



INTERNATIONAL SOCIETY FOR GRAVITATIONAL PHYSIOLOGY

Hosted by Prof. Floris Wuyts

42nd Annual ISGP Meeting in Antwerp
July 2 – 7, 2023



<https://www.isgp-space.org/isgp2023/>

July 03, 2023 - Monday

	Plenary room (M.01)	Poster hall	Parallel room (M0.4)	Parallel room (M0.5)
9:00 – 9:30	Opening word <u>Speakers</u> Frank De Winne, Floris Wuyts, Marc-Antoine Custaud			
9:30 – 11:00	Plenary session “Current Concept” <u>Moderators</u> Brandon Macias and Danielle Greaves <u>Speakers</u> Michael Stenger – “NASA physiological research for human space exploration” Erik Houglund – “Human research program plans on Artemis research”			
11:00 – 11:30	<i>Coffee Break</i>			
11:30 – 12:30	Young Investigator Award <u>Moderators</u> Anna-Maria Liphardt, Catho Schoenmaekers, Rodrigo Coutinho De Almeida <u>Speakers</u> 11:30 Katie Warthen – “Quantification of intracranial tissue, fluids, and ocular structural changes due to long-duration spaceflight” 11:45 Danniella Hurt – “Cephalad fluid shifts associated with neuroprotective alterations in cerebral perfusion and haemostasis independent of systemic oxygenation status” 12:00 Constance Badali – “SpaceBike – Preliminary data on cycling neuromechanics in weightlessness” 12:15 Laurent Opsomer – “Movement direction drift in astronauts performing point-to-point arm movements without visual feedback”			
12:30 – 13:00	<i>Lunch Break</i>			



July 03, 2023 - Monday

	Plenary room (M.01)	Poster hall	Parallel room (M0.4)	Parallel room (M0.5)
13:00 – 14:00		<p>Lunch & Posters</p> <p>Tatiana Kostrominova – <i>“P2Y1 and P2Y2 receptors differ in their role in the regulation of signaling pathways during unloading-induced rat soleus muscle atrophy”</i></p> <p>Bing Han – <i>“Modulation of macrophage pyroptosis by acute or chronic stress - an in vitro approach”</i></p> <p>Sharon van Rijthoven – <i>“Ageing and altered gravity: a cellular perspective”</i></p> <p>Debora Angeloi – <i>“Microgravity and space radiation inhibit autophagy in human capillary endothelial cells”</i></p> <p>Natassi Navasiolava – <i>“Chronic increase in renin-angiotensin-aldosterone activity at steady state of microgravity: why and by which mechanisms?”</i></p> <p>Roman Zhedyaev – <i>“Direct comparison of tilt test and lower body negative pressure effects on human hemodynamics and baroreflex regulation after dry immersion”</i></p> <p>Artur Fedianin – <i>“The effect of various spinal cord stimulation and support afferentation on the condition of the muscles of the rat's lower leg during simulated gravitational unloading”</i></p> <p>Daniela Santucci – <i>“Neurobehavioural evaluation in mice exposed to acute 2G hypergravity in normothermic or synthetic torpor conditions”</i></p> <p>Ann-Sofie Schreurs – <i>“Candidate countermeasure to mitigate adverse effects of spaceflight on musculoskeletal, cardiovascular and central nervous systems tissues”</i></p> <p>Kevin Tabury – <i>“A blood vessel microfluidic chip to study vascular remodeling in space”</i></p> <p>Stijn Meel – <i>“Influence of prolonged exposure to microgravity on perception of verticality”</i></p> <p>Dirk Neefs – <i>““Space dentistry” - An invention or a modern necessity?”</i></p>		

July 03, 2023 - Monday

	Plenary room (M.01)	Poster hall	Parallel room (M0.4)	Parallel room (M0.5)
14:00 – 15:45			<p>Spaceflight analogues and countermeasures</p> <p><u>Moderators</u> Angelique Van Ombergen and Philip Carvil</p> <p><u>Speakers</u> 14:00 Ilya Rukavishnikov – “Comparative Results Of 21-Day Dry Immersion And 21-Day Head Down Tilt Bed Rest”</p> <p>14:15 Bjorn Baselet – “Combined biological effects of ionizing radiation, psychological stress and microgravity in space: the hind limb unloading mouse model”</p> <p>14:30 Vivekanand Vimal – “Vibrotactile Feedback as a Countermeasure to Spatial Disorientation”</p> <p>14:45 Carole-Anne Vollette – “A wearable-based system to reduce space motion sickness by multi-sensory pre-habituation”</p> <p>15:00 Jonathan Scott – “Effects of body size and countermeasure exercise on estimates of life support resources during all-female crewed exploration missions”</p> <p>15:15 Jack van Loon – “Reduce Cost by Permanent Artificial Gravity”</p>	<p>Biology</p> <p><u>Moderators</u> Sharmila Bhattacharya and Sarah Baatout</p> <p><u>Speakers</u> 14:00 Elena Gorbacheva – “Hormonal Status Of Woman And Structural Characteristics Of The Ovaries And Uterus After A 5-Day “Dry” Immersion”</p> <p>14:15 Irina V. Ogneva – “Cell Stiffness And Protein Content In <i>Drasophila Melanogaster</i> Oocytes After Space Flight”</p> <p>14:30 Dagmara Stasiowska – “Impact of honey bee (<i>Apis mellifera</i>) queen exposure to hypergravity on colony development - case study”</p> <p>14:45 Simon Wuest – “Analyzing Calcium Signaling by CaMPARI2 during Parabolic Flights”</p> <p>15:00 Christian Liemersdorf – “Human Neural Network Activity Reacts to Gravity Changes”</p> <p>15:15 Jess Buncek – “VEG-04: How Lighting Affects Crop Production, Quality, And Acceptability of Mizuna Mustard Grown on the International Space Station”</p> <p>15:30 Jennifer-Vernice Pauly – “Veggie on ICE: The Effects of Plant Production on Human Behavioral Health in Long-Duration Antarctic Overwintering Missions”</p>
15:45 – 16:15	Coffee Break			



July 03, 2023 - Monday				
	Plenary room (M.01)	Poster hall	Parallel room (M0.4)	Parallel room (M0.5)
16:15 – 18:00			<p>Cardiovascular and respiratory system</p> <p><u>Moderators</u> Jérémy Rabineau and Ana Diaz-Artiles</p> <p><u>Speakers</u> 16:15 Dag Linnarsson – “Lung diffusing capacity for nitric oxide in space: microgravity gas density interactions” 16:30 Paniz Balali – “Adaptive Changes in Heart Rate Variability and Cardiac Function during Long-Term Spaceflight: Insights from Wearable Devices” 16:45 Jason Fisher – “Cardiovascular And Cutaneous Blood Flow Responses To Artificial Gravity And Temperature: A Pilot Study” 17:00 Damien Lanéellé – “Cerebral Blood flow distribution according to cerebral arterial pattern variations during hemodynamic stress induced by simulated hypovolemia or hypercapnia: a triplex ultrasound and magnetic resonance imaging study” 17:15 Danielle Greaves – “Robotic Ultrasound on ISS Operated from Canadian University’s Mission Control Center - Results from Vascular Echo Experiment” 17:30 Philippe Arbeille – “Spaceflight and Dry Immersion Increases the Reflectivity of the Arterial Wall to Ultrasound Radio Frequency Waves” 17:45 Damian Bailey – “Gravitational transitions increase blood-brain barrier permeability in humans; focus on the redox-regulation of cerebral hyper-fusion”</p>	<p>Bone and musculoskeletal system</p> <p><u>Moderators</u> Anna-Maria Liphardt and Stefan Schneider</p> <p><u>Speakers</u> 16:15 Ivan Ponomarev – “Effect of 5-day dry immersion on viscoelastic and contractile properties of the lower extremities muscles in women” 16:30 Alexandra Ryabova – “Effects of 5-day dry immersion on characteristics of shin muscles motor evoked potentials in women” 16:45 Maren Dreiner – “Sex-specific cartilage biomarker response to 5 days of dry immersion” 17:00 Alessandra Bosutti – “Impact of 60-bed rest and human artificial gravity on serum oxidative stress biomarkers and skeletal muscle protein oxidative modifications” 17:15 Peter Fernandez – “Insights and Conundrums Involving Spaceflight and Bone - An 18-Month Perspective” 17:30 Elie-Tino Godonou – “Effect of microgravity during long-duration spaceflight on transverse relaxation times of the femorotibial cartilage (MRI T2) - the ESA Cartilage Health study”</p>
20:00 – 22:00	Welcome reception at Horta			

July 04, 2023 - Tuesday

	Plenary room (M.01)	Poster hall	Parallel room (M0.4)	Parallel room (M0.5)
9:00 – 11:00	<p>Plenary session “Discussion panel exercise and countermeasures”</p> <p><u>Moderators</u> Anna-Maria Liphardt and Rodrigo Fernandez-Gonzalo</p> <p><u>Discussion panel</u> Meghan Everett – <i>“Enabling the Human to Explore the Moon and Beyond”</i></p> <p>Rodrigo Fernandez-Gonzalo – <i>“Is the “optimal exercise” for future exploratory missions optimal for everyone? The individual variability issue”</i></p> <p>Martina Heer – <i>“Is the pantry on the way to Mars big enough? The tangle relationship between exercise load and energy requirements”</i></p> <p>Stefan Schneider – <i>“Exercise recommendations? A hedonistic brain perspective!”</i></p> <p>Jonathan Scott – <i>“One giant leap for Mankind”</i></p>			
11:00 – 11:30	<i>Coffee Break</i>			
11:30 – 12:30	<p>Young Investigator Award</p> <p><u>Moderators</u> Rodrigo Fernandez-Gonzalo, Steven Jillings, Inês Antunes</p> <p><u>Speakers</u> 11:30 Roxy Fournier – <i>“Increased cerebrovascular tone following long duration spaceflight is associated with increased pulsatility and reduced conductance”</i></p> <p>11:45 Emil Rehnberg – <i>“Compartmentalized chip for improved formation of human cardiac spheroids using simulated microgravity”</i></p> <p>12:00 Timo Frett – <i>“Comparison between maximal rowing ergometry in artificial gravity and terrestrial conditions”</i></p> <p>12:15 Carmen Possnig – <i>“Influence of gravitational gradients on cerebral and ocular blood flow”</i></p>			
12:30 – 13:00	<i>Lunch Break</i>			



July 04, 2023 - Tuesday

	Plenary room (M.01)	Poster hall	Parallel room (M0.4)	Parallel room (M0.5)
13:00 – 14:00		<p>Lunch & Posters</p> <p>Patrick Lau – “<i>FLUMIAS - high-resolution live-cell fluorescence microscopy and identification of gravity-dependent thresholds on-board the ISS</i>”</p> <p>Fuminori Kawano – “<i>Histone chaperone SPT16 triggers histone turnover in mouse skeletal muscle</i>”</p> <p>Junya Shimizu – “<i>Role of exercise-induced H3K27me3 for the gene response to exercise in mouse skeletal muscle</i>”</p> <p>Simon Vandergooten – “<i>Directional accuracy of point-to-point arm movements in different body orientations with respect to gravity</i>”</p> <p>Katharina Biere – “<i>Isolation and lack of stimuli in Antarctica temporarily increase the alertness of the innate immunity</i>”</p> <p>Vivek Mann – “<i>Blood vessels and microgravity</i>”</p> <p>Ryo Masuzawa – “<i>Examination of histone variant induction as a novel countermeasure for long term stay in space using mouse model</i>”</p> <p>Daniela Santucci – “<i>Effect of 30 day-3G-exposure on C57BL6J mice: neurobehavioural and biomolecular effects on ocular and brain tissues</i>”</p> <p>Nelly Abu Sheli – “<i>Practical applications of electrical stimulation space model with "Russian Currents" in neurological elderly patients</i>”</p> <p>Margot Winters – “<i>Optimizing seed quality for space agriculture with GENESPACE: A study on radiation mutation breeding using stratospheric balloons</i>”</p>		
14:00 – 15:30	<p>Space agencies (CNES, DLR, ASI, NASA, CSA, and ESA)</p> <p><u>Moderators</u> Sarah Baatout and Catho Schoenmaekers</p>			

July 04, 2023 - Tuesday

	Plenary room (M.01)	Poster hall	Parallel room (M0.4)	Parallel room (M0.5)
15:30 – 16:00	Coffee Break			
16:00 – 17:45			<p>Spaceflight applications</p> <p><u>Moderators</u> Angelique Van Ombergen and Jonathan Scott</p> <p><u>Speakers</u> 16:00 Inês Antunes – “ESA’s SciSpace team”</p> <p>16:15 Masahiro Terada – “The implementation of the educational programs for space medicine in Japan”</p> <p>16:30 Andrei Saperia – “New commercial applications for space physiology and human spaceflight”</p> <p>16:45 Ryan T. Scott – “Open Science for Life in Space: Data Sharing, Standards, and Informatics for Reuse and Knowledge Discovery”</p> <p>17:00 Anna Catharina Carstens – “Fluorescent live cell imaging on a centrifuge in space: FLUMIAS”</p> <p>17:15 Alamelu Sundaresan – “Development and Characterization of 3D culture of bone tissue as a physiological test bed for pharmaceutical formulations”</p> <p>17:30 Marina Cara Tuschen – “μIMMUNE - Development of automated microfluidic immune monitoring for spaceflight, a first report”</p>	<p>Neuroscience</p> <p><u>Moderators</u> Steven Jillings and Kunihiko Tanaka</p> <p><u>Speakers</u> 16:00 Nikita Shishkin – “Sensory Organization of Postural Control After Long Term Space Flight”</p> <p>16:15 Kunihiko Tanaka – “Magnetic Vestibular Stimulation Amplifies Posture and Arterial Pressure Control”</p> <p>16:30 Maria Bekreneva – “Effect of 5-day Dry Immersion On Vertical Stability And Voluntary Walking in Woman”</p> <p>16:45 Olga Kuldavletova – “Comparison of postflight mission critical tests between astronauts and bilateral vestibular patients”</p> <p>17:00 Laurent Opsomer – “A haptic illusion created by gravity”</p> <p>17:15 Michele Tagliabue – “The Role of Gravity in Eye-Hand Coordination: Effects of Short-Term and Long-Term Head-Gravity Misalignment”</p> <p>17:30 Deborah Cecilia Navarro Morales – “Duration judgement in astronauts and patients with idiopathic bilateral vestibular loss”</p>
18:00 – 18:30	ELGRA General Assembly			
18:30 – 20:00	Careers & Beers			



July 05, 2023 - Wednesday

Plenary room (M.01)

Poster
hallParallel
room
(M0.4)Parallel
room
(M0.5)9:00 –
11:00**Plenary session “Hybernation and hypometabolic state”**Moderators

Alexander Choukér and Jürgen Bereiter-Hahn

SpeakersDominique Moser – *“Is torpor slumbering in all of us? A comparative cross-species analysis”*Matteo Cerri – *“Hypometabolism in hypergravity: metabolic and behavioral effects”*Fabrice Bertile – *“Hibernation as a source of innovation for space biology and biomedicine: a focus on brown bears”*11:00 –
11:30

Coffee Break

11:30 –
12:30**Young Investigator Award**Moderators

Anna-Maria Liphardt, Kimia Seyedmadani, Rodrigo Coutinho De Almeida

Speakers**11:30** Peter Fernandez – *“Preliminary insights into bone adaptation and differences in energy metabolism between males and females under (DI) conditions”***11:45** Florian Pfeiffer – *“Inspired by Space: E-Nose technology provides diagnostic tool for SARS-CoV-2 infection by breath analysis”***12:00** Frederico D’Amico – *“Immune cell activation state in 5-day Dry Immersion: a comparative study between a female and male cohort”***12:15** Angela Kubik – *“Defining CDKN1a/p21-induced changes to the functional and regenerative capabilities of bone-marrow derived stem cells in models of aging, loading, and spaceflight”*12:30 –
13:00

Lunch Break

July 05, 2023 – Wednesday

	Plenary room (M.01)	Poster hall	Parallel room (M0.4)	Parallel room (M0.5)
13:00 – 14:00		<p>Lunch & Posters</p> <p>Katharina Block – <i>“Project NEMUCO - The neuromuscular junction-like structure in vitro to study muscle and nerve cell-cell communication in space”</i></p> <p>Kyung-Ju Shin – <i>“Microgravity induces oxidative stress and mitochondrial dysfunction which is mitigated by TPP-niacin in retinal epithelial cells”</i></p> <p>Darshan Chandramowli – <i>“Targeted proteomic analysis of S. cerevisiae in microgravity conditions in response to antifungal stress”</i></p> <p>Ivan Vasilev – <i>“Study of vascular hemodynamics in healthy men undergoing 21-day antiorthostatic hypokinesia”</i></p> <p>Hendrik Bouwman – <i>“Effects of sustained hypergravity on growth and reproduction in earthworms”</i></p> <p>Laurence Stevens – <i>“Chronic recording of EMG activity by telemetry in mice skeletal hindlimb muscles during long-term inactivity”</i></p> <p>Danielle Greaves – <i>“Cervical intervertebral distance measured using 3D ultrasound after dry immersion and 6 month spaceflight”</i></p> <p>Adriana Salatino – <i>“Motor awareness in microgravity: action self-monitoring during parabolic flights”</i></p> <p>Sarah Schunk – <i>“Astrocyte reactivity can be modulated by altered gravity”</i></p> <p>Alina Saveko – <i>“Human postural responses to artificial gravity training”</i></p> <p>Judith Nottage – <i>“Alterations in gravity influences conscious experiences”</i></p> <p>Pinya Kääriäinen – <i>“The influence of spaceflight experience on structural brain changes”</i></p> <p>Dirk Neefs – <i>“Dental care in space as an interdisciplinary procedure”</i></p>		



July 05, 2023 - Wednesday

	Plenary room (M.01)	Poster hall	Parallel room (M0.4)	Parallel room (M0.5)
14:00 – 15:45			<p>Metabolism and immunology</p> <p><u>Moderators</u> Bjorn Basalet and Alexander Choukér</p> <p><u>Speakers</u> 14:00 Mathieu Horeau – “Simulated microgravity differentially affects the iron metabolism in male and female rats”</p> <p>14:15 Frédéric Derbré – “Iron metabolism regulation in women and men exposed to simulated microgravity: results from the randomized trial AGBRESA”</p> <p>14:30 Martina Heer – “Glucose tolerance onboard the International Space Station: First results from an Oral Glucose Tolerance Test”</p> <p>14:45 Dominique Moser – “Preconditioning with mild hypergravity mitigates simulated microgravity-induced T cell dysfunctions”</p> <p>15:00 Silvana Miranda – “Gravity’s Effect on T-Cell Activation: Unraveling the Mechanisms of Immune System Dysregulation in Space”</p> <p>15:15 Judith-Irina Bucheim – “Role of individual immune profiles for wound healing under chronic stress during long-term space flight”</p>	<p>Neuroscience</p> <p><u>Moderators</u> Angelique Van Ombergen and Katie Warthen</p> <p><u>Speakers</u> 14:00 Ge Tang – “Establishing a link between brain and eye in long-duration spaceflight”</p> <p>14:15 Kimia Seyedmadani – “Superior Baseline Oculomotor Performance Viewing with the Dominant Eye”</p> <p>14:30 Jean Pauly – “Psychological and cognitive adaptation during a 3-weeks confinement in a space-like environment”</p> <p>14:45 Gabriel De La Torre – “Neurocognitive assessment in microgravity: Review under a clinical perspective”</p> <p>15:00 Elisa Raffaella Ferrè – “Cognition in Zero-G: How Altered Gravity Influences Human Brain and Behaviour”</p> <p>15:15 Steven Jillings – “Brain structural and functional changes after long duration spaceflight”</p> <p>15:30 Jennifer-Vernice Pauly – “Brains on ICE - Hippocampal Changes in Response to Prolonged Isolation and Confinement”</p>
15:45 – 16:15	Coffee Break			

July 05, 2023 - Wednesday

	Plenary room (M.01)	Poster hall	Parallel room (M0.4)	Parallel room (M0.5)
16:15 – 18:00			<p>Cardiovascular system</p> <p><u>Moderators</u> Roxy Fournier and Damian Bailey</p> <p><u>Speakers</u> 16:15 Adrien Robin – <i>“Venous filling and emptying properties during 5-day strict dry immersion microgravity simulation”</i></p> <p>16:30 Ana Diaz Artilles – <i>“Quantification Of The Internal Jugular Vein Characteristics During Fluid Shift Induced By Lower Body Negative Pressure”</i></p> <p>16:45 Richard Hughson – <i>“Is fainting after 14-day head-down bed rest in 55-65 year-old men and women a chicken and egg question?”</i></p> <p>17:00 Jérémy Rabineau – <i>“Correlation of changes in aortic stiffness with other parameters of cardiovascular health after 60-day head-down bed rest”</i></p> <p>17:15 Jacques-Olivier Fortrat – <i>“Increased Cardiovascular Self-Organized Critically After Prolonged Head-Down Bed Rest”</i></p> <p>17:30 Stefan Möstl – <i>“Autonomic cardiovascular control following 30 days strict head down tilt bedrest - Results from the SANS CM studies”</i></p>	<p>Bone and musculoskeletal system</p> <p><u>Moderators</u> Rodrigo Fernandez Gonzalo and Laurence Vico</p> <p><u>Speakers</u> 16:15 Britt Schoenrock – <i>“Muscle stiffness in astronauts during long duration missions onboard the International Space Station (MYOTONES)”</i></p> <p>16:30 Elena Fomina – <i>“The weight load simulation mode every other day is quite effective for preserving muscular strength on long space missions”</i></p> <p>16:45 Philip Carvil – <i>“Effects of a proposed microgravity countermeasure, the MK VI SkinSuit, upon markers of lumbar geometry and kinematics following unloading”</i></p> <p>17:00 Margot Issertine – <i>“The NEBULA Project: effect of preflight endurance and resistance training as a countermeasure against microgravity-induced musculoskeletal deconditioning”</i></p> <p>17:15 Thomas Angeli – <i>“Implementation of Blood Flow Restricted Exercising for Strength Increase in Quadriceps Muscle on the Multifunctional Dynamometer for Application in Space”</i></p> <p>17:30 Mona Nasser – <i>“Jaw movement in microgravity”</i></p> <p>17:45 Elie-Tino Godonou – <i>“Changes in urinary concentration of the cartilage degradation marker Coll2-1NO2 in response to bed rest immobilization and countermeasures”</i></p>
19:00 – 1:00	Gala dinner and announcement of Young Investigator Awards (YIA)			



July 06, 2023 - Thursday				
	Plenary room (M.01)	Poster hall	Parallel room (M0.4)	Parallel room (M0.5)
9:45 – 12:00	<p>Plenary session “Neuroscience”</p> <p><u>Moderators</u> Floris Wuyts</p> <p><u>Speakers</u> Floris Wuyts – “How does the brain react to space”</p> <p>Brandon Macias – “Spaceflight Associated Neuro-ocular Syndrome: The Gravity of the Mission”</p> <p>Jay Buckley – “A re-evaluation of the acute adaptation to weightlessness and what it means for SANS”</p> <p>Elena Tomilovskaya – “Effects of Dry Immersion in sensory-motor system”</p>			
12:00 – 12:30	<i>Closing Ceremony</i>			
12:30 – 13:30	<i>Lunch Break</i>			
13:30 – 15:30	ISGP General Assembly			
15:30 – 18:00	Royal Museum of Fine Arts (KMSKA) visit			