
IAA 13th Humans In Space Symposium

Fira, Santorini, GREECE
May 20-25, 2000

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SESSIONS

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[Session B1](#): Future Challenges

[Session C1](#): Neuro 1: Posture Control and Eye-Head Coordination

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[Session C2](#): Neuro 2: Arm Movement and Manual Control

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Session A1 : CARDIOVASCULAR FUNCTION I: HEAD-DOWN BEDREST, A GROUND-BASED MODEL OF SPACE FLIGHT

Co-Chairs

A. Pavy-Le Traon, Toulouse, France

R. Hughson, Ontario, Canada

Rapporteur

F. Baisch, Cologne, Germany

Clinical Effects of Thigh Cuffs During A 7 Day 60 Head-Down Bed Rest

Anne Pavy-Le Traon, Alain Maillet, Pascale Vasseur-Clausen, Marc-Antoine Custaud, Irina Alferova, Claude Ghariv, Jacques-Olivier Fortrat

Effect of the Thigh Cuffs on the Carotid Diameter, Jugular Vein Section, and Facial Skin Edema. HDT Study

P. Arbeille, S. Diridillou, S. Herault, G. Fomina, J. Roumy, I. Alferova

Gender Differences in Central Vein Pressure-Volume and Cardiac Function After 4-Hours Head Down Tilt

R.L. Hughson, J.K. Shoemaker, M.J. MacDonald, A. Gelb, M.S. Kassam, R.L. Bondar

Effect of a Venotonic agent on the main arteries and veins during a 5 day HDT

J. Roumy, S. Herault, N. Tobal, S. Besnard, Ph. Arbeille

Central Venous Pressure During Microgravity: Phenomena, Paradoxes, and Hypotheses

V.M. Baranov, A.N. Kotov, M.A. Tikhonov, Zh.A. Donina, I.N. Lavrova, M.A. Pogodin

A device for Workload Measurement during Extravehicular Activity

Philip C. Njemanze

Session B1: FUTURE CHALLENGES

Co-Chairs

M. Dudley-Rowley, Fairbanks, Alaska

J. Arnould, Paris, France

Rapporteur

M. Reichert, Cologne, Germany

Reflexions on Human Presence in Space

Jacques Arnould

The Long-Duration Mission: Not Just Duration

M. Dudley-Rowley, S. Bishop, K. Farry, T. Gangale

How we Might Succeed in a Mars Venture Prior to Genetic Engineering

William J. Rowe

The Future of Manned Spaceflight

Michael Reichert

Volcanic Hot Springs as Clues to the Precipitation of Precambrian Iron Formation, Origin of Life, and Terraforming Mars

E.I. Robbins, C. Kourtidou-Papadeli, H.H. Hanert, Motoaki Sato, A.S. Iberall, E.T. Slonecker

Session C1: NEURO-1: POSTURE CONTROL AND EYE-HEAD COORDINATION

Co-Chairs

F. Black, Portland, OR

G. Clement, Toulouse, France

Rapporteur

G. Baroni, Milan, Italy

Unimpaired Neuro-Adaptive Plasticity in an Elderly Astronaut

William Paloski, F. Owen Black, E. Jeffrey Metter

Motor Coordination in Weightless Conditions Revealed by Long-Term Microgravity Adaptation

Guido Baroni, Alessandra Pedrocchi, Giancarlo Ferrigno, Jean Massion, Antonio Pedotti

Postural Control Responses Sitting on Unstable Board During Visual Stimulation

Y. Mizuno, M. Shindo, S. Kuno, T. Kawakita, S. Watanabe

Invariant Aspects of Human Locomotion in Different Gravitational Environments

Alberto Minetti

Behavioral Evidence that Neural Strategies Evolve During Space Flight for the Maintenance of Gaze Stability and Ocular-Motor Per-Forman

M.F. Reschke

Effect of Cosmonauts Vestibular Training on Motion Sickness Susceptibility and Vestibulo-Ocular Reflex

G. Clement, M. Parant, O. Deguine, M.C. Costes-Salon, P. Vasseur-Clausen, A. Pavy-Le Traon

Session A2: CARDIOVASCULAR FUNCTION II: FLIGHT EXPERIMENTS AND LABORATORY STUDIES

Co-Chairs

O. Atkov, Moscow, Russia

I. Biaggioni, Nashville, Tennessee

Rapporteur

P. Arbeille, Tours, France

Noninvasive Examination of Cardiovascular System During Parabolic Flights

O. Atkov, P. Vaida, B. Cholley, T. Sakhnova, M. Saltykova, A. Capderou, L. Titomir, V. Trunov, E. Blinova, O. Bailliart, I. Desormes

Adaptation of the Autonomic Nervous System to Spaceflight. Relevance to Orthostatic Intolerance

Andrew Ertl, Andre Diedrich, Italo Biaggioni, David Robertson

Vascular Hemodynamics and Orthostatic Tolerance in Cosmonauts of the French-Russian Flight EO-25 on Board the MIR Station

F. Louisy, G. Fomina, I. Alferova, N. Boudarine, L. Eyharts, A. Kotovskaia

Body fluid distribution under LBNP

Friedhelm J. Baisch

Vestibular Otoliths Modulate Sympathetic Outflow According to the Direction of Tilt of the Gravito-inertial Vector

Horacio Kaufmann, Italo Biaggioni, Andrei Voustaniuk, Andre Diedrich, Fernando Costa, Martin Gizzi, Robert Clark, Bernard Cohen

System Identification of Dynamic Closed-Loop Control of Total Peri-Pheral Resistance by Arterial and Cardiopulmonary Baroreceptors

A. Nikolai Aljuri, Nenad Bursac, Robert Marini, Richard J. Cohen

Session B2: ASTROBIOLOGY

Co-Chairs

R. Gerzer, Cologne, Germany

B. Berry, Moffett Field, California

Rapporteur

P. Stabekis, Washington, DC

Astrobiology: The Study of Life in the Universe

Scott Hubbard, William E. Berry, Harry McDonald

Human Missions to Mars: A Planetary Protection Perspective

P.D. Stabekis, J.D. Rummel

Critical Issues in Connection with Human Planetary Missions: Protection of and from the Environment

G. Horneck, R. Facius, G. Reitz, P. Rettberg, C. Baumstark-Khan, R. Gerzer

Exobiology in the ESA Life Sciences Programme

R.D. Schmitt, P. Clancy

Session C2: NEURO-2: ARM MOVEMENT AND MANUAL CONTROL

Co-Chairs

J. McIntyre, Paris, France

R. Roll, Marseille, France

Rapporteur

R. Seidler, Tempe, Arizona

Aimed Arm Movement in Weightlessness

R. Roll, K. Popov, J.P. Roll

Arm End-Point Trajectories Under Normal and Micro-Gravity Environments

C. Papaxanthis, T. Pozzo, J. McIntyre

Arm Pointing Adaptation and Cue Utilization

R.D. Seidler, J.J. Bloomberg, G.E. Stelmach

Changed Visuomotor Transformations During and After Spaceflight

J. Sangals, H. Heuer, D. Manzey, B. Lorenz

Internal Models for Ball Catching Revealed in Microgravity

J. McIntyre, M. Zago, M. Venet, A. Berthoz, F. Lacquaniti

Changes of the Number-Recall-Related Component in the Event-Related Potentials During Head-Down Tilt

J.H. Wei, L. Zhao, W. Ren, G.D. Yan, D. Li, M. Yang

Session A3: ANALOGOUS ENVIRONMENTS

Co-Chairs

J. Wood, Houston, Texas

V. Baranov, Moscow, Russia

Rapporteur

S. Bishop, Galveston, Texas

Ground-Based Experiments with Prolonged Isolation as a Model of Space Flight (Advantages and Limitations)

V.M. Baranov

Efficacy of Flywheel Resistance Exercise as a Countermeasure During 110 Days of Experimental Confinement

B.A. Alkner, H.E. Berg, D. Sayenko, I.B. Kozlovskaya, P.A. Tesch

Brain Peptides, Stress and Behavior: A Potential Intervention?

J. Wood, T.M. Phillips, P. Klemes, D.J. Lugg

A One Year Polar Scientific Expedition as an Analog to a Mars Mission

G.R. Leon, D.S. Ones, J. Shelton

The Effects of Size and Heterogeneity of Crew and Mission Duration on the Deviant Behavior and Performance of Team Personnel in Space and Polar Environments

P. Nolan, M. Dudley-Rowley

Relationship of Psychological and Physiological Parameters During a 350KM Arctic Ski Expedition: A Case Study

S.L. Bishop, L.C. Gobler, O. Scholl

Session B3: FROM THE MIR/SPACEHAB TO ISS

Co-Chairs

G. Ruyters, Bonn, Germany

A. Guell, Toulouse, France

Rapporteur

T. Russomano, Porto Alegre, Brazil

17 Years in Space Physiology research on board of Sailout 7 and Mir Stations: an example of French/Soviet-Russian cooperation

Antonio Guell, Adilya Kotovskaia, Claudie Andre-Deshays

Crew Training and Operations of Physiology Payloads Aboard Spacelab Missions

Robert Thirsk, Daffyd Williams, Richard Linnehan

The German Space Life Sciences Program: "Best Science" and Application-Oriented Research in International Competition and Cooperation

G. Ruyters, P. Graf

Microgravity Laboratory the Brazilian Space Life Science Research Center

T. Russomano, Dario Francisco Guimaraes de Azevedo

The Experiment Implementation Process

L. Miller, C. Haven, S. McCollum, A. Lee, M. Kamman, D. Baumann, M. Anderson, M. Buderer

The Human Space Life Sciences Critical Path Roadmap Project

C.F. Sawin, J.B. Charles, R. White, L. Leveton

Session C3: NEURO-3: CANAL-OTOLITH INTERACTIONS AND PERCEPTION

Co-Chairs

D. Angelaki, St. Louis, Missouri

J. McIntyre, Paris, France

Rapporteur

S. Watanabe, Daido, Japan

Neural Discrimination of Gravity and Translational Accelerations

D.E. Angelaki, J.D. Dickman, B.J.M. Hess

Central Vestibular Neuron Processing of Gravity-Dependent and Gravity-Independent Receptor Signals

J.D. Dickman, D.E. Angelaki

The Internal Reference Frames for Representation and Storage of Visual Information: The Role of Gravity

J. McIntyre, M. Lipshits, M. Zaoui, A. Berthoz, V. Gurfinkel

Does Gravity Play an Essential Role in the Asymmetrical Visual Perception of Vertical and Horizontal Line Length?

M. Lipshits, J. McIntyre, M. Zaoui, V. Gurfinkel, A. Berthoz

Does the Endolymph Pass Through the Base of the Cupula ?

H. Jijiwa, N. Watanabe, T. Hattori, F. Matsuda, M. Hasiba, Y. Mizuno, M. Shindo, S. Watanabe

Effects of Vestibular Nerve Transection on Fish Otolith Growth

R. Anken, E. Edelman, H. Rahmann

Session D1: EDUCATION AND OUTREACH FOR HUMANS IN SPACE

Co-Chairs

M. MacLeish, Atlanta, Georgia

R. Phillips, Fort Collins, Colorado

Rapporteur

B. J. McClain, Washington, DC

The International Space University Experience in Space Education and Studies

Oleg Atkov, Francois Becker, Nikolai Tolyarenko

The Mirman School of Gifted Students

Richard Boolootian

National Space Biomedical Research Institute Education and Outreach Program

M. MacLeish, N. Moreno, B. Tharp, G. Jessup, M. Clipper

Research is not Complete Until the Public is Informed

K.L. Wilmoth, G.R. Coulter, B.J. McClain, R.W. Phillips

The Living Universe, An Adventure in Learning

R.A. Grymes, K.L. Wilmoth

Session A4: METABOLISM

Co-Chairs

L. Putcha, Houston, Texas

V. Polyakov, Moscow, Russia

Rapporteur

A. Maillet, Toulouse, France

Human Thermohomeostasis Onboard "MIR" and in Simulated Microgravity Studies

V.V. Polyakov, N.G. Lacota, A. Gundel

Intestinal Absorptive Capacity and Permeability in Microgravity

S. Somasundaram, M. Stelzner

Effects of Simulated Microgravity on Hepatic Metabolism

C.A. Rivera, L. Putcha

Effect of Various Stress-Tests on Plasma Catecholamine Levels During Space Flight of the First Slovak Cosmonaut on Station MIR

R. Kvetnansky, J. Koska, K. Pacak, T. Hoff, L. Ksinantova, E. Kobzev, V.B. Noskov, L. Macho, A.I. Grigoriev, M. Vigas

Investigation of Human Metabolic Shifts Due to Simulated Microgravity During Physical Load Test

L. Buravkova, I. Popova, I. Zabolotskaya, I. Larina

Session B4: BIOLOGY

Co-Chairs

H. Schatten, Columbia, Missouri

E. Horn, Ulm, Germany

Rapporteur

M. Ross, Albuquerque, New Mexico

Lymphocyte Locomotion and Signal Transduction in Modeled Microgravity Is Affected By Differential Expression of Calcium Independent Protein Kinase C Isoforms

A. Sundaresan, D. Risin, N.R. Pellis

The Effects of Altered Gravity Conditions on Cytoskeletal Organization and Mitochondria in Cultured Cells

H. Schatten, A. Chakrabarti

Crickets In Space

E. Horn, H. Agricola, S. Forster, G. Kamper, P. Riewe, C. Sebastian

Vestibular Macular Sensory Hair Cell Plasticity in Space: A possible Role for Backpropagation and Feedback Microcircuits in Neuronal Adaptation to Weightlessness

Muriel Ross

Proposal for the Development of a New Ground-Based Goldfish Model to Evaluate Pharmacodynamic and Pharmacokinetic Effects of Drugs for Motion Sickness in Different Gravity

Claire Lathers, Chiaki Mukai, Cedric M. Smith, Paul L. Schraeder

The Role of the Calpain-System in Skeletal Muscle Myofibrillar Protein Composition During Exercise-Induced Muscle Damage

A.N. Belcastro, C. G. Ball

Session C4: MICROGRAVITY - RELATED BONE LOSS

Co-Chairs

V. Schneider, Washington, DC

Y. Kumei, Tokyo, Japan

Rapporteur

C. Mukai, Houston, Texas

Effects of Sciatic/Femoral Neurectomy on the Bone Mineral Density of Femora and Tibiae in Young Growing Rats: A Model of Mechanical Unloading

H. Nakamura, S. Morita, Y. Kumei, H. Shimokawa, K. Shinomiya

The Tetraplegic Patient as a Model of Microgravity-Related Bone Loss

M.M. Daphtary, J.R. Shapiro, J.N. Caminis, J.T. Toerge, K. Burman, V. Schneider, L. Shultheis

Sex Steroids Improve Anchoring of Human Bone Cells to the Organic Bone Matrix

C. Kasperk, U. Sommer, R. Ziegler, A. Lieder, B. Bundschuh

Bone Architecture Assessment with Measures of Complexity

W. Gowin, P. Saporin, J. Kurths, D. Felsenberg

Effects of Partial Weightbearing, Dynamic Loading and Ibandronate as Countermeasures to Bone Loss in the Suspended Rat

M. M. Daphtary, J.R. Shapiro, C. R. Ruff, J. Ruiz, S. A. Bloomfield, L. Schultheis

Real Time Analysis of Bone Demineralization/Calcium Metabolism Biomarkers Using a Miniature TOF Mass Spectrometer

Richard S. Potember, Wayne A. Bryden

Session A5: PERFORMANCE/HUMAN FACTORS - 1

Co-Chairs

N. Kanas, San Francisco, California

D. Manzey, Hamburg, Germany

Rapporteur

D. Newman, Cambridge, Massachusetts

Visuo-Motor Tracking Performance During Spaceflight

D. Manzey, B. Lorenz, H. Heuer, J. Sangals

Face to Face Communications in Space

Malcolm M. Cohen

Astronaut Adaptation Across the Spectrum of Gravity

D.J. Newman, R.H. Wu

Noninvasive Video Motion Capture and Optimal Control Methods for Quantifying IVA and EVA Activities

D. Metaxas, D. Newman, N. Badler

Session B5: RADIATION - 1

Co-Chairs

J. Wilson, Hampton, Virginia

G. Reitz, Cologne, Germany

Rapporteur

P. Denkins, Houston, Texas

Issues in Deep Space Radiation Protection

J.W. Wilson, J. L. Shinn, R.K. Tripathi, R.C. Singleterry, M.S. Cloudsley, W. Schimmerling, F.A. Cucinotta, G.D. Badhwar, M.Y. Kim, F.F. Badavi, J.H. Heinbockel, J. Miller, C. Zeitlin, L. Heilbronn

Radiation Measurements in Near Earth Orbit

G. Reitz, R. Beaujean, J. Kopp

LIULIN-4 Type Systems and their Use on Board of ISS for the purpose of the Radiation Risk Assessment

Ts. Dachev, B. Tomov, Yu. Matviichuk, Pl. Dimitrov, J. Lemaire, Gh. Gregoire, M. Cyamukungu, H. Schmitz, G. Reitz, R. Beaujean, V. Petrov, V. Shurshakov

Radiation Transport Modeling and Assessment to Better Predict Radiation Exposure, Dose, and Toxicological Effects to Human Organs on Long Duration Space Flights

P. Denkins, G. Badhwar, V. Obot

Intensity/Frequency Indicator for Detection in Space The High Values of the Incident Solar or Laser Optical Radiation in Comparison with the Appropriate Maximum Permissible Exposure

S. Tsitomeneas, B. Petropoulos

Session C5: ARTIFICIAL GRAVITY - 1

Co-Chairs

L. Young, Cambridge, Massachusetts

K. Yajima, Tokyo, Japan

Rapporteur

S. R. Simonson, Moffett Field, California

The Effect of +GZ Acceleration on Monkey Cardiac Rhythm Autonomic Regulation During Head-Down Bedrest

A.M. Badakva, N.V. Miller, S.N. Riazanski

Effective of Periodical Centrifugation of the Monkeys During the 4-Week Head-Down Tilt

V.I. Korolkov, I.B. Kozlovskaya, A.R. Kotovskaya, V.P. Krotov, V.I. Lobachik

Usefulness of Daily +2Gz Load as a Countermeasure Against Physiological Problems During Weightlessness
Ken-ichi Iwasaki, Tsuyoshi Sasaki, Kaname Hirayanagi, Kazuyoshi Yajima

The Influence of Passive Acceleration and Exercise +Acceleration on Work Capacity and Orthostasis
S.R. Simonson, S.A. Cowell, J.M. Stocks, H.W. Biagini, J.M. Vener, S.N. Evetts, K.N. Bailey, J. Evans, C. Knapp, J.E. Greenleaf

Session D2: PRE AND POST INVESTIGATIONS BEFORE AND AFTER LONG TERM SPACE-FLIGHTS

Co-Chairs

A. Güell, Toulouse, France

L. Voronin, Star City, Moscow

Stretch Reflex and Ankle Joint Stiffness After Long Term Spaceflight

D. Lambertz, Ch. Perot, R. Kaspranski, F. Goubel

Posturo Kinetic Activities Before and After Long Term Space Flight

Ph. Dupui, R. Kaspranski, R. Montoya, M.Cl. Costes-Salon

Mental Representation of Gravity During a Locomotor Task

Th. Pozzo, P. Stapley, A. Berthoz, R. Kaspranski

Syncope After Long-Term Spaceflights

A. Maillet, D. Sigaudou-Roussel, J.O. Fortrat, M.A. Custaud, A. Guell, R. Kaspranski, R.L. Hughson, Cl. Gharib

Bone Densitometry After Long Term Space Flight

Ch. Alexandre, Ph. Collet, L. Vico

Session A6: PERFORMANCE/HUMAN FACTORS - 2

Co-Chairs

N. Kanas, San Francisco, California

D. Manzey, Hamburg, Germany

Rapporteur

D. Newman, Cambridge, Massachusetts

Human Interactions in Space: Results from Shuttle/MIR

N. Kanas, V. Salnitsky, E.M. Grund, D.S. Weiss, V. Gushin, O. Kozerenko, A. Sled, C.R. Marmar

Work and Rest Planning as the way of Crew Members Errors Management

A.P. Nechaev, S.I. Stepanova

Team Training for the SFINCSS Long Duration Isolation

R. Kass, J. Kass

Interior Design Implications for NASA's Transit Habitat on Long Term Space Missions

N. Kwallek, H. Woodson, G. Schira

Human Factors in Space and Spaceport Operations

Tim Barth, Donna Blankmann-Alexander

Session B6: RADIATION - 2

Co-Chairs

J. Wilson, Hampton, Virginia

G. Reitz, Cologne, Germany

Rapporteur

L. Narici, Rome, Italy

Multiparameter Analysis of Single Cell By Confocal Microscopy and Recording of Single Cell Exposure with Passive Dosimeters

P. Van Oostveldt, P. Baert, G. Meesen, S. Vangestel, A. Poofijn

"SILEYE-2" Experiment Results

V. Bidoli, M. Cassolino, M.P. DePascale, G. Furano, A. Morselli, L. Narici, P. Picozza, E. Reali, R. Sparvoli, E. Traversa, W.G. Sannita, A. Galper, A. Khodarovich, A. Popov, N. Vavilov, S. Avdeev, M. Boezio, W. Bonvicini, A. Vacchi, N. Zampa, R. Battiston, S. Bartalucci, G. Mazzenga, M. Ricci, O. Adriani, P. Spillantini, G. Castellini, P. Carlson, C. Fuglesang

The Altea Project

V. Bidoli, M. Cassolino, M.P. DePascale, G. Furano, A. Morseeli, L. Narici, P. Picozza, E. Reali, R. Sparvoli, E. Traversa, W.G. Sannita, A. Loizzo, A. Galper, A. Khodarovich, A. Popov, N. Vavilov, S. Avdeev, V.P. Salnitskii, O.I. Shevchenko, V.P. Petrov, K.A. Trukhanov, W. Bonvicini, A. Vacchi, N. Zampa, R. Battiston, S. Bartalucci, G. Mazzenga, M. Ricci, O. Adriani, P. Spillantini, G. Castellini, M. Boezio, P. Carlson, C. Fuglesang

Radiation-Induced Cataract - Quantification Using Digital Scheimpflug Imaging and Impact on Human Space Missions

Z.N. Rastegar, P.Eckart, M. Froemel, A.M. Kellerer, H. Roos

Session C6: ARTIFICIAL GRAVITY - 2

Co-Chairs

V. Baranov, Moscow, Russia

M. Lacour, Marseille, France

Rapporteur

Y. Kumei, Tokyo, Japan

Artificial Gravity as a Countermeasure to Prolonged Weightlessness

Laurence Young, Heiko Hecht, Kathleen Sienko, Lisette Lyne, Carol Cheung, Jessica Kavelaars

Posturo-Locomotor Adaptations To Modified Gravito-Inertial Forces

M. Lacour, V. Bouet, F. Harlay, L. Borel, Y. Gahery

Gravity Stress Elevates the Nociceptive Threshold Level with Immunohistochemical Changes in the Rat Brain

Y. Kumei, K. Toda, Y. Kawauchi, H. Shimokawa, R. Shimokawa, M. Kimoto, A.K. Makita

An Overview of Human Centrifugation - How To Reduce the Side Effects of Short-Arm Centrifuge

K. Yajima, K. Iwasaki, M. Ito, A. Miyamoto, T. Sasaki, K. Hirayanagi

Session A7: PERFORMANCE/HUMAN FACTORS - 3

Co-Chairs

N. Kanas, San Francisco, California

D. Manzey, Hamburg, Germany

Rapporteur

D. Newman, Cambridge, Massachusetts

Transfer Function of the Man-Operator

V. Prisniakov, L. Prisniakova

Working Together: A Needs Assessment for Team Optimization on Joint Russian/Non-Russian Space Projects

M. Dudley-Rowley, J. Kass, T. Gorry, R. Kass, B. Caldwell

Culture as a Latent Threat in Space Station Operations

David Musson

The Effects of Extreme Nutritional Conditions on the Neurochemistry of Reward and Addiction

E.N. Pothos

Integrated Design of a Telerobotic Workstation

Jennifer Rochlis, John-Paul Clarke

Dynamics of Interpersonal Tension on a Simulated International Space Station

Gro M. Sandal

Session B7: LIFE SUPPORT

Co-Chairs

C. Savage, Noordwijk, The Netherlands

G. Ruyters, Bonn, Germany

Rapporteur

C. Christodoulatos, Hoboken, New Jersey

ESA Developments in Life Support Technology: Achievements and Future Priorities

C.J. Savage, G.B.T. Tan, C. Lasseur

Development of a Biological Gravity Independent Grey Water Treatment System for Carbon Removal and Nitrification

C. Christodoulatos, M. Nashashibi-Rabah, G.P. Korfiatis

The C.E.B.A.S. Mini Module: Spaceflight Results as a Base for the Development of Aquatic Bioregenerative Life Support Modules

V. Bluem, F. Paris

Session C7: MUSCLE 1 - BIOLOGICAL MECHANISMS OF MUSCLE ATROPHY IN SPACE

Co-Chairs

R. Thirsk, Houston, Texas

T. Nemirovskaya, Moscow, Russia

Rapporteur
M. Clarke, Houston, Texas

Skeletal Muscle Physiology Investigations Aboard the Life and Microgravity Spacelab Mission
Robert Thirsk

Changes of Muscle Coordination Induced by a Prolonged Spaceflight - A Biomechanical and Electromyographical Study

F. Bodem, G. Antonutto, P. Zamparo, J. Heine, J. Kass, P.E. diPrampo

The Effects of Long-Term Muscle Unloading on The Contractile and Electrical Properties of the Triceps Surae

Yuri Koryak, I. Kozlovskaya, S. Siconolfi, J. Gilbert III

Effect of Long-Term Space Flight on Contractile Properties Human Skeletal Muscle

Yu. Koryak, I. Kozlovskaya, S. Siconolfi, J. Gilbert

Effects of Bedrest on Structural and Metabolic Characteristics of Skeletal Muscles in Rhesus Monkey (As Compared to Space Flight)

B.S. Shenkman, I.N. Belozeroval, T.L. Nemirovskaya

Modulation of Sarcoplasmic Reticulum Cholesterol Content During Mechanical Unloading-Induced Muscle Atrophy

Mark S.F. Clarke, Robert W. Caldwell, Daniel L. Feedback

Session A8: OPERATIONAL MEDICINE

Co-Chairs

V. Morgun, Star City, Russia

B. Harris, Houston, Texas

Rapporteur

A. Pavy-LeTraon, Toulouse, France

Virtual Reality Based Surgical Training for Long Duration Space Missions

Michael Stephanides, Kevin Montgomery, Joel Brown, Jean-Claude Latombe, Stephen Schendel

Medicine in Long Duration Space Exploration: The Role of Virtual Reality and High Bandwidth Telecommunications Networks

Muriel D. Ross

Biomedical and Telemedical Experiments in Space

Doris Hamill, Bernard Harris

In Vivo Identification Sampling Procedure of Air Bubbles using a Miniature Chamber and Selected Specimens and In Vitro Measurement of Air Bubbles by Means of Resonant Frequency Ultrasound

Angelo Karavolos, Michael Powell, Andrew Anayiotos

Session B8: TECHNOLOGY

Co-Chairs

V. Pisacane, Laurel, Maryland

J. McIntyre, Paris, France

Rapporteur

S. Daunert, Lexington, Kentucky

Precision Bone and Muscle Loss Measurements by Advanced, Multiple Projection DEXA (AMPDEXA) Techniques for Spaceflight Applications

H.K. Charles Jr., T.J. Beck, H.S. Feldmesser, T.C. Magee, T.S. Spisz, V.L. Pisacane

Cardiac Tele-Echography by Ultrasound 3D Realtime Acquisition and 2D Reconstruction

N. Tobal, S. Besnard, J. Roumy, S. Herault, JM Pottier, Ph. Arbielle

A 6 D.O.F. Tracker Opto-Inertial Tracker For Virtual Reality Experiments in Microgravity

M. Zaoui, D. Wormell, Y. Altshuler, E. Foxlin, J. McIntyre

Coupling Genetically Engineered Proteins and Microfluidics: Fluorescence Detection on the LABCD

Gary Barrett, Phillip M. Douglass, Brett R. Wenner, L. Lyndon, E. Salins, Marc J. Madou, Sylvia Daunert

Filtering Water Sources for Use in Intravenous Devices (IV) Onboard the Space Shuttle and International Space Stations (ISS)

J.D. Pounds, A. Twyman, P. Currier, K. DiBiase, C. Cortes-Ramos, R. Sumner, A. Schlunt, C. Slaughter, K. Fong

Development of an Advanced Rocket Propellant Handler's Suit

D. Doerr

Session C8: MUSCLE II - COUNTERMEASURES TO MUSCLE ATROPHY OF SPACE FLIGHT

Co-Chairs

P. Tesch, Little Rock, Arkansas

I. Larina, Moscow, Russia

Rapporteur

F. Bodem, Mainz, Germany

Reducing Muscle Deconditioning in Simulated Weightlessness

J.F. Caruso, J.L. Hamill, M. Yamauchi

Resistance Training Using Fly-Wheel Technology Ameliorates Muscle Atrophy Induced by Five WK Lowerlimb Unloading

P.A. Tesch, J.T. Trieschmann, A. Ekberg

Functional Effects of Plantar Stimulation on the Atrophied Soleus Muscle of Rat During Unloading

L. De-Doncker, F. Picquet, M. Falempin

Counteracting Effects of β_2 -Agonist Clenbuterol Administration on Biochemical and Contractile Properties of Unloaded Soleus Fibers of Rat

Laurence Stevens, Carole Ricart-Firinga, Yvonne Mounier

First Application of Functional Electrostimulation for Muscle Training on Board of MIR Space Station

G. Freilinger, W. Mayr, R. Rafolt, M. Bijak, W. Girsch, H. Lanmuller, S. Sauermann, E. Unger, Y. Koryak, B. Shenkman, I. Kozlovskaya

The Content of Growth Hormone and Another Regulators of Protein Turnover in Human Blood in Long Term Space Flight and Head Down Tilt Bed Rest

