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The International Space Station

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In this paper considers the issues of appointment of the station and the challenges that face her. Before proceeding to the consideration of these issues, turn to the history of the ISS (**International Space Station**).

Let's start with the fact that the ISS is manned orbital station used as a multipurpose space research facility. The ISS is a joint international project involving sixteen countries: Belgium, Brazil, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Norway, Russia, Spain, Switzerland, Sweden, UK, USA. Its history of creation begins with 1984, when U.S. President Ronald Reagan announced the start of works on creation of an American space station[1]. It was planned to build large-managed station, the modules which would be delivered on orbit by the space Shuttle. But by the early 1990s, it became clear that the development cost of the project is too large and only international cooperation would create such station. 17 June 1992, Russia and the USA signed an agreement on cooperation in space research. In accordance with the Russian space Agency and NASA have developed a joint program Mir - Shuttle". During the implementation of this program appeared the idea of unification of national programmers for the creation of space stations. In 1993 in the USA, many politicians were against the construction of the space station[2]. In the USA Congress the proposal to abandon the creation of the International space station was discussed. This proposal was rejected by a margin of only one vote: 215 votes for refusal, 216 votes for the construction of the station. And 2 September 1993, Vice-President of the USA Albert Gore and Prime Minister Viktor Chernomyrdin announced a new project a truly international space station. From this moment on, the official name of the station became "international space station".

The main purpose of the ISS was the possibility of conducting on-station experiments that require unique conditions of space flight, microgravity, vacuum, cosmic radiation, is not attenuated by the earth's atmosphere. Main research areas include biology, physics, astronomy, cosmology and meteorology. The research conduct using scientific equipment, mainly located in specialized scientific modules laboratories, a piece of equipment for experiments requiring vacuum, mounted outside the station, outside the containment [3].

The international nature of the ISS project contributes to the organization of joint scientific experiments. The most widely develop such cooperation European and Russian research institutions under the auspices of ESA and the Russian Federal space Agency of Russia [4]. Known examples of such cooperation are the experiments "Plasma crystal", devoted to the physics of dusty plasma, and conducted by the Institute for extraterrestrial physics, max Planck Society, the Institute of high temperatures and the Institute of problems of chemical physics RAS, as well as a number of other scientific institutions of Russia and Germany, biomedical experiment "Matryoshka-R" in which to determine the absorbed dose of ionizing radiation are used mannequins equivalents of biological

objects created in the Institute of biomedical problems of RAS and the Cologne Institute for space medicine. The Russian side also is a contractor in the conduct of contractual experiments ESA and the Japanese aerospace exploration Agency. For example, Russian cosmonauts have conducted tests of experimental robotic system ROKVISS, developed at the Institute of robotics and mechatronics, located in Webling, near Munich, Germany.

The main problem which the ISS has it is its maintenance [5]. Always something needs to be fixed at the station, or other technical works must be carried out.

Despite all the complexity of the design of the ISS, most of the tools on it are made so that layperson could hold some technical work. Of course, each astronaut is a professional, but he is not to do everything and his skills may not be enough to perform a particular maintenance activity. But especially complicated repairs performed outside the International comic station, as it requires going into open space. Such each withdrawal is planned for a long time and worth a certain amount of money. That is why at the present time considers the options of sending into space special robots, which will be managed remotely and will be able to replace the man in time outside activities.

At the moment attend great attention to the development of the international space station. Planned are further improvements laboratories and delivery of new equipment for the experiments, the number of which will increase which will lead to the rapid development of science and space exploration.

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Titanium in Spacecraft

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Aerospace and space industry has traditionally been a pacemaker for development and introduction of new materials systems and production technologies. Probably no other metal is more closely associated with aerospace than titanium.

Titanium is a rather new metal and is, probably the last addition to the comparatively small group of structural materials for different constructions. Along with iron, aluminum, magnesium, copper, and nickel, it becomes one of the essential metal materials for modern spacecraft, as its reserves in the Earth’s crust are rather big [1].

The strength of the titanium alloys varies over a wide range. This is because the properties are dependent on the alloy composition and heat treatment. However, the specific strength properties of titanium alloys are superior to the other materials (expect carbon- epoxy composite), and for this reason they are good materials to use in aircraft structures required to carry high loads, such as airframe components, undercarriage parts, and wing boxes.