

A satellite with large solar panels is shown in space, with the Earth's horizon and a bright sun visible in the background. The satellite is the central focus, with its solar panels extending outwards. The Earth's atmosphere is visible as a thin blue and orange line at the bottom of the frame.

Overview

US and Russian Cooperation in Space Biology and Medicine

Svetlana Hanson, Tietronix Software, Inc.



Editorial Team

**C.F. Sawin, S.I. Hanson,
N.G. House (USA)
I.D. Pestov (RF)**



History

- 1965 – NASA and USSR Academy of Science agreement
- 1971 and 1987 – Bilateral (US-USSR) intergovernmental agreements
- 1975 г. – First joint publication “*The Foundations of Space Biology and Medicine*”
- 1994-2008 – Second joint publication “*Space Biology and Medicine,*” four volumes
- 2009 – Fifth volume of the second joint publication : “*US and Russian cooperation in space biology and medicine*”



FORMS OF COOPERATION

- Contacts within bilateral working groups and international organizations
- Exchange of scientific data and practical experience
- Joint biomedical research
- Coordinated approaches to the types of and methods for in-flight medical support
- Cooperation during implementation of the Bion, Apollo-Soyuz, Shuttle-Mir, NASA-Mir, International Space Station (ISS) projects
- Harmonization of the structure and contents of joint publications





Volume V



- **New scientific evidence complement previously published data**
- **Summary of scientific data concerning the results of recent research**
- **Combined effort of 54 specialists**



CHAPTER 1



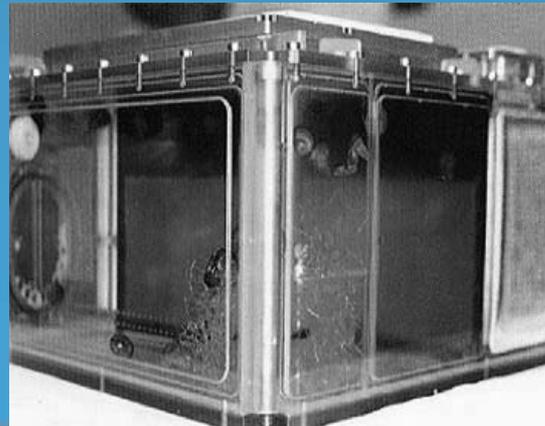
Biological Research in Space Flight

K. A. Souza (US), E. A. Ilyin (RF), V. N. Sychev (RF),
G. C. Jahns (US)



CHAPTER 1

- Substantial amount of new information on the results of biological research in space
- Combines descriptions of the quantity and diversity of research





CHAPTER 2



Review of Exobiological Research

A. Yu. Rozanov (RF)



CHAPTER 2



- **Development of stipulations in the Chapter 6 of the first volume**
- **Foundation for assessing signs of life in the universe**
- **Extensive bibliography**



CHAPTER 3



Biomedical Research in Space Flight

N. G. House (US), G. I. Samarin (RF)



CHAPTER 3



- **Detailed information about the participants in space missions**
- **Details of the primary objectives and methods for conducting biomedical research**
- **Information is analyzed from the perspective of the evolution of biomedical research**



CHAPTER 4



Extravehicular Activity

V. P. Katuntsev, Yu. Yu. Osipov (RF), M. Gernhardt (US),
J. Dervay, K. S. Thomas, J. M. Reeves (US)



CHAPTER 4



- Adds to previously published data (Volume 2, Chapter 14 and Volume 3, Book 2, Chapter 24)
- Extensive reference materials presented and analyzed



Chapter 5



The Habitable Environment of the ISS

V. M. Baranov(RF), J. T. McCoy (US), A.N. Agureev(RF)



Chapter 5



- Encompasses a broad spectrum of topics that previously served as the basis for Volume 2
- Contains 7 sections describing and analyzing the characteristics of the ISS habitable environment



Chapter 5

Section 1. Microclimate, Acoustic Environment, and Lighting Conditions

R. I. Bogatova (RF), C.S. Allen (US), I. V. Kutina (RF), J. R. Goodman (US)

Section 2. Toxicology of the International Space Station Atmosphere

L. N. Mukhamedieva (RF), J. T. James (US), Z. V. Aksel-Rubinstein, G. I. Solomin (RF)

Section 3. Microbiology of the International Space Station

*N. D. Novikova (RF), D. L. Pierson (US), S. V. Poddubko, Ye. A. Deshevaya (RF),
C. M. Ott, V. A. Castro, R. J. Bruce (US)*

Section 4. Radiation Safety of International Space Station Crews

V. M. Petrov (RF), F. A. Cucinotta (US)



Chapter 5

Section 5. Water Supply on the International Space Station

*V. M. Skuratov (RF), P. D. Mudgett (US), L. S. Bobe, P. O. Andreichuk (RF),
J. R. Schultz (US)*

Section 6. Nutrition for International Space Station Crews

A. N. Agureev (RF), V. Kloeris, S. R. Zwart, S. M. Smith (US)

Section 7. Personal Hygiene for International Space Station Crewmembers

G. A. Shumilina (RF) and J. D. Villarreal (US)



Chapter 6



Medical Support for Crewmembers of the ISS

V.V. Bogomolov (RF), J. M. Duncan, A. E. Sargsyan,
S. L. Pool (US)



Chapter 6



- Contains entirely new material
- Summarizes cooperation between Russia and the U.S. during the NASA-Mir program
- Outlines interactions among space agencies involved in the creation and operation of the ISS



Chapter 7



Medical Support for Interplanetary Human Space Flights

A. I. Grigoriev, A. N. Potapov (RF), J. A. Jones, T. A. Sullivan,
R. A. Scheuring (US)



Chapter 7



- Specific prospects for human exploration of the Moon and Mars from the perspective of medical support
- Risks relating to missions beyond Earth orbit
- Possible scenarios for overcoming these risks



Conclusion

- The accumulated experience has enriched world science
- Serves as a basis for the development of wider scientific collaboration
- The materials will be viewed by experts in space biology and medicine as the primary sources of information



Cooperation continues...

