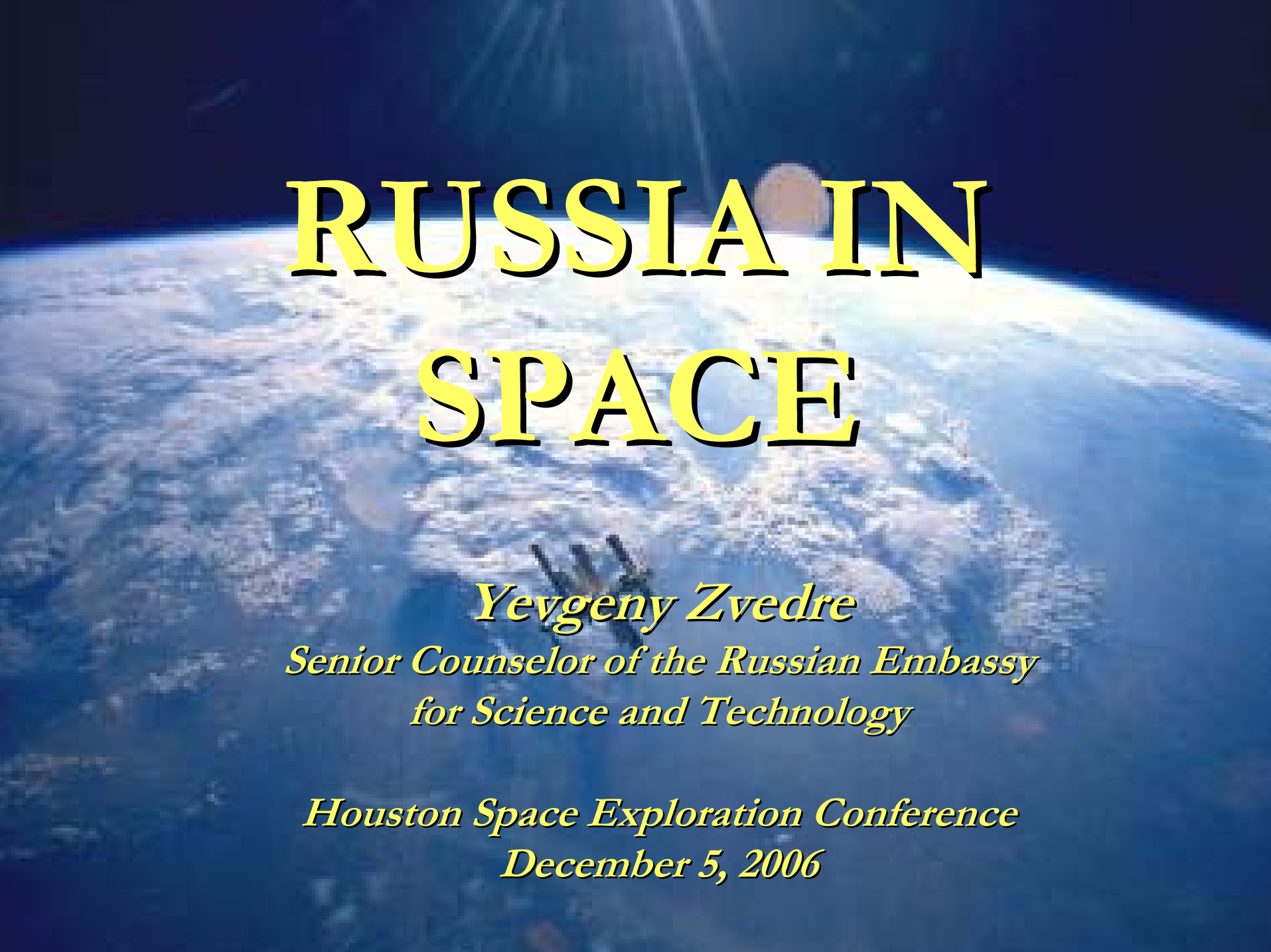

RUSSIA IN SPACE

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Houston Space Exploration Conference
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Federal Space Program 2006 – 2015:

- Environmental monitoring, mitigation and management of natural and man-made disasters.
- Provision of global communications and direct television broadcasting as well as high-precision global navigational and positioning services for civilian customers all over the world.
- Implementation of the international agreements on assembly and exploitation of the International Space Station (ISS) and
- on the other space exploration programs.
- Extensive development of basic space science and advanced space technologies.
- Provision of comprehensive remote sensing and hydro-meteorological data for the country's economic requirements.
- Further development of manned space exploration programs.
- Extensive development of ground space infrastructure.

FSP-2015: space applications

- 26 spacecraft for fixed communications and direct TV broadcasting.
- 12 spacecraft for mobile personal communications in geostationary and elliptical orbits.
- System of remote sensing based on “Resurs-P” satellites with high (less than 1 m) resolution panchromatic imagery.
- Constellation of meteorological satellites: include 2 geostationary space platforms “Electro” and a number of medium-earth orbit meteorological satellites “Meteor-M”.
- Specialized “Canopus-B” spacecraft for earthquake forecasting.

FSP-2015: space research

- "Fobos -Grunt" - remote and direct probing of the Mars satellite, Fobos, and to deliver to the Earth its soil –
- planned for 2009.
- "Moon - Globe" - to acquire data on the internal structure of the Moon and, in particular, its crater Itkena on the south pole, and to investigate natural resources and the influence of electromagnetic radiation - planned for 2012.
- "Venus-D" - to measure chemical composition of the Venus atmosphere, to take pictures of the surface, to determine the mineral structure and to make exact measurements of temperature, pressure, radiation, characteristics of the environment and seismic activity of the planet –
- planned for 2016.
- Program of the space based “SPECTRUM” observatories for astronomical and astrophysical research.

FSP-2015: INTERNATIONAL COOPERATION

- Russia's primary international obligation – completion of ISS assembly.
- Next step – launch of the Multi-Purpose Laboratory Module in 2009.
- After 2009 – full-scale scientific activities onboard ISS to finalize technologies that are key for the future manned space flights.
- Completion of the ISS in an agreed configuration as well as operation and targeted use of the Station in the second decade of 21st century - key factor for further successful development of manned astronautics and future flights to the planets of the Solar system.
- Lessons for the future.

Concept of manned space exploration for the years 2006-2040

2006-2015 – FSP-2015 focused on assembly of the Russian segment of the International Space Station which is planned to be completed by 2011. *Soyuz* and *Progress* ships will continue to deliver crews and cargoes to the orbit. ISS – research outpost.

2016-2025 – completion of the ISS Program and probable construction of a new facility with a more highly inclined orbit. The proposed inclination -70 degrees.

2025-2030 – possible interplanetary missions. If such a decision is made these projects will be carried out in co-operation with international partners.

Development of crew transportation systems

- Up to 2010 - upgrading of the existing *Soyuz* and *Progess* spacecraft-launcher systems in partnership with ESA.

- Tasks to be implemented during further employment of the upgraded *Soyuz* and *Progress* vehicles:
  - to satisfy needs of the near Earth flights including servicing existing and future space stations and,
  - to determine and shape systems of the next generation reusable manned space vehicle, which will be used for interplanetary expeditions.
  -

- Perspective Crew Transportation System (PCTS)
  - plans for the PCTS are yet to be defined
  - *"Clipper"* concept manned vehicle developed by the "Energia" as a possible variant of the PCTS
  - A joint program with the ESA is underway to determine modalities of further work on the next generation manned vehicle


Russia and the US –
30 years in space
together


new opportunities –
tremendous challenges