unique technological processes and special process equipment for all basic stages of technological process. Progressiveness and actuality of technical solutions for development and manufacture of the RSE items have been confirmed by 77 Russian patents.

The FSUE NPO Technomash is not only proud of its history, but is doing everything needed to comply with the cutting-edge requirements for developing the industry and is facing the future with certainty.

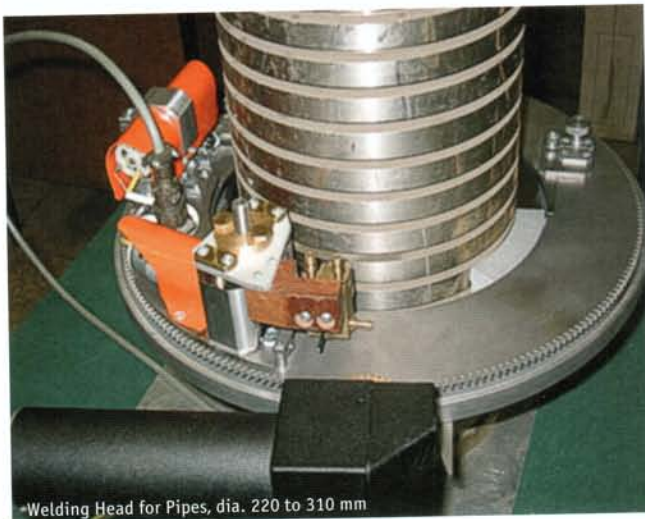
The enterprise is participating in the effective Federal target-oriented programs of the Roscosmos, conducts R&D work to create the perspective technological processes, specialized technological equipment, instruments and aids of technological tooling in the fields of machine-building and instrument production, material sciences, standardization and metrology.



Software-Hardware Complex to Monitor
Gyroscopes Mechanical Parameters



Hardware-software system
for dynamic balancing of gyro rotors



Welding Head for Pipes, dia. 220 to 310 mm



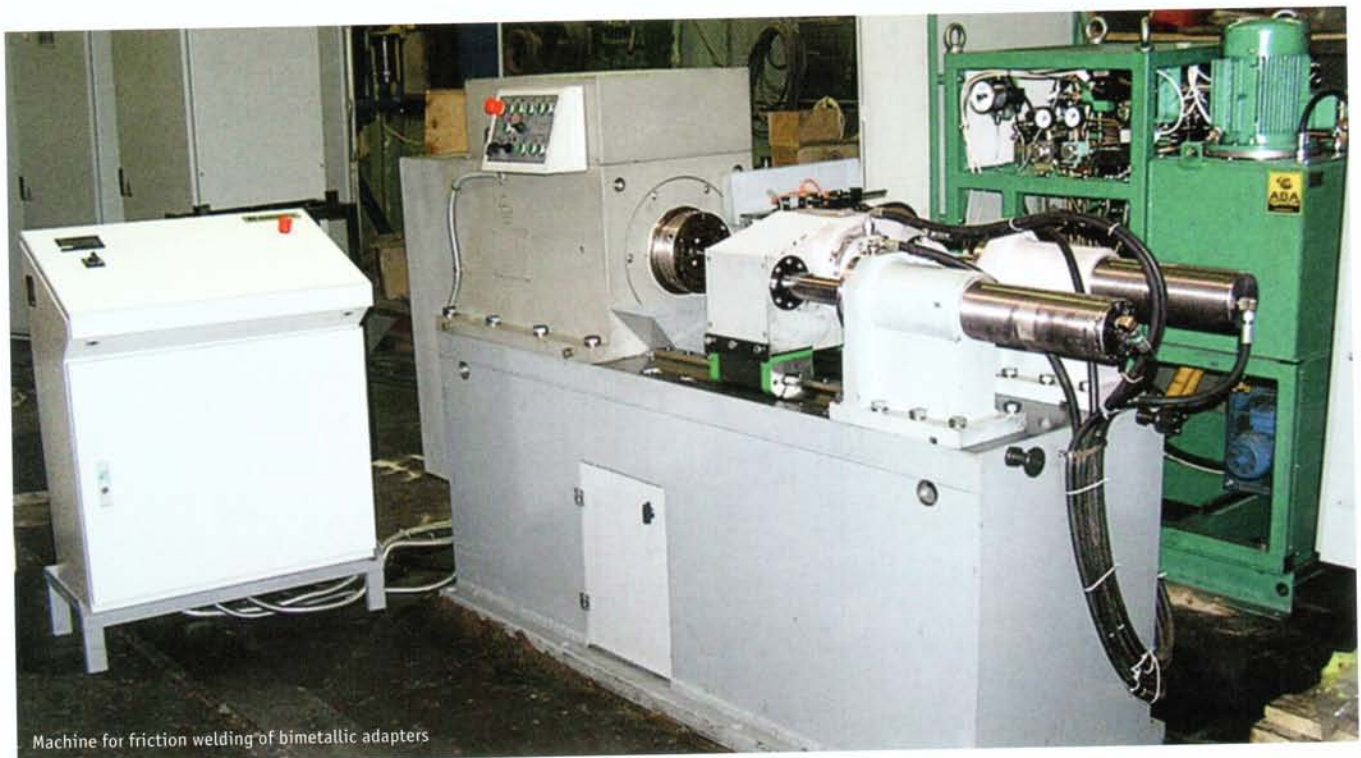
Specialized Milling Machine Tool for Producing "Waffle Background" on Casing Parts of Launch Vehicles and Sample of its Products

The enterprise is implementing a deep modernization of the special equipment with the use of modern management systems and new engineering solutions. These are machine tools to produce "waffle background" on cylindrical, conical and spherical parts of casings of launch vehicles, to mill the cooling passages of combustion chambers of liquid-fuel rocket engines (LFRE); a spectrum of special winding-outfit machines; machines to balance and monitor the gyroscope rotor dynamic moments with mass of 1 to 30 kg; welding equipment; technologies of applying various types of coatings and other types of special equipment and industrial technologies.

In order to form a unified technical policy and determine priority-oriented directions in developing the technologies and materials in the industry and also to ensure special technological equipment, a scientific and analytical center has been founded at the enterprise to carry out system investigation and prediction of the possibilities for developing new space-production technologies of special machine-building, instrument engineering and materials for the RSE, as well as

to develop proposals on implementing them by program and target methods within the framework of federal target-oriented programs at the branch and inter-branch levels. The center conducts system developments and investigations ensuring creation of the branch systems of the through computer-aided designing and production of modular SRE, including basic load-bearing structures with the built-in electronic and microelectromechanical devices for a wide range of the space on-board and ground radioelectronics. It builds up a scientific-and-technical and experimental stocks required for the implementation of multi-functional technological space systems and space-based production robotic tools as well as the systems of their functional support.

The FSUE NPO Technomash in the context of its scientific and technical potential is ready for further expansion of scientific investigations and developments in the field of industrial technologies for producing the SRE articles and fruitful cooperation with the foreign partners in these branches of activity.



Machine for friction welding of bimetallic adapters