Az emberes űrrepülés múltja, jelene és jövője

Farkas Bertalan ny. dandártábornok, űrhajós

58. Közgazdász-vándorgyűlés
The «Mir» Space Station
1986 г. – 2001 г.

- Progress cargo spaceship, 7 tonnes
- Kvant module, 14.3 tonnes
- Spektr module, 18.4 tonnes
- Mir Base Block (Core), 31.7 tonnes
- Kristall module, 18.2 tonnes
- Kvart 2 module, 20.5 tonnes
- Multiple Docking Adapter, 3.2 tonnes

Total mass of Mir Station, tonnes: 135
Number of Modules: 7
Participants in the ISS project - 15 countries

The beginning of the ISS deployment – 1998

ISS USOS - deployment completed in 2011

ISS RS - deployment will end with the integration of the Scientific and Energy Module

American segment:
- mass – 347 τ
- volume – 774 m³

Russian Segment:
- mass – 87 τ
- volume – 299 m³

ISS as a whole:
- mass – 434 τ
- volume – 1073 m³

Crew – 6 people.

The weight of the delivered scientific equipment is 54 tons

Number of experiments carried out - 2100

Planned end of operation: 2024 - 2028.

The first modules operating time will be 26 years in 2024
Затраты времени на выполнение научной программы в период экспедиций МКС-48/49, 49/50, 50/51 и 51/52

Время на выполнение научной программы по планам полета и докладу экипажа

Task List – сеансы КЭ, выполненные в личное время по докладу экипажа
Chronology of human spaceflight (USSR, Russia)

1 stage
Accumulation of knowledge about space environment, development of human space flight engineering

2 stage
Conduct of research in various scientific areas, creation of space vehicle utilization directions and further improvement of human space flight engineering

3 stage
Execution of scientific research, transition to practical utilization of the near-Earth space
Manned stations in the near-Earth orbit

1971  0.5 year  Salyut-1
1973  6 years  Skylab (USA)
1974  0.6 year  Salyut-3 («Almaz»)
1974  2 years  Salyut-4
1976  1.3 years  Salyut-5 («Almaz»)
1977  5 years  Salyut-6
1982  9 years  Salyut-7
1986  15 years  Mir
1998  18.5 years  ISS
2011  6.5 years  Tiangon-1 (China)
2016  1 year  Tiangon-2 (China)

Effectiveness of scientific research on space stations directly depends on composition of on-board research facilities and duration of their operation.
Results of the implementation of programs of scientific and applied research and experiments on the ISS RS

- Fundamental space research
- Medico-biological research
- Technological research
- Remote sensing of the Earth

- In timeframe from year 2000 to 2016 more than 25000 sessions have been completed of 394 experiments, including joint research experiments and commercial ones.
- More than 1000 publications have been placed in leading scientific magazines in Russia and abroad. More than 50 patents have been obtained.
ПЕРСПЕКТИВНЫЙ ПИЛОТИРУЕМЫЙ ТРАНСПОРТНЫЙ КОРАБЛЬ
NEW GENERATION ADVANCED CREW SPACE VEHICLE

RSC Energia is designing FEDERATION Crew Transport Vehicle
Destination: flights beyond LEO and to the ISS
Launch site: Vostochny cosmodrome
First launches: unmanned test flight – 2021
                manned flight – 2023
SUPER-HEAVY LAUNCH VEHICLES AT VOSTOCHNY COSMODROME

**Beginning of the flights to the Moon – before 2030**

Super-heavy launcher - 100 t

*Flights to the Moon*

Landing

**Advanced exploration missions to the Moon and Mars**

Super-heavy launcher - 200 t

*Lunar Outpost*

*Flights to Mars*
Strategic goals of cosmonautics

Improvement life on the Earth

Expansion of the Earth’s life borders

Search of extraterrestrial life
Crew member’s role in space programs implementation

Basic advantages of human spaceflight over robotic spacecraft utilization:

- Human acts much more effective than automatic machinery in off-nominal situations and in hardly predictable conditions of spaceflight.

- Owing to crewmembers’ activity the assembly, repair, and maintenance of a unique scientific and service equipment are ensured in flight.

- Human in space plays the role of a researcher and a test pilot, who provides flexibility of research methods application, execution of research in an interactive mode.

- Possibility of experimental methods and procedures improvement and specification, as well as involvement of additional resources and means into the research process directly during spaceflight is provided.
First Congress Attendees: (back, left to right)
Oleg Makarov, Sultan al-Saud, Edgar Mitchell, Rusty Schweickart, Alexei Leonov, Vladimir Remek, Georgi Beregovoi, Jean-Loup Chretien, Dumitru Prunariu, Byron Lichtenberg, Pham Tuan, Zugderdemidyn Gurragchaa, Sigmund Jahn, Bertalan Farkas, Anatoli Beregovoi, Vladimir Soloviev. (front row, left to right) Alexei Yelesiev, Loren Acton, Vladimir Lysakov, Arnoldo Tamayo-Mendez, Alan Bean, Nikolai Rukavishnikov.
Not pictured: Miroslaw Hermaszewski, James Irwin, Georgi Ivanov
Na, erre még kapható lennék!