19th IAA
Humans in Space
Linking the challenges of space exploration with medicine on Earth

July 7-12, 2013 | Cologne, Germany

PROGRAM
www.his2013.com
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Dear Colleagues,

It is a great pleasure for me to welcome you at the 19th IAA Humans in Space Symposium in Cologne, Germany, from July 7 to 12, 2013. The main theme of the symposium is

"Linking the challenges of space exploration with medicine on Earth."

In recent decades, space life sciences research has resulted in many advances in our knowledge of how the human body and life itself works. This field has matured from approaches like phenomenology, spin off strategies or risk based approaches towards tackling hypothesis-based basic questions. It is now time to end the artificial separation between space and terrestrial life sciences and to focus on those questions of life sciences for which space experiments can give answers. Operational space medicine questions, of which we have only a weak understanding of the underlying basic physiology, will remain as major research questions in the future.

The German Aerospace Center DLR just opened a major new research facility named :envihab. This facility stands for a new approach in space research: namely to look from problems or questions in space towards the underlying basic question first and then design a hypothesis and an approach to answer the basic question and, later, how and where to apply the answers. If this is done, a separation between "space thinking" and "earth thinking," as is still common in space research, will suddenly be counterproductive and the question as to where solutions would be applied first (in space or on earth), will also be secondary. In other words, in the future, the main goal will be to make use of the high potential that space research may have for answering basic scientific questions.
As the International Space Station (ISS) will hopefully be available for research beyond 2020 and as it is not sure, at this time, which opportunities for space life sciences research will be available beyond 2020, we should now try to optimally use the ISS opportunity to focus on hypothesis-driven research.

Therefore, the organizers of the 19th IAA Humans in Space Conference prepared a program that focuses on basic major questions and challenges which attracts will try to attract respective specialists, regardless of whether they are from the space research community or not. We are very happy that the conference is highly attended at the conference, stimulating interdisciplinary discussions on how to focus on major life sciences questions that can be answered with the help of space research. This also involves the topic of future joint funding approaches.

We are looking forward to meet all the friends at the Symposium, make new friends and to strengthen the international community of pioneers, who use the environment of microgravity for the benefit of humankind as well as for helping to expand the action radius of the human race.

Sincerely,

Prof. Dr. med. Rupert Gerzer
Symposium President
Head, Institute of Aerospace Medicine
German Aerospace Center
Maternushaus
Kardinal-Frings-Str. 1-3
50668 Cologne
Germany
www.maternushaus.de
General Information

Conference Organizers
German Aerospace Center
Planitzweg 51147 Cologne, Germany

Symposium President
Prof. Dr. med. Rupert Gerzer phone: +49 2203 601 3115

Symposium Vice President
Prof. Dr. med. Joern Rittweger phone +49 2203 601 3080

Head of Organizing Committee
Prof. Dr. Bernhard Koch phone: +49 2203 601 3113

Members of Organizing Committee
Sabine Jackman phone: +49 2203 601 3309
e-mail: sabine.jackman@dlr.de
Friederike Wütscher phone: +49 2203 601 3328
e-mail: friederike.wuetscher@dlr.de

Conference Secretary:
INTERCOM Dresden GmbH
Zellescher Weg 3
01069 Dresden, Germany
Sylvia Neumann phone: +49 351 320 17 320
fax: +49 (0)351 320 17 333
e-mail: mail@his2013.com

Conference Homepage: www.his2013.com
Cloakroom and Storage
A cloakroom is available in the registration area at the Maternushaus Cologne.

Coffee Breaks / Lunch and refreshments
Coffee breaks and lunches will be served in the foyer. The breaks are indicated in the program. The coffee breaks as well as the lunch are included in the conference fee.

Disclaimer
The organizers are not liable for damages and/or losses of any kind which may be incurred by the symposium delegates or by any other individuals accompanying them, both during the official activities as well as going to/from the symposium. Delegates are responsible for their own safety and belongings.

Local Public Transport
Cologne has an excellent public transportation network of busses and trams. The conference venue can be reached by bus from all conference hotels. Detailed information will be provided to participants at the registration desk.

Lost & Found
Lost & Found items are handled by the registration desk.
Medical Care
In the case of sickness or injury, we request that you notify the registration desk immediately.

Name Badges
Participants and accompanying persons are required to wear the official symposium name badges on all symposium occasions.

Official Language
The conference language is English. There will be no simultaneous interpretation.

Parking
An underground car park is available at the Maternushaus (conference venue):
Opening hours: 24 hours daily
Entrance: “Auf dem Hunnenrücken”

Registration Desk / Hospitality Desk
July 7, 2013  04.00 pm – 06.00 pm
July 8, 2013  07.30 am – 06.00 pm
July 9, 2013  08.00 am – 07.00 pm
July 10, 2013 08.00 am – 07.00 pm
July 11, 2013 08.00 am – 05.00 pm
July 12, 2013 08.00 am – 01.00 pm
Registration Fee on Site

Members of IAA  500,00 €
Non-members   650,00 €
Students*     150,00 €
Accompanying Person  150,00 €
Daily Registration  180,00 €
Gala Dinner     80,00 €

* To register as a student please provide us with a copy of your student ID or certificate at the registration desk.

Time Differences

Cologne, Germany is in Central European Time.
Scientific Coordination

Symposium President
Rupert Gerzer, DLR Köln
Jörn Rittweger, DLR Köln

Symposium Vice President

Members of Local Scientific Coordination

D. Aeschbach, DLR Cologne
V. Damann, ESA EAC Cologne
C. Hellweg, DLR Cologne
B. Johannes, DLR Cologne
G. Kluge, DLR Cologne
E. Rabbow, DLR Cologne
J. Rittweger, DLR Cologne
R. Anken, DLR Cologne
P. Gräf, DLR Bonn
R. Hemmersbach, DLR Cologne
B. Koch, DLR Cologne
C. Pruett, ESA EAC Wyle Cologne
G. Reitz, DLR Cologne
G. Ruyters, DLR Bonn

Scientific committee

Symposium President
Rupert Gerzer, DLR Köln

Additional Members

D. Aeschbach, Germany
R. Anken, Germany
M. Antunano, USA
M. Basner, USA
A. Buckley, France
N. Buckley, Canada
A. Choukèr, Germany
G. Clement, France
K. Dai, China
V. Damann, Germany
Y. Deng, China
P. Ehrenfreund, USA
H.-C. Gunga, Germany
C. Hellweg, Germany
R. Hemmersbach, Germany
S. Iwase, Japan
B. Johannes, Germany
N. Kanas, USA
V. Katuntsev, Russia
J. Li, China
C. Otto, USA
O. Orlov, Russia
G. Reitz, Germany
P. Rettberg, Germany
T. Russomano, Brazil
O. Ullrich, Switzerland
Honorary Chairpersons
J.-M. Contant, France
A. Grigoriev, Russia
K.E. Klein, Germany
R. White, USA

Honorary Vice Chairpersons
S. Chen, China
J. Davis, USA
G. Horneck, Germany
I. Kozlovskaya, Russia
C. Mukai, Japan
I. B. Ushakov, Russia
M. Zell, Netherlands

Chairpersons
Conference President: R. Gerzer, DLR Cologne
Deputy Conference President: J. Rittweger, DLR Cologne
Head Organizing Committee: B. Koch, DLR Cologne

Vice-Chairpersons
J. Charles, USA
J-F. Clervoy, France
P. Gräf, Germany
C. Kourtidou-Papadeli, Greece
W. Paloski, USA
D. D. Prunariu, Romania
G. Ruyters, Germany
P. Shang, China
J. Sutton, USA
F. Zhuang, China
Oral Presentation

Oral presentations will have a total length of 15 min, each, which should roughly be divided into 10 min of presentation and 5 min of discussion.

Oral presentations should be provided as powerpoint (.ppt, .pptx) or as .pdf file. In each room a computer projector (Windows-based) with beamer are available. All speakers are requested to turn in their presentation at least 2 hours before their presentation in the media check desk in the foyer where it can also be checked if they display correctly. In exceptional cases you can use your own notebook. In this case you should meet with the room attendant and check that all the material you need for the presentation is available.

Poster Presentation

The poster boards are specified with a height of 1.50 meters (59 inches) and a width of 1.20 meters (47 inches). We recommend A-0 portrait format for the poster. Landscape format does not fit on the poster boards. Material to mount posters will be made available. Posters can only be fixed on poster boards, using the fixing material provided at the poster desk.
Where the cathedral spires tower over Germany's oldest city and its innumerable cultural and historical treasures, world-famous museums and active art scene. The world feels at home in Cologne, where people meet for a Kölsch, a chat or simply a laugh. Life in Cologne is uncomplicated and vivacious.

Concerning population, Cologne is the largest city in North Rhine-Westphalia and the fourth largest city in Germany. As to area, Cologne is only slightly smaller than Berlin or Hamburg. It is made up of nine urban districts and a total of 85 quarters, known as "Veedel" in Cologne dialect.

With its seven Rhine bridges and ten motorways, Cologne has an excellent transport system. Each day more than 1000 trains enter or leave Cologne Hauptbahnhof (main station). Over the last few years, the international Cologne-Bonn Airport has become the German hub for budget airlines and air freight, whereas the harbour has made it the second largest inland port location in Germany.

Cologne was built on ground that is steeped in history. Numerous cultural monuments from the past 2000 years, such as the famous Roman Dionysus mosaic, the medieval Overstolzenhaus and the Gürzenich Hall, as well as modern structures such as the opera house (1957) and the Media Park (from 1989 onwards) are found in this city.

Resource: http://www.koeln.de/cologne_tourist_information
<table>
<thead>
<tr>
<th>Accommodation</th>
<th>Distances</th>
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<tbody>
<tr>
<td><strong>Maternushaus</strong></td>
<td>City centre: 0.6 km</td>
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<tr>
<td>Kardinal-Frings-Str. 1-3</td>
<td>Central station: 0.7 km</td>
</tr>
<tr>
<td>50668 Cologne</td>
<td>Airport: 15.0 km</td>
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<tr>
<td>Germany</td>
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<tr>
<td><a href="http://www.maternushaus.de">www.maternushaus.de</a> (German)</td>
<td></td>
</tr>
<tr>
<td><strong>Hotel Ibis Cologne Zentrum</strong></td>
<td>Congress venue: 2.0 km</td>
</tr>
<tr>
<td>Neue Weyerstr. 4</td>
<td>City centre: 2.0 km</td>
</tr>
<tr>
<td>50676 Cologne</td>
<td>Central station: 2.0 km</td>
</tr>
<tr>
<td>Germany</td>
<td>Airport: 15.0 km</td>
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<tr>
<td><a href="http://www.ibis.com">www.ibis.com</a></td>
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<tr>
<td><strong>Lindner Hotel Dom Residence Cologne</strong></td>
<td>Congress venue: 0.5 km</td>
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<tr>
<td>An den Dominikanern 4a</td>
<td>City centre: 0.5 km</td>
</tr>
<tr>
<td>50668 Cologne</td>
<td>Central station: 0.5 km</td>
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<tr>
<td>Germany</td>
<td>Airport: 16.0 km</td>
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<tr>
<td><a href="http://www.lindner.de">www.lindner.de</a></td>
<td></td>
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<tr>
<td><strong>Excelsior Hotel Ernst</strong></td>
<td>Congress venue: 0.6 km</td>
</tr>
<tr>
<td>Domplatz / Trankgasse 1-5</td>
<td>City centre: 0.1 km</td>
</tr>
<tr>
<td>50667 Cologne</td>
<td>Central station: 0.1 km</td>
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<tr>
<td>Germany</td>
<td>Airport: 15.0 km</td>
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<tr>
<td><a href="http://www.excelsiorhotelernst.com">www.excelsiorhotelernst.com</a></td>
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<tr>
<td><strong>Hotel Pullman Cologne</strong></td>
<td>Congress venue: 1.0 km</td>
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<td>Helenenstr. 14</td>
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<tr>
<td>50667 Cologne</td>
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<tr>
<td>Germany</td>
<td>Airport: 16.0 km</td>
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<tr>
<td><a href="http://www.pullmanhotels.com">www.pullmanhotels.com</a></td>
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</table>
Welcome Reception and Guided Tour to :envihab on July 7, 2013

Because of the high demand the organizers of Humans in Space 2013 are pleased to introduce to you the new :envihab facility with a specific scientific Opening Ceremony. Therefore we invite all participants, exhibitors and partners to enjoy this specific Scientific Opening Ceremony and the Welcome Reception including a guided tour on the evening of July 7, 2013. Guests will spend an evening in :envihab with their friends and fellows in a relaxing atmosphere with live music.

Time: 18:30 – 21:30
Location: :envihab
Bus Transfer: 18:00 – 18:30,
Meeting Point: Maternushaus (conference venue)
incl. in registration fee

Lord Mayor’s Reception on July 8, 2013

Time: 18:30 – 20:00
Location: City Hall of Cologne
Gala Dinner on July 11, 2013

We are very proud to invite you to the “Schloss Drachenburg” Königswinter.

The Drachenburg shows the appeal between castle, park and history in harmony with the nature. The unique castle provides a fantastic panorama with a view over the Rhine Valley.

The oldest rack railway of Germany will pick up all participants at the Valley Station to reach the “Schloss Drachenburg”.

Enjoy the evening in a relaxing atmosphere.

Time: from 18:30
Location: Schloss Drachenburg
Price: 80,00 €
Bus Transfer: 17:30 – 18:30
Meeting Point: Maternushaus (conference venue)
### Sunday, July 07, 2013

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>16:00 - 18:00</td>
<td>Registration</td>
<td>Foyer</td>
</tr>
<tr>
<td>18:00 - 18:30</td>
<td>Bus Transfer to :envihab</td>
<td>:envihab</td>
</tr>
<tr>
<td>18:30 - 21:30</td>
<td>Welcome Reception and Guided Tour</td>
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### Monday, July 08, 2013

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>10:00 - 10:30</td>
<td>Press Conference</td>
<td>Adelheid</td>
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<tr>
<td>10:30 - 12:30</td>
<td>Opening Ceremony &amp; Performance</td>
<td>Maternussaal</td>
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<tr>
<td>12:30 - 13:30</td>
<td>Lunch</td>
<td>Maternussaal</td>
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<tr>
<td>13:30 - 15:00</td>
<td>IA - Women in Space</td>
<td>Maternussaal</td>
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<tr>
<td>13:30 - 15:00</td>
<td>IB - Sensorimotor Function &amp; Human Performance</td>
<td>Dreikönigssaal</td>
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<tr>
<td>15:00 - 15:30</td>
<td>Coffee Break</td>
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<tr>
<td>15:00 - 17:00</td>
<td>Meet the Artist</td>
<td>Lambertus</td>
</tr>
<tr>
<td>15:30 - 17:30</td>
<td>Plenary Session 1 - Human Spaceflight: Past, Presence and Future Perspectives</td>
<td>Maternussaal</td>
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<tr>
<td>18:30 - 20:00</td>
<td>Reception Mayor of Cologne, City Hall</td>
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### Tuesday, July 09, 2013

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30 - 10:00</td>
<td>Plenary Session 2 - Topical Developments</td>
<td>Maternussaal</td>
</tr>
<tr>
<td>10:00 - 10:30</td>
<td>Coffee Break</td>
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<tr>
<td>10:30 - 12:00</td>
<td>IIA - Exercise, Countermeasures, Nutrition</td>
<td>Maternussaal</td>
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<tr>
<td>10:30 - 12:00</td>
<td>IIB - Radiation - Part 1</td>
<td>Dreikönigssaal</td>
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<tr>
<td>12:00 - 13:00</td>
<td>Lunch</td>
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<tr>
<td>13:00 - 15:00</td>
<td>POSTERSESSION I</td>
<td>Foyer</td>
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<tr>
<td></td>
<td>I.A - Sensorimotor &amp; Neurovestibular Systems</td>
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<tr>
<td></td>
<td>I.B - Exercise &amp; Countermeasures</td>
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<td></td>
<td>I.C - Radiation Biology</td>
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<tr>
<td></td>
<td>I.D - Cardiovascular System</td>
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</tbody>
</table>
I.E - Artificial Gravity
I.F - Technology for Human Spaceflight

15:00 - 16:30 IIIA - Cardiovascular System
15:00 - 16:30 IIIB - Radiation - Part 2
15:00 - 16:30 IIIC - Antarctica
16:30 - 17:00 Coffee Break
17:00 - 18:30 Plenary Session 3 - Salt Balance:
New Perspectives for Physiology,
Pathophysiology and Clinical

Wednesday, July 10, 2013

08:30 - 10:00 IVA - Bone and Muscle
08:30 - 10:00 IVB - Bioregeneration
10:00 - 10:30 Coffee Break
10:30 - 12:00 VA - Student Session
10:30 - 12:00 VB - Commercial Human Spaceflight:
Preparing for a New Era
12:00 - 13:00 Lunch
13:00 - 15:00 POSTERSESSION II
II.A - Musculoskeletal System
II.B - Technology & Human Performance
II.C - Analog Environments
II.D - Cellular & Molecular Research
II.E - Astrobiology
II.F - Education & Outreach

15:00 - 16:30 VIA - Immunology
15:00 - 16:30 VIB - Artificial Gravity
15:00 - 16:30 VIC - Technology for Human Spaceflight
and Future Problems
16:30 - 17:00 Coffee Break
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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<tbody>
<tr>
<td>17:00 - 18:30</td>
<td><strong>Plenary Session 4</strong> - Personalized Medicine: Astronauts as Role Models</td>
<td>Maternussaal</td>
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<tr>
<td>19:00 - 22:00</td>
<td><strong>Poster Party and Poster Prizes</strong></td>
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**Thursday, July 11, 2013**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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<tbody>
<tr>
<td>08:30 - 10:00</td>
<td><strong>VIIA</strong> - Sleep and Performance</td>
<td>Maternussaal</td>
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<tr>
<td>08:30 - 10:00</td>
<td><strong>VIIB</strong> - Mars500 - Part 1</td>
<td>Dreikönigssaal</td>
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<tr>
<td>10:00 - 10:30</td>
<td>Coffee Break</td>
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<tr>
<td>10:30 - 12:00</td>
<td><strong>VIIIA</strong> - Analog Environments</td>
<td>Maternussaal</td>
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<tr>
<td>10:30 - 12:00</td>
<td><strong>VIIIB</strong> - Cellular and Molecular Research</td>
<td>Dreikönigssaal</td>
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<tr>
<td>12:00 - 13:00</td>
<td>Lunch</td>
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<tr>
<td>13:00 - 14:30</td>
<td><strong>IXA</strong> - Mars500 - Part 2</td>
<td>Maternussaal</td>
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<tr>
<td>13:00 - 14:30</td>
<td><strong>IXB</strong> - Panel on VIIP Risk</td>
<td>Dreikönigssaal</td>
</tr>
<tr>
<td>13:00 - 14:30</td>
<td><strong>IXC</strong> - How to Implement Human Research Experiments on the International Space Station</td>
<td>Adelheid</td>
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<tr>
<td>15:00 - 16:30</td>
<td><strong>Plenary Session 5</strong> - NHHPC and :envihab – Reach out to Future Markets</td>
<td>Maternussaal</td>
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<tr>
<td>16:30 - 17:00</td>
<td>Coffee Break</td>
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<td>17:30 - 18:30</td>
<td><strong>Bus Transfer to Drachenburg</strong></td>
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<tr>
<td>18:30 - 22:00</td>
<td><strong>Gala Dinner</strong></td>
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**Friday, July 12, 2013**

<table>
<thead>
<tr>
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<th>Session</th>
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<tbody>
<tr>
<td>08:30 - 10:00</td>
<td><strong>XA</strong> - Technology &amp; Human Behavior</td>
<td>Maternussaal</td>
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<tr>
<td>08:30 - 10:00</td>
<td><strong>XB</strong> - Astrobiology</td>
<td>Dreikönigssaal</td>
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<td>10:00 - 10:30</td>
<td>Coffee Break</td>
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<td>10:30 - 12:00</td>
<td><strong>Plenary Session 6</strong> - Position Paper on Space Life Sciences - Part 2</td>
<td>Maternussaal</td>
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<tr>
<td>12:00 - 13:00</td>
<td><strong>End of Symposium</strong></td>
<td>Maternussaal</td>
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<tr>
<td>Time</td>
<td>Sunday</td>
<td>Monday</td>
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<tr>
<td></td>
<td>July 7</td>
<td>July 8</td>
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<tr>
<td>08:00 - 08:30</td>
<td>Registration</td>
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<td>08:30 - 09:00</td>
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<tr>
<td>10:00 - 10:30</td>
<td>Press conference</td>
<td>Coffee Break</td>
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<tr>
<td>11:00 - 11:30</td>
<td>Opening Ceremony &amp; Performance</td>
<td>Session IIB Radiation – Part 1</td>
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<td>11:30 - 12:00</td>
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<td>12:00 - 12:30</td>
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<td>13:30 - 14:00</td>
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<tr>
<td>14:00 - 14:30</td>
<td>Session I A Women in Space</td>
<td>Poster Session I</td>
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<tr>
<td>14:30 - 15:00</td>
<td>Session I B Sensorimotor Function &amp; Human Performance</td>
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<tr>
<td>Time</td>
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</table>
13:30  **IA - WOMEN IN SPACE**
13:30  **Ia-1 | Women in Space “Does Sex Matter?”**
Chiaki Mukai
14:15  **Ia-2 | Women in Space: Societal Impact of Unique Role Models**
Andrea Boese
14:30  **Ia-3 | Title to be determined**
Anousheh Ansari
14:45  **Ia-4 | Title to be determined**
Bonnie Dunbar

13:30  **IB - SENSORIMOTOR FUNCTION & HUMAN PERFORMANCE**
13:30  **Ib-1 | Evaluation of the otolith ocular reflex and gaze holding system before and after 6 months of spaceflight: Preliminary Data of the SPIN and GAZE-SPIN experiments**
Floris Wuyts, Ludmila Kornilova, Emma Hallgren, Ivan Naumov, Dmitrii Glukhikh, Kristof Buytaert, Hamish MacDougall, Steven Moore, Pierre-François Migeotte, Nathalie Pattyn, Quentin Delière, Aurelie Weerts, Gilles Clément, Andre Diedrich
13:45  **Ib-2 | Microgravity effects on characteristics of the preprogrammed movements**
Elena Tomilovskaya, Inessa Kozlovskaya
14:00  **Ib-3 | Perception of Ambiguous Reversible Figures on Earth and in Weightlessness**
Adrianos Golemis, Heather Allaway, Michael Demel, Alexandra Kindrat, Alexander Melinyshyn, Tahir Merali, Robert Thirsk, Gilles Clément
14:15  **Ib-4 | Brains @ Work: Better performance in Microgravity?!**
Stefan Schneider
14:30  Ib-5 | The effect of gravity on the perceptual upright: centrifuge experiments  
Laurence Harris, Michael Jenkin, Thomas Hofhammer, Alexandra Noppe, Rainer Herpers

14:45  Ib-6 | Effect of hyper-gravity on human perception of vehicle roll tilt  
Torin Clark, Michael Newman, Laurence Young

15:30  PLENARY SESSION 1 - HUMAN SPACEFLIGHT: PAST, PRESENCE AND FUTURE PERSPECTIVES

15:30  Plenary Session 1-1 | Passive means of countermeasures for long term space flights at present time and in the future  
Inessa Kozlovskaya, Evgenia Yarmanova

15:50  Plenary Session 1-2 | The Spacefaring Millenium  
Reinhold Ewald

16:10  Plenary Session 1-3 | Progress of manned spaceflights in China  
Shanguang Chen, Yinghui Li

16:25  Plenary Session 1-4 | Perspectives for Human Spaceflight in Europe  
Thomas Reiter

16:45  Plenary Session 1-5 | The “Programmatics” of the ISS Crewmembers' Twelve Month Mission  
Pete Hasbrook, Joel Montalbano, John Charles
08:30  PLENARY SESSION 2 - TOPICAL DEVELOPMENTS

08:30  Plenary Session 2-1 | Position Paper on Space Life Sciences
Rupert Gerzer

09:00  Plenary Session 2-2 | The Medical System of the International Space Station Program

09:15  Plenary Session 2-3 | Tomatosphere - A Space Science Outreach Project
R. Morrow, T. Rondeau Vuk, M. Dixon

09:30  Plenary Session 2-4 | CONTENT-ANALYSIS OF INTERPERSONAL PERCEPTION IN A GROUP OF EXPERIENCED COSMONAUTS
Vadim Gushin, Alla Vinokhodova, Peter Suedfeld, Phyllis J. Johnson

09:45  Plenary Session 2-5 | Scientific Clinical Center of JSC “Russian Railways”
Oleg Jurjewitsch Atkov, Yury Gurfinkel

10:30  IIA - EXERCISE, COUNTERMEASURES, NUTRITION

10:30  Ila-1 | POSTURAL RESPONSES ASSOCIATED WITH SPACE FLIGHT AND GROUND BASED ANALOGS
Millard Reschke, Lori Ploutz-Snyder, Igor Koifman, Jody Cerisano, Elizabeth Fisher, Jacob Bloomberg, Elena Tomilovskaya, Ilya Rukavishnikov, Inessa Kozlovskaya

10:45  Ila-2 | Influence of ARED and T2 on Fitness Assessments Following Long Duration Spaceflights on the International Space Station
Lori Ploutz-Snyder, Alan Moore, Jean Sibonga
11:00  Ila-3 | Progress of countermeasures against physiological effects of weightlessness and space medicine experiments in Shenzhou-9 spaceflight mission
Yinghui Li, Yanqiang Bai, Lin-Jie Wang, Yumin Wan, Lina Qu, Yingjun Tan, Zhili Li, Chunyan Wang, Zhongquan Dai, Honghui Wang, Ke Lv, Li He, Yibing Deng, Shanguang Chen

11:00  Ila-4 | Memory impairment, oxidative stress induced by simulated microgravity: ameliorative potential of ginsenosides
Lina Qu, Hailong Chen, Guohua Ji, Ke Lv, Lu Wang, Tingmei Wang, Lei Bi, Ping Zhong, Li He, Yinghui Li

11:15  Ila-5 | POSTURAL CONTROL IN MARTIAN, LUNAR AND ARTIFICIAL GRAVITY SENSORIMOTOR TRAINING AS A COUNTERMEASURE FOR LONG-TERM SPACE FLIGHTS
Ramona Ritzmann, Kathrin Freyler, Albert Gollhofer

11:30  Ila-6 | Phasic-to-tonic shift in muscle activity and increased recruitment of trunk extensors over flexors during low-impact weight bearing exercise
Dorothee Debuse, Karl Gibbon, Angela Hibbs, Nick Caplan, Simon Evetts

11:45  Ila-7 | Cardiovascular and postural control following short-arm centrifugation
Andrew Blaber, Michelle Bruner, Andrea Westbrook, Nandu Goswami

10:30  IIB - RADIATION - PART 1

10:30  IIB-1 | Radiation survey in the ISS-USLab and shielding investigation on Polyethylene and Kevlar in ISS-Columbus with the ALTEA detector
Livio Narici, Luca di Fino, Marianna Larosa, Veronica Zaconte, Marco Casolino, Piergiorgio Picozza
10:45 Ilb-2 | The DOSIS and DOSIS 3D experiments: Long term dose monitoring on board the European Columbus module of the International Space Station (ISS)
Thomas Berger, Soenke Burmeister, Johannes Labrenz, Pawel Bilski, Michael Hajek, Joe Palfalvi, Iva Ambrozova, Filip Vanhavere, Gaza Ramona, Eduardo Yukihiara, Eric Benton, Yukio Uchihori, Satoshi Kodaira, Hisashi Kitamura, Vyacheslav Shurshakov, Aiko Nagamatsu, Matthias Boehme, Guenther Reitz

11:00 Ilb-3 | Active Pixel Detectors for Space Radiation Dosimetry and Area Monitoring Using the CERN-Based Medipix Technology.
Lawrence Pinsky, John Idarraga-Munoz, Martin Kroupa, Son-Minh Hoang, Nicholas Stoffle, Edward Semones, Amir Bahadori, Hisashi Kitamura, Yukio Uchihori, Stanislav Pospisil, Jan Jakubek, Zdenek Vykydal, Daniel Turecek

11:15 Ilb-4 | Radiation Protection for European Astronauts and Extended Spaceflights
Ulrich Straube, Thomas Berger, Guenther Reitz

11:30 Ilb-5 | Ionizing radiation exposure alters coronary vascular function
Maggie Kuo, Theodore Abraham, Artin Shoukas, Dan Berkowitz

11:45 Ilb-6 | Earth flash - a science & art project creating a terrestrial retinal phosphene experience for astronaut training and a general public
Tim Otto Roth

13:00 POSTERSESSION I (I.A – I.F)

13:00 I.A - SENSORIMOTOR & NEUROVESTIBULAR SYSTEMS

13:00 I.a-2 | IMPROVED POSTURAL CONTROL IN RESPONSE TO A 4-WEEK BALANCE TRAINING IN SIMULATED MARTIAN GRAVITY - A COUNTERMEASURE FOR LONG-TERM SPACE FLIGHTS
Kathrin Freyler, Ramona Ritzmann, Albert Gollhofer
13:00  I.a-3 | Fine motor control and cognitive performance under water in comparable depths and body postures of astronaut training
Marc Dalecki, Otmar Bock, Uwe Hoffmann

13:00  I.a-4 | Influence of microgravity on egocentric and allocentric mental rotation
Sebastian Dern, Fabian Steinberg, Marc Dalecki

13:00  I.a-5 | Dependence of Characteristics of the Vestibular-visual Interaction from Repeated Spaceflights
Ludmila Kornilova, Ivan Naumov, Ekaterina Habarova, Dmitrii Glukhikh, Alexander Vasin

13:00  I.a-6 | Neuroplasticity in astronauts and patients with vestibular lesions studied with novel MRI methods preliminary results
Angelique van Ombergen, Ben Jeurissen, Athena Demertzi, Valentin Sinitsyn, Elena Mirshina, Ekatarina Pechenkova, Stefan Sunaert, Steven Laureys, Inessa Kozlovskaya, Elena Tomilovskaya, Jan Sijbers, Paul Parizel, Dirk Loeckx, Paul van de Heyning, Boris V. Morukov, Alexander Choukèr, Jurgen Lutz, Gustav Schelling, Floris Wuyts

13:00  I.a-7 | Visual-manual Tracking and Vestibular Function in Support-Proprioceptive Deprivation
Ludmila Kornilova, Dmitrii Glukhikh, Ivan Naumov, Ekaterina Habarova, Alexander Vasin

13:00  I.a-8 | Influence of electromyostimulation on excitatory and inhibitory processes in motoneuron pool under conditions of dry immersion
Albina Zakirova, Tatiana Shigueva, Elena Tomilovskaya

13:00  I.a-9 | Motor skills in parabolic flights: Influence of the behavioral context, motivation and stress
Fabian Steinberg, Otmar Bock

13:00  I.a-10 | The mechanisms of spinal and cortical motor control after long term space flights
Tatiana Shigueva, Albina Zakirova, Elena Tomilovskaya, Inessa Kozlovskaya
13:00  I.a-12 | Assessment of intracranial pressure changes with otoacoustic emission under conditions of simulated microgravity
Paul Avan, Ilya Rukavishnikov, Beatriz Madero, Elena Tomilovskaya, Hervé Normand, Inessa Kozlovskaya, Pierre Denise

13:00  I.a-13 | Pre-flight Scopolamine Administration Induced Human Cortex Activity Alterations and its Tomographic Origin
Pedro Miguel Ramos Reis, Holger Eckhardt, Pierre Denise, Friedrich Bodem, Matthias Lochmann

13:00  I.a-15 | Event related potentials and the Attention Network Test in Antarctica - a longitudinal study
Endre Takács, Irén Barkaszi, István Czigler, László Balázs

13:00  I.a-16 | Brain electrical activity and performance in a distraction task during Antarctic overwintering
Irén Barkaszi, Endre Takács, István Czigler, László Balázs

13:00  I.a-17 | Rapid antidepressant effects of N-methyl-D-aspartic acid receptor antagonists suggest suitability for subjects exposed to long-term extraterrestrial environment or microgravity conditions.
Michael Knops, Goetz Kluge

13:00  I.B - EXERCISE & COUNTERMEASURES

13:00  I.b-1 | EFFECTS OF EXERCISE-HEAT ACCLIMATION ON CARDIOVASCULAR REGULATION DURING ORTHOSTATIC CHALLENGE IN THE HEAT
Osman Ates, Vahur Ööpik, Kersti Jagomägi, Jaak Talts, Rein Raamat, Birol Cotuk

13:00  I.b-2 | VALIDATION OF A NON-INVASIVE APPROACH TO ASSESS MUSCULAR OXYGEN UPTAKE KINETICS
Uwe Drescher, Alan P. Benson, Harry B. Rossiter, Uwe Hoffmann
13:00  I.b-3 | The different effects of high intensity interval training and moderate intensity interval training for weightlessness countermeasures
Lin-Jie Wang, Zhili Li, Hui-Juan Wang, Wenjuan Chen, Jian-Feng Zhang, De-Sheng Wang, Dong-Bin Niu, Yan Qing Wang, Qi Zhao, Yi Cao, Cheng-Jia Yang

13:00  I.b-4 | Early changes in respiratory quotient following reduced activity in lean subjects
Helena Kenny, Donal O'Gorman

13:00  I.b-5 | Feasibility of self-paced exercise regimen as a countermeasure for long-duration missions: self-monitored exercise logs of an isolated crew in Antarctica
Maria Francesca Piacentini, Nathalie Pattyn, Bart Roelands, Helio Fernandez-Tellez, Eoin McDonald-Nethercott, Romain Meeusen

13:00  I.b-6 | Physical Exercise - A Countermeasure Against Disruptions of the Circadian Timing System During Spaceflight?
Alexander Stahn, Stefan Mendt, Oliver Opatz, Mathias Steinach, Martina Anna Maggioni, Daniel Belavy, Dieter Felsenberg, Hanns-Christian Gunga

13:00  I.b-8 | The Gravity Loading Countermeasure Skinsuit: Initial Investigations and Future Concepts
Dustin Kendrick, Gail Perusek, Dava Newman

13:00  I.b-9 | SENSO-Gym: A new technology for resistive exercise
Matthias Boehme, Matthias Hähnle, Norbert Sporer, Peter Schneider, Detlev Hüser
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<td>13:00</td>
<td>I.C - RADIATION BIOLOGY</td>
<td>I.c-2</td>
<td>RAD and CRaTER Measurements of Ionizing Radiation in Deep Space</td>
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<td>13:00</td>
<td>I.C - RADIATION BIOLOGY</td>
<td>I.c-3</td>
<td>A study on the lateral distribution of Cherenkov light in simulated extensive air showers of cosmic rays</td>
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<td>I.C - RADIATION BIOLOGY</td>
<td>I.c-5</td>
<td>Biological effects of secondary radiation induced by the interaction of HZE particles and shielding material</td>
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<td>13:00</td>
<td>I.C - RADIATION BIOLOGY</td>
<td>I.c-6</td>
<td>Effects of low-LET ionizing radiation on growth and development of higher plants: the case of tomato</td>
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<td>13:00</td>
<td>I.C - RADIATION BIOLOGY</td>
<td>I.c-7</td>
<td>Dynamic regulation network of alternative splicing after irradiation in gliomas</td>
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13:00  I.c-8 | Neurobehavioral and neurochemical changes following head-only radiation exposure in the inbred Fischer 344 and Lewis rats.  Catherine Davis, Peter Guida, Robert Hienz

13:00  I.c-9 | Radioprotective effects of dragon' blood and dragon's blood extracts on Irradiation-Induced Myelosuppressive Mice  Yuanyuan Ran, Hong Qing, Hong Ma, Qiutian Jia, Bo Tang, Yu Xia, Shuangquan Shan, Yulin Deng

13:00  I.c-10 | Effects of Space Environment on cells of the outer sheath of mouse skin hair: A comparison with the effects of x-irradiation  Hideyuki Majima, Ken-Ichiro Matsumoto, Hiroko Indo, Yoshihiro Kawabata, Tomoko Kushig, Takuro Kanekura, Akihide Tanimoto, Masahiro Terada, Akira Higashibata, Noriaki Ishioka, Aiko Nagamatsu, Hiromi Suzuki, Daisuke Masuda, Yoshinobu Ohira, Betty Nusgens, Shin Yamada, Hiroshi Ohshima, Chiaki Mukai

13:00  I.c-11 | ER-bodies formation in Arabidopsis thaliana root apices under clinorotation and after X-ray irradiation  Svitlana Romanchuk

13:00  I.D - CARDIOVASCULAR SYSTEM

13:00  I.d-1 | ASSESSMENT OF HEART RATE, PULMONARY AND MUSCULAR OXYGEN UPTAKE KINETICS BEFORE AND AFTER PROLONGED SPACEFLIGHT  Uwe Hoffmann, Alan D. Moore, Uwe Drescher

13:00  I.d-2 | The flight experiment «Sonocard» on board the International Space Station (ISS) - the contactless study of autonomic cardiovascular regulation during sleep in long term space flight  Irina Funtova, Roman Baevsky, Elena Luchitskaya, Irina Slepchenkova

13:00  I.d-3 | The flight experiment “Pneumocard” influences of long term space flight on autonomic cardiovascular regulation, respiration and cardiac performance  Elena Luchitskaya, Roman Baevsky, Irina Funtova, Anna Chernikova, Jens Tank
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<td>13:00</td>
<td>I.d-4</td>
<td>Changes in protein composition of cosmonaut's urine after prolonged orbital flights: cardio-vascular systems' related proteins</td>
<td>Liudmila Pastushkova, Eugene Tiys, Alex Kononikhin, Igor Popov, Igor Dobrokhotov, Vladimir Ivanesenko, Irina Larina, Eugene Nikolaev</td>
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<td>13:00</td>
<td>I.d-5</td>
<td>Influence of Microgravity on P2 Signaling in Primary Endothelial and Smooth Muscle Cells to Unveil the Cardiovascular Deconditioning in Astronauts</td>
<td>Yu Zhang, Andreas Pansky, Matthias Kassack, Edda Tobiasch</td>
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<td>13:00</td>
<td>I.d-6</td>
<td>BP Reg on ISS: Predicting Fainting in Astronauts</td>
<td>Isabelle Marcil, Derrick Piontek, Daniel Provençal, Danielle Greaves, Richard Hughson</td>
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<td>13:00</td>
<td>I.d-7</td>
<td>Haemodynamic reactions to orthostatic stress under Martian and Lunar Gravity on parabolic flights</td>
<td>Paula Beck, Peter Gauger, Luis Beck, Frank Wappler, Ulrich Limper</td>
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<td>13:00</td>
<td>I.d-9</td>
<td>Gravity effects on heart rate variability during partial G parabolic flights</td>
<td>Devy Widjaja, Steven Vandeput, Sabine van Huffel, Andre E. Aubert</td>
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<td>13:00</td>
<td>I.d-10</td>
<td>Cardiac adaptation to deconditioning after 5-days of head-down bed-rest and effectiveness of artificial gravity as countermeasure: a Doppler-echocardiographic study.</td>
<td>Enrico Caiani, Pierre Massabuau, Lynn Weinert, Roberto Lang, Pierre Vaida</td>
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<td>13:00</td>
<td>I.d-11</td>
<td>Monitoring Cephalad Fluid Shift Induced Nasal Tissue Swelling in 70-Day 6° Head-down Tilt</td>
<td>Bryan Caldwell, Bruce Halpern, Kim Binsted, Jean Hunter</td>
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13:00 I.d-13 | INFLUENCE OF NEGATIVE PRESSURE BREATHING ON CARDIOVASCULAR SYSTEM AND FLUID REDISTRIBUTION IN HUMANS DURING HEAD-DOWN TILT
Julia Popova, Yury Semenov, Tatiana Eryukova, Galina Reushkina, Alexander Dyachenko, Alexander Suvorov

13:00 I.d-14 | Influence of negative pressure breathing on cerebral circulation (mathematical model)
Yury Semenov, Alexander Dyachenko

13:00 I.d-15 | The relationship between exercise tolerance, arterial blood flow and muscle perfusion after 56 days local muscle unloading.
Tobias Weber, Michel Ducos, Edwin Mulder, Jochen Zange, Wilhelm Bloch, Jörn Rittweger

13:00 I.d-16 | Heart rate variability analysis of autonomic control strategies to changes in lower body negative pressure.
Roman Baevsky, Kouhyar Tavakolian, Vassily Rusanov, Andrew Blaber

13:00 I.d-17 | Breathing exercises during late pregnancy in a microgravity-like environment.
Martina Anna Maggioni, Hanns-Christian Gunga, Oliver Opatz, Alexander Stahn, Mathias Steinach, Giampiero Merati

13:00 I.d-18 | Modifying heart autonomic control through attention regulation: a new approach to cardiac rehabilitation.
Alexandre Laurin, Kouhyar Tavakolian, Roman Baevsky, Andrew Blaber

13:00 I.d-19 | PERIPHERAL ARTERY and VEIN MORPHOLOGICAL CHANGE DURING LONG TERM CONFINEMENT (MARS 500)
Philippe Arbeille, R Provost, N Vincent, Andre E. Aubert

13:00 I.d-20 | No effect of hypoxia on blood coagulation results from the Concordia station, Antarctica
Annemarie Venemans, Anja Schreijer, Frits Rosendaal, Suzanne Cannegieter
13:00  I.E - ARTIFICIAL GRAVITY

13:00  I.e-1 | Ground-based centrifuge paradigm to study vestibular adaptation to altered gravity levels
        Eric Groen, Jelte Bos

13:00  I.e-2 | Influence of artificial gravity training on EEG during tilt table testing
        Albert Niepel, Stefan Schneider, Helmut Hinghofer-Szalkay, Melanie von der Wiesche, Nandu Goswami

13:00  I.e-3 | Exercise vs. artificial gravity a neuro-cognitive perspective
        Tobias Vogt, Stefan Schneider, Vera Abeln, Heiko Strüder

13:00  I.e-5 | Artificial gravity on the ESA Short-Arm Human Centrifuge: Does the cardiovascular response depend on perception of verticality?
        Pierre-François Migotte, Quentin Delière, Olivier Mairesse, Xavier Neyt, Nathalie Pattyn, Floris Wuyts, Gilles Clément

13:00  I.e-6 | Gender Variances in Cardiovascular Regulatory Response on the European Space Agency Short-Arm Human Centrifuge
        Charles Laing, Edwin Mulder, Carole A D Leguy, Jörn Rittweger, Luis Beck

13:00  I.e-7 | Red blood cell rheological properties under the influence of artificial gravity
        Mariijke Grau, Stefan Schneider, Tobias Vogt, Vera Abeln, Vanja Sebastian Zander, Wilhelm Bloch

13:00  I.e-8 | Microarray analysis reveals changes in blood and saliva gene expression profiles in response to artificial gravity as experienced on the short-arm human centrifuge
        Patrick de Boever, Vera Abeln, Tobias Vogt, Heiko Strüder, Stefan Schneider

13:00  I.e-9 | Artificial gravity as a partially effective musculoskeletal countermeasure
        Jörn Rittweger, Marie-Pierre Bareille, Gilles Clément, Dag Linnarsson, William Paloski, Floris Wuyts, Jochen Zange, Oliver Angerer
13:00  I.e-10 | Can skin temperature measurement contribute to GLOC prediction?  
Oliver Opatz, M. Maggioni, A. Stahn, M. von der Wiesche, H. Habazettl, H.c. Gunga

13:00  I.e-11 | Exposure to artificial gravity induced by centrifugation on the ESA-Short-Arm Human Centrifuge (SAHC): experiences in terms of operational aspects  
Melanie von der Wiesche, Alexandra Noppe, Francisca May, Andrea Nitsche, Wolfgang Doering, Vanja Sebastian Zander, Guido Petrat, Ralf Anken

13:00  I.e-12 | Design and validation of Vicon Bonita motion capture system for use on the ESA short-radius human centrifuge in Cologne, Germany  
Stefan Madansingh, Uwe Mittag, William Paloski, Jörn Rittweger

13:00  I.e-13 | :enviFuge An innovative short arm centrifuge for space medicine and life science experiments under artificial gravity conditions  
Timo Frett, Michael Mayrhofer, Johann Schwandtner, Guido Petrat

13:00  I.e-14 | The Artificial Gravity Platform, AGP; a very Large Radius Human Centrifuge  
13:00  **I.F - TECHNOLOGY FOR HUMAN SPACEFLIGHT**

13:00  **I.f-1 | An Update on Manned Commercial Space Transportation Issues in the U.S.**
Melchor Antuñano

13:00  **I.f-2 | New Developments in Medical Technologies and their Implications for Space Medicine**
Melchor Antuñano

13:00  **I.f-4 | Problems and prospects of air quality on board the ISS**
Valery Bogomolov, Lana Mukhamedieva, Dmitry Ozerov

13:00  **I.f-6 | ESA Crew Medical Operations**
Lothar Mies, Filippo Castrucci, Frits de Jong, Simon Evetts

13:00  **I.f-7 | Overview of an Integrated Medical System for Exploration Missions**
Sharmi Watkins, David Rubin

13:00  **I.f-8 | Challenges for Anesthesia in Space**
Christian Lüthen

13:00  **I.f-9 | The best method of conducting cardiopulmonary resuscitation in space: A systematic review**
Rochelle Velho

13:00  **I.f-10 | Tele-skin diagnosis by High- Definition Video Camera in the International Space Station**
Hiroshi Ohshima, Nobuhiro Sakata, Satoru Ishida, Chiaki Muaki

13:00  **I.f-11 | This project will develop a comprehensive system for monitoring vital signs, it is important that patients are treated in ambulances are monitored and data can be viewed through a computer or a smartphone.**
Víctor Hugo Ortiz Flores, Carlos Salicrup Díaz de León, Diana Bueno Hernández
13:00  I.f-12 | SKIN B - A Physiological Experiment for Skin Research on the ISS
       Mario Schweitzer, Katrin Stang
13:00  I.f-13 | Hyperelastic Pressure Sensor Development for Use in Extravehicular Mobility Unit
       Allison Anderson, Yigit Menguc, Robert Wood, Dava Newman
13:00  I.f-14 | A Space Medicine Wearable System Prototype
       Vincenzo Guarnieri, Matteo Stoppa, Matteo Maria Lamantea, Cesare Lobascio
13:00  I.f-15 | Features of the development of experimental peritonitis in modeling the effects of microgravity
       Mikhail Baranov, Dmitriy Astakhov, Dmitriy Panchenkov
13:00  I.f-17 | Development of novel ISRU and ISFR technologies to sustain future manned missions on Moon and Mars
       Giacomo Cao, Alessandro Concas, Gianluca Corrias, Roberta Licheri, Roberto Orrù, Massimo Pisu
13:00  I.f-19 | The role of the Biomedical Engineer in the MARS2013 Analogue Field Simulation (Austrian Space Forum)
       Robert Terlevic, Paavan Gorur, Andrea Stadler, Egon Winter, Ernst Toferer, Gernot Grömer, Thomas J. Luger
15:00  IIIA - CARDIOVASCULAR SYSTEM
15:00  IIIa-1 | BION PROGRAM: HEART RATE AND BLOOD PRESSURE DURING LOCOMOTOR ACTIVITY IN THE OPEN FIELD AND TREADMILL RUNNING IN C57/B6 MICE
       Olga Vinogradova, Anfisa Popova, Daria Tsvirkun, Anatoly Brovik, Marc-Antoine Custaud, Aleksandr Andreev-Andrievskii
15:15  IIIa-2 | CCISS, Vascular and BP Reg: Canadian space life science research on ISS
       Richard Hughson, Danielle Greaves, Andrew Robertson, Kevin Shoemaker, Philippe Arbeille
15:30  IIIa-3 | Hypotensive and Vasodilatory Effects of 3 - 6 Months of Spaceflight
Peter Norsk, Ali Asmar, Morten Damgaard, Niels Juel Christensen

15:45  IIIa-4 | Changes in ventricular repolarization heterogeneity induced by 5-days bed rest immobilization, and effects of exercise countermeasure
Enrico Caiani, Alessandro Pellegrini, Juan Bolea, Rute Almeida, Pablo Laguna, Pierre Vaida

16:00  IIIa-5 | Assessment of muscle pump dynamics under orthostatic stress in the lower limbs
Carole A D Leguy, Luis Beck, Jakob Kümmel, Jochen Zange, Bergita Ganse, Jörn Rittweger, Andrew Blaber

16:15  IIIa-6 | Visual Control of the Cardiovascular System during Head-down Tilt Bed Rest
Hervé Normand, Michaël Marais, Gilles Clément, Philippe Arbeille, Joseph McIntyre, Romain Lericollais, Pierre Denise

15:00  IIIB - RADIATION - PART 2

15:00  IIIb-1 | NASA Space Radiobiology: CNS Risks for Exploration
Francis Cucinotta

15:15  IIIb-2 | Apoptosis and oxidative stress in different brain regions of rats induced by heavy ion radiation and Dragon's Blood's radioprotective effects
Runhong Lei, Nan Zhao, Hong Ma, Yulin Deng

15:30  IIIb-3 | Analysis of gene and exon expression signatures as biomarkers for low and high LET radiation exposure and individual radiation sensitivity (ESA IBER project GYMBRASS)
Roel Quintens, Marjan Moreels, Kevin Tabury, Ellina Macaeva, Arlette Michaux, Nicole Averbeck, Alexander Choukèr, Sarah Baatout

15:45  IIIb-4 | The Role of Nuclear Factor ? B in the Cellular Response to Space Relevant Radiation
Kristina Koch, Christine E. Hellweg, Christa Baumstark-Khan, Guenther Reitz
IIIb-5 | Preparatory Tests for the Space Experiment „Cellular Responses to Radiation in Space, CellRad”
Christine E. Hellweg, Shahana Dilruba, Astrid Horn, Sebastian Feles, Claudia Schmitz, Luis F. Spitta, Luca Briganti, Markus Franz, Jürgen Segerer, Thomas Berger, Christa Baumstark-Khan, Guenther Reitz

IIIb-6 | Effects of high- and low- LET ionising radiation on plants: are plants ready for spaceflight?
Carmen Arena, Roberta Paradiso, Veronica de Micco

16:15

IIIc-1 | The Antarctic 'CHOICE'-Study as an analogue for exploration class missions: the impact on innate and adaptive immunity
Brian Crucian, Matthias Feuerecker, Marjan Moreels, Satish Mehta, Roel Quintens, Alex Salam, Ines Kaufmann, Raymond Stowe, Sarah Baatout, Duane Pierson, Clarence Sams, Alexander Choukèr

IIIc-2 | The Psychological Impact of a One-Year Deployment to the Amundsen-Scott South Pole Research Station: A Twelve Year Analysis of Clinical Diagnoses
Christian Otto

IIIc-3 | Teamwork in the Antarctic: Cohesion in Isolated, Confined, and Extreme Environments
Steve W. J. Kozlowski, Chu-Hsiang Chang, Marina Pearce, Samantha K. Baard, Christine M. Kermond, Heng C. Xie

IIIc-4 | Tonic and phasic individual differences in psychomotor vigilance and sleep during an Antarctic overwintering.
Olivier Mairesse, Eoin McDonald-Nethercott, Plouzané Cortoos, Helio Fernandez-Tellez, Grégory Collet, Nathalie Pattyn

IIIc-5 | Long-term isolation at Antarctica- About psychophysiological and neurophysiological changes and the effect of exercise
Vera Abeln, Stefan Schneider, Eoin MacDonald-Nethercott

IIIc-6 | Overwintering in Antarctica, and coming home
Amaury Solignac, Claude Bachelard
17:00  **PLENARY SESSION 3 - SALT BALANCE: NEW PERSPECTIVES FOR PHYSIOLOGY, PATHOPHYSIOLOGY AND CLINICAL**

17:00  **Plenary Session 3-1 | Salt balance: From space experiments to revolutionizing new clinical concepts**  Rupert Gerzer

17:25  **Plenary Session 3-2 | Salt-dependent chemotaxis: a new concept for the role of macrophages in salt balance**  Silke Müller, Thomas Quast, Agnes Schröder, Stephanie Hucke, Luisa Klotz, Jonathan Jantsch, Rupert Gerzer, Ruth Hemmersbach, Waldemar Kolanus

17:45  **Plenary Session 3-3 | High dietary NaCl- and protein intake: effects on bone turnover**  Martina Heer, Natalie Baecker, Petra Frings-Meuthen

18:05  **Plenary Session 3-4 | Sodium metabolism: health research in space experiments**  Jens Titze
08:30  **IVA - BONE AND MUSCLE**

08:30  **IVa-1 | MUSCLES IN SPACE**
Marco Narici

08:45  **IVa-2 | Microgravity vs. bed rest: a comparison of the soleus muscle proteome**
Agnese Viganò, Manuela Moriggi, Michele Vasso, Paolo Cerretelli, Cecilia Gelfi

09:00  **IVa-3 | Homer expression patterns at the neuromuscular junction following various skeletal muscle activities and simulated microgravity in rat and human**
Dieter Blottner, Michele Salanova, Jörn Rittweger, Benedikt Schoser, Asa Beijer, Saroj Chudal

09:15  **IVa-4 | Bone tissue and space environment**
Laurence Vico

09:30  **IVa-5 | ATTENUATION OF BONE LOSS AND ACCELERATION OF FRACTURE HEALING BY ACOUSTIC RADIATION FORCE**
Yi-Xian Qin, Jacky Cheng, Fred Serrahsu, Wei Lin, Long Bi, Maria Pritz, Shu Zhang

09:45  **IVa-6 | Muscle-bone interaction as a prerequisite for bone health**
Jörn Rittweger

08:30  **IVB - BIOREGENERATION**

08:30  **IVb-1 | Water Walls Life Support Architecture: Bio-Regenerative and Forward Osmosis Functional Process**
Marc Cohen, Renée Matossian, Rocco Mancinelli, Michael Flynn

08:45  **IVb-2 | The ModuLES Philosophy related research in biology, ecology and life support system development**
Klaus Slenzka, Sandra Podhajsky, Antonella Sgambati, Jason Hochstein, Bernd Schmeyers
09:00  IVb-3 | C.R.O.P. Combined Regenerative Organic-food Production: An integrated approach to the reutilization of yellow water and other organic wastes
Gerhild Bornemann, Jens Hauslage, Kai Waßer, Ruth Hemmersbach, Ralf Anken

09:15  IVb-4 | The LUNAR PALACE 1 pilot plant facility as an integration test-bed for bioregenerative life support systems
Chen Dong, Yuming Fu, Dawei Hu, Beizhen Xie, Boyang Jia, Enzhu Hu, Leyuan Li, Hui Liu, Lingzhi Shao, Minjuan Wang, Youcai Qin, Houkai Zhang, Juan Yu, Liang Li, Hong Liu

09:30  IVb-5 | Space life science in BIT
Yulin Deng, Hong Ma, Kaleem Ullah, Yongqian Zhang, Li Wang, Rongji Dai, Xuefei Lv, Lianjing Zhou, Hong Qing, Fengyuan Zhuang

09:45  IVb-6 | The Response of MLO-Y4 Cells under Simulated Microgravity to Online-Fluid shear
Xiao Yang, Lian-Wen Sun, Xin-Tong Wu, Yu-Bo Fan

10:30  VA - STUDENT SESSION

10:30  Va-1 | Gravitational loading alone is insufficient to maintain bone strength
Michel Ducos

10:45  Va-2 | Bending and torsion predominate the in vivo human tibia deformation regimes during locomotive activities and its relationship to muscular contractions
Peng-Fei Yang, Maximilian Sanno, Bergita Ganse, Timmo Koy, Gert-Peter Brueggemann, Lars Peter Müller, Jörn Rittweger

11:00  Va-3 | On the development of a 1D wave propagation model for the analysis of the cardiovascular response to gravitational stress
Joke Maria Theodora Keijzers, Carole A D Leguy, Wouter Huberts, Jörn Rittweger, Frans N van de Vosse
11:15 Va-4 | GRAVI-SENSITIVITY OF SIGNAL TRANSDUCTION IN PRIMARY HUMAN T LYMPHOCYTES RESULTS FROM A COORDINATED SOUNDING ROCKET AND PARABOLIC FLIGHT EXPERIMENT
Swantje Hauschild, Svantje Tauber, Cora S. Thiel, Katrin Paulsen, Claudia Crescio, Christian Secchi, Isabell Buttron, Christiane Raig, Liliana Layer, Claudia Philpot, Hartwin Lier, Eva Hürlimann, Josefine Biskup, Antonella Pantaleo, Angela Saba, Augusto Cogoli, Proto Pippia, Oliver Ullrich

11:30 Va-5 | Changes in gene expression and morphology of chondrocytes cultured on a Random Positioning Machine
Ganna Aleshcheva, Xiao Ma, Markus Wehland, Ruth Hemmersbach, Daniela Grimm

11:45 Va-6 | Spacecraft Failure Detection by Experienced Pilots in a Motion Simulator
Justin Kaderka, Kevin Duda, Alan Natapoff, Charles Oman

10:30 VB - COMMERCIAL HUMAN SPACEFLIGHT: PREPARING FOR A NEW ERA

10:30 Vb-1 | Life-Sciences Research Opportunities in Commercial Suborbital Space Flight
Mark Shelhamer

10:45 Vb-2 | Suborbital Aerospace Passengers Training Certification
Laura Andre-Boyet

11:00 Vb-3 | Challenges for suborbital space flight passengers - Session VIB - Commercial Human Spaceflight: Preparing for a New Era
Ellen Wilschut, Wouter Vos, Ries Simons, Eric Groen, Suzanne Nooij

11:15 Vb-4 | ESTABLISHING A REGULATORY FRAMEWORK FOR THE DEVELOPMENT AND OPERATIONS OF SUB-ORBITAL AND ORBITAL AIRCRAFT (SOA) IN THE EU
Jean-Bruno Marciacq, Annette Ruge
11:30  Vb-5 | Doctor, may I travel into space?
      Ries Simons, Marck Haerkens, Eric Groen

11:45  Vb-6 | FAA Center of Excellence Flight Crew Medical Standards and Spaceflight Participant Medical Acceptance Guidelines
      Melchor Antuñano, Richard Jennings, James Vanderploeg, Jeffrey Davis

13:00  POSTERSESSION II (II.A – II.F)

13:00  II.A - MUSCULOSKELETAL SYSTEM

13:00  II.a-1 | A refined Mechanostat Model of Bone Transformation
      Uwe Mittag, Andreas Kriechbaumer, Jörn Rittweger

13:00  II.a-2 | Spongy bone structure and mechanical response
      Christin Heinig, Marion Bartsch, Uwe Mittag, Jörn Rittweger, Kathirvel Ganesan, Lorenz Ratke

13:00  II.a-3 | Muscle forces - Bone deformations - A novel approach to determine muscle forces - corresponding to measured tibia deformations
      Andreas Kriechbaumer, Uwe Mittag, Jörn Rittweger

13:00  II.a-4 | Effects of KHCO₃ on bone resorption during high protein in bed rest (MEP Study)
      Martina Heer, Judith Buehlmeier, Scott M. Smith, Natalie Baecker, Petra Frings-Meuthen

13:00  II.a-5 | Deformation stimulates bone feasibility of an innovative surgical approach for in-vivo measurements of bone deformation
      Bergita Ganse, Peng-Fei Yang, Gert-Peter Brueggemann, Timmo Koy, Jörn Rittweger, Lars Peter Müller

13:00  II.a-6 | Effects of load on bone remodelling
      Janne E. Reseland, Anil Kulkarni, Marie-Francoise Doursout, Catherine Ambrose, Alamelu Sundaresan
13:00  **II.a-7** | The Response of MLO-Y4 Cells under Simulated Microgravity to Online-Fluid shear  
*Xiao Yang*, Lian-Wen Sun, Xin-Tong Wu, Yu-Bo Fan

13:00  **II.a-8** | New Aspects of Mesenchymal Stem Cell Differentiation after Osteogenic Induction as well as Exposure to Ionizing Radiation  
*Patrick Lau*, Yueyuan Hu, Bikash Konda, Christa Baumstark-Khan, Guenther Reitz

13:00  **II.a-9** | Response of Biomarkers of Cartilage Metabolism to Immobilisation during 21-days of HDT-Bed Rest  
*Anna-Maria Liphardt*, Annegret Mündermann, Seungbum Koo, Thomas P. Andriacchi, Silvia Achtzehn, Martina Heer, Joachim Mester

13:00  **II.a-10** | What type of muscle performance assessment is most sensitive to change with unloading: isokinetic, isometric or isotonic tests?  
*Lori Ploutz-Snyder*, Roxanne Buxton, Robert Ploutz-Snyder, Jeffrey Ryder

13:00  **II.a-11** | Simulation of Muscle Fiber Contraction Dynamics  
*Felix Kaineder*, Lars Mehnen, Johannes Martinek

13:00  **II.a-12** | Effects of 5-days HDT bed rest with and without countermeasures on myoelectrical activity in vastus lateralis and gastrocnemius medialis  
*Vladimir Shushakov*, Markus Grünwald, Norbert Maassen, Jochen Zange

13:00  **II.a-13** | One problem found in people traveling space is decreased bone mass, and consequently increasing calcium levels in the urine. The project proposal is to establish a relationship between bone decalcification, the amount of calcium excreted and the time this takes place and the time of recovery of normal levels by treatment.  
*Víctor Hugo Ortiz Flores*, Diana Bueno Hernández
II.a-14 | In this project we develop a NEMS (Nano Electrical Mechanical Systems) for the regulation of calcium in the bone, indicating when it reaches the level of normal calcium and prevent bone breakdown, these tests were compared with tests clinics conducted by specialists. 

Víctor Hugo Ortiz Flores, Diana Bueno Hernández

13:00 II.B - TECHNOLOGY & HUMAN PERFORMANCE

13:00 II.b-2 | Markers of Susceptibility to Neurobehavioral Decrement in Space Flight

Namni Goel, Mathias Basner, Hengyi Rao, David F. Dinges

13:00 II.b-4 | ISS MISSIONS: ELEVATED WORKLOAD AND REDUCED SLEEP DURATION

David F. Dinges, Mathias Basner, Daniel J. Mollicone, Christopher W. Jones, Adrian Ecker, Rachel Bartels, Christopher Mott, Mike Sutdna

13:00 II.b-5 | ISS-SLEEP-KIT - Sleeping Bag for the International Space Station

Barbara Imhof, Waltraud Hoheneder, Kaspar Vogel, Laura Drudi

13:00 II.b-6 | Effect of 72 hours' Sleep Deprivation under Isolation and Confinement on Emotion, Cognition and Performance

Xueyong Liu, Xiaolu Jing, Baibo Qin, Jun Wang, Fang Liu, Jing Feng, Weifen Huang, Yanqiang Bai, Bin Wu

13:00 II.b-7 | Effects of 72 h Sleep Deprivation under Narrow and Isolated Environment on Emotion, Cognition and Performance

Bin Wu, Xueyong Liu, Xiaolu Jing, Haibo Qin, Jun Wang, Fang Liu, Weifen Huang, Yanqiang Bai
II.b-8 | We develop a device and acquiring electroencephalogram signals via dynamic neural network and wavelet for classification of the signals using an associative memory classifier alpha-beta Johnson Moebius modified. We show the simulation results and experimental development.
   Víctor Hugo Ortiz Flores, Diana Bueno Hernández

II.b-9 | New smartphone technologies: Motivating astronauts to exercise!
   André Rosenberger, Nora Petersen, Patrick Jaekel

II.b-10 | The grip force controller differentiates the inertial and gravitational components of the load
   Olivier White

II.b-11 | Astronaut training for physiology experiments - The importance of a dedicated approach
   Laura Andre-Boyet, Elisabeth Jambor

II.b-12 | Individual performance styles of professional operator's activity.
   Yaroslav Boritko, Vadim Gushin, Alla Vinokhodova, Angelina Chekalina

II.b-13 | DEXTEROUS MANIPULATION EXPERIMENT PREPARATION FOR THE INTERNATIONAL SPACE STATION
   Vladimir Pletser, Jean-Louis Thonnard, Philippe Lefevre, Joseph McIntyre, Bart Desoete, Wim Derkinderen, Dirk Claessens, Massimo Penta, André Thibaut

II.b-15 | Human Behaviour and Performance Training: Lessons from analogue environments for space research
   Nathalie Pattyn, Susan Buckle, Loredana Bessone, Marc Shepanek

II.b-16 | Results from the ICEBERG workshop on Antarctica stations, submarine patrols, and space missions
   Amaury Solignac, Charlotte Poupon
13:00  II.b-17 | The Endocannabinoid system: key regulator of adaptation to chronic stress? Results from winter-over missions at the Antarctic Concordia station
Matthias Feuerecker, Ulrike Thieme, Daniela Hauer, Brian Crucian, Ines Kaufmann, Marjan Moreels, Satish Mehta, Roel Quintens, Alex Salam, Ray Stowe, Sarah Baatout, Duane Pierson, Clarence Sams, Detlef Thieme, Gustav Schelling, Alexander Chouker

13:00  II.b-18 | Sleep Disordered Breathing at Antarctica
Helio Fernandez-Tellez, Nathalie Pattyn, Olivier Mairesse, Pierre-François Migeotte, Aisha Cortoos, Eoin McDonald-Nethercott, Xavier Neyt, Romain Meeusen

13:00  II.C - ANALOG ENVIRONMENTS

13:00  II.c-1 | 520-day Mars Mission Simulation Reveals Changes in Crew Activity Levels and Alterations of Sleep-Wake Patterns
Mathias Basner, David F. Dinges, Daniel J. Mollicone, Igor Savelev, Adrian Ecker, Adrian Diantonio, Christopher W. Jones, Eric C. Hyder, Namni Goel, Kevin Kan, Boris V. Morukov, Jeffrey P. Sutton

13:00  II.c-2 | Autonomic regulation of blood circulation during extended isolation
Vassily Rusanov, Evgenii Bersenev, Anna Chernikova

13:00  II.c-3 | ESA Standardized Measures during Mars-500 - the Link between Scientific Protocols
Elena Feichtinger, Jennifer Ngo-Anh, Patrik Sundblad, Martin Zell, Vadim Gushin, Alla Vinokhodova, Galina Vassilieva, Evgenii Bersenev

13:00  II.c-4 | Improving microbial sampling protocols for space exploration through astronaut operations in analogue settings: CAVES 2012
Stefan Leuko, Loredana Bessone, Petra Rettberg

13:00  II.c-5 | The hypoxic bedrest research programme
Ola Eiken, Igor B. Mekjavic
13:00  II.c-6 | Technologies for Humans in Space and with terrestrial Application to test in the :envihab test facility at DLR Cologne
Norbert Henn, Stefan Belz, Ulrich Kuebler

13:00  II.c-7 | Habitat Technology Research at DLR
Dominik Quantius, Daniel Schubert, Volker Maiwald, Jens Hauslade, Gerhild Bornemann, Kai Waßer, Juergen Hill, Norbert Henn, Hans-Günter Ruyters, Markus Braun

13:00  II.c-8 | JOINT EUROPEAN PARTIAL-G PARABOLIC FLIGHTS: TWO CAMPAIGNS FOR SCIENCE AND EXPLORATION AT MOON AND MARS GRAVITY LEVELS
Vladimir Pletser, Sebastien Rouquette, Ulrike Friedrich, Jean-Francois Clervoy, Therry Gharib, Frederic Gai

13:00  II.D - CELLULAR & MOLECULAR RESEARCH

13:00  II.d-1 | The impact of hypergravity on human follicular thyroid cancer cells
Xiao Ma, Ganna Aleshcheva, Markus Wehland, Jessica Pietsch, Ruth Hemmersbach, Jens Hausslage, Kai Waßer, Johann Bauer, Daniela Grimm

13:00  II.d-2 | Investigation of microgravity effects on basic immune functions - The TRIPLELUX-B experiment
Eckehardt Unruh, Peter-Dietrich Hansen

13:00  II.d-3 | Proteome analysis of human thyroid cells cultured on a Random Positioning Machine
Jessica Pietsch, Johann Bauer, Jirka Grosse, Gerhard Weber, Albert Sickmann, Robert Wildgruber, Manfred Infanger, Daniela Grimm

13:00  II.d-4 | Searching for gravity-sensitive proteins in human thyroid cells
Stefan Riwaldt, Jessica Pietsch, Johann Bauer, Albert Sickmann, Gerhard Weber, Robert Wildgruber, Jirka Grosse, Manfred Infanger, Daniela Grimm
13:00  II.d-5 | Spheroid formation of human thyroid cancer cells cultured on a 2D-clinostat and a Random Positioning Machine
   Elisabeth Warnke, Jessica Pietsch, Markus Wehland, Herbert Schulz, Kathrin Saar, Norbert Huebner, Johann Bauer, Manfred Infanger, Mark Görög, Ruth Hemmersbach, Daniela Grimm

13:00  II.d-6 | Differential effects of simulated microgravity on cell cycle and proliferation of human endothelial-like EA.hy 926 cells and human neuroblastoma SHSY-5Y cells
   Alisa Sokolovskaya, Tatiana Ignashkova, Aleksey Moskovtsev, Victor Baranov, Aslan Kubatiev

13:00  II.d-7 | Short-Term Effects of Parabolic Flight in Endothelial Cells: What Roles Play Hypergravity and Vibration?
   Markus Wehland, Xiao Ma, Markus Braun, Jens Hauslage, Ruth Hemmersbach, Johann Bauer, Jirka Grosse, Manfred Infanger, Daniela Grimm

13:00  II.d-8 | Osteocyte-Specific Connexin43 Transgenic Mice Decreases Bone Mass and the Response to Tibia Loading
   Huiyun Xu, Sumin Gu, Manuel Riquelme, Peng Shang, Jean Jiang

13:00  II.d-9 | The Proliferation of Mouse Osteoblast-like MC3T3-E1 Cells is Promoted under Hypo-magnetic Field Environment
   Jian Zhang, Zhouqi Yang, Peng Shang

13:00  II.d-10 | The Genetic Analyses on Human Hair and Mice Skin
   Masahiro Terada, Shin Yamada, Masaya Seki, Rika Takahashi, Akira Higashibata, Hideyuki Majima, Hiroshi Ohshima, Yoshinobu Ohira, Noriaki Ishioka, Chiaki Mukai

13:00  II.d-11 | The Effect of Microgravity on Secretory Protein Expression
   Maija Mednieks, Renee Rubenstein, Joseph Burleson, Arthur Hand
13:00   II.d-13 | Will omics technologies increase our knowledge on human health and performance in spaceflight analogues such as the Antarctic station Concordia?  
Patrick de Boever, Dirk Valkenberg

13:00   II.d-14 | LINKING EXPERIMENTAL RESULTS IN SPACE RESEARCH  
Johann Bauer, Jessica Pietsch, Daniela Grimm

13:00   II.d-15 | Influence of g conditions on the larval development of the gravity sensing structures in fish (Oreochromis mossambicus)  
Dennis Chr. Grimm, Miriam Knie, Denis Shcherbakov, Reinhard Hilbig

13:00   II.E - ASTROBIOLOGY

13:00   II.e-1 | Experience of microbial implantation for prophylaxis of Staphylococcus aureus colonization of nasal mucous in experiment on human isolation  
Viacheslav Ilyin, Natalia Kiriukhina, Julia Morozova

13:00   II.e-2 |AUTOPROBIOTICS IN PREVENTION OF INTESTINAL DISBACTERIOSIS OF OPERATORS IN LONG-TERM EXPERIMENT IN CONFINED HABITAT  
Viacheslav Ilyin, Nonna Usanova, Liubov Starkova, Julia Morozova, Alexander Suvorov

13:00   II.e-3 | Changes of polydimethylsiloxane's property with different fineness before and after microbial contamination under the condition of space station internal environment  
Yi Sun, Kaiyu Gao, Zhongchi Li, Hong Liu

13:00   II.e-4 | Comparative Investigations on Biofilm and Planktonic cells of Deinococcus geothermalis as Mission Preparation Tests of the Experiment BOSS on EXPOSE R-2  
Corinna Panitz, Petra Rettberg, Jan Frösler, Hans-Curt Flemming, Elke Rabbow, Simon Barczyk
13:00 II.e-5 | Research on Gas Exchange of Oxygen and Carbon Dioxide in the 'microalgae-mice' System
Ai Weidang, Guo Shuangsheng, Dong Wenping

13:00 II.e-6 | Physiologic and Secondary Metabolic Responses of Gynura Bicolor to Different LED Light Quality in Super-elevated carbon Dioxide
Shuangsheng Guo

13:00 II.e-7 | BIOSMHARS: BIOcontamination Specific Modelling in HAbitats Related to Space
Audrey Berthier, Natalie Leys, Rob van Houdt, Alexander Tikhomirov, Natalia Novikova, Viacheslav Ilyin, Sergey Kharin, Julia Morozova, Ilpo Kulmala, Matti Lehtimäki, Eero Kokkonen, Pertti Pasanen, Anna Maria Veijalainen, Anniina Hellsten, Hafid Abaibou

13:00 II.e-8 | The ANTI-BACS project inside the Concordia Antarctic research station: in-field evaluation of antimicrobial materials, surfaces and textiles in extreme environmental habitats
Ralf Moeller, Claudia Hahn, Petra Rettberg, Guenther Reitz

13:00 II.F - EDUCATION & OUTREACH

13:00 II.f-1 | Future Challenges in Managing Human Health and Performance Risks for Space Flight
Barbara Corbin, Michael Barratt, John Charles

13:00 II.f-2 | System Life Science under Space Conditions. Some Thoughts on Conceptual Frameworks, the Unified Modeling Language and Model Standardisation
Helmut Duwe, Patrick Lau, Uwe Mittag

13:00 II.f-3 | An Evidence Base for Spaceflight Risks in Wikipedia
Craig Kundrot, Jennifer Steil, Sarah Lumpkins, Neal Pellis

13:00 II.f-4 | Expanding the Educational Frontiers of Space Research and Medicine
Marlene MacLeish, William Thomson
13:00  **II.f-6 | Activity for popularization of studies in the area of space biology and medicine in Russia**  
Mark Belakovskiy, Oleg Voloshin, Anna Kussmaul, Irina Ponomareva, Larisa Cheveleva

13:00  **II.f-8 | OPTICKS, SPACE TRAVEL AND VISUAL MOONBOUNCE**  
Daniela de Paulis

13:00  **II.f-9 | The ISECG Global Exploration Roadmap**  
Andrea Boese, Sylvie Espinasse, Juergen Hill, Bernhard Hufenbach, Christian Lange, Kathy Laurini, Naoki Sato, Francois Spiero

13:00  **II.f-10 | Works of Art for Long-Term Astronauts**  
Kirsten Johannsen

13:00  **II.f-11 | We will create a research and development in biomedical engineering aerospace center, which will provide demand within developing medical devices to aerospace. One of the main objectives of the center is economic growth, creating sources of high quality jobs, generating companies, domestic and foreign investment and an exchange academic culture among students and researchers.**  
**Víctor Hugo Ortiz Flores**, Carlos Salicrup Díaz de León, Diana Bueno Hernández

13:00  **II.f-12 | Performing simulations systems through devices such as: video games, Kinect, mobile devices: ipads, ipod, iphone, tablets, Wii, among others. In order to understand the physiological conditions of the people in the area exposed to microgravity, and then develop devices to check or improve existing systems**  
**Víctor Hugo Ortiz Flores**, Diana Bueno Hernández
13:00  II.f-13 | TOWARDS A UNIFORM AND HARMONIZED SYSTEM OF COMMERCIAL ACTIVITIES IN OUTER SPACE. INTERACTION BETWEEN INTERNATIONAL SPACE STATIONS ORBITING THE MOON, MARS AND OTHER CELESTIAL BODIES AND ASTEROID MINING ACTIVITIES. COMMERCIAL AND INTELLECTUAL PROPERTY ISSUES. Jordi Sandalinhas

13:00  II.f-14 | International jurisdiction, recognition and enforcement of resolutions in liability insurance matters related to accidents occurred during private commercial activities in Outer Space. Arbitration of Disputes relating to Outer Space Activities Jordi Sandalinhas

15:00  VIA - IMMUNOLOGY

15:00  Vla-1 | From Space to the Patient: A new cytokine release assay to monitor the immune status of HIV infected patients and sepsis patients Ines Kaufmann, Rika Draenert, Markus Gruber, Matthias Feuerecker, Brian Crucian, Satish Mehta, Julia Roider, Duane Pierson, Briegel Josef, Gustav Schelling, Clarence Sams, Alexander Choukèr

15:15  Vla-2 | Signal transduction in primary human T lymphocytes in altered gravity - results of the MASER-12 suborbital space flight mission Svantje Tauber, Swantje Hauschild, Claudia Crescio, Christian Secchi, Isabell Buttron, Antonella Pantaleo, Angela Saba, Katrin Paulsen, Cora S. Thiel, Augusto Cogoli, Proto Pippia, Oliver Ullrich

15:30  Vla-3 | Gene expression in human cells is sensitive to altered gravity a fundamental biological principle? Cora S. Thiel, Svantje Tauber, Katrin Paulsen, Oliver Ullrich

15:45  Vla-4 | Non pathogenic OP50 Escherichia coli has increased virulence during space flight and clinorotation. Timothy Hammond, Holly Birdsal, Jeffrey Hammond, Louis Stodieck, Paul Koenig, Jeanne Becker, Patricia Allen
16:00  **Vla-5 | Immune responses to the long-term spaceflight: Dynamics of innate and adaptive dysfunctional states**  
**Buqing Yi**, Igor Nichiporuk, Ines Kaufmann, Matthias Feuerecker, Claudia Streve, Manfred Thiel, Gustav Schelling, Marina Rykova, Boris V. Morukov, Alexander Choukèr, Alexander Choukèr

16:15  **Vla-6 | Online kinetic measurements on the Short-Arm Human Centrifuge: Hypergravity increases reactive oxygen species production in macrophages**  
**Sonja Brungs**, Melanie von der Wiesche, Waldemar Kolanus, Ruth Hemmersbach

15:00  **VIB - ARTIFICIAL GRAVITY**

15:00  **Vlb-1 | Design of a Compact Short Radius Centrifuge Artificial Gravity Test Platform**  
**Laurence Young**, Chris Trigg

15:15  **Vlb-2 | Effects of Short Arm Human Centrifuge induced Gravity and Hypergravity on the Human Microcirculation**  
**Helmut Habazettl**, Oliver Opatz, Andrea Nitsche, Hanns-Christian Gunga

15:30  **Vlb-3 | Effects of an artificial gravity countermeasure on orthostatic tolerance and aerobic capacity after short-term bedrest.**  
**Dag Linnarsson**, Gilles Clément, Bill Paloski, Jörn Rittweger, Floris Wuyts, Jochen Zange, Edwin Mulder, Lars Karlsson

15:45  **Vlb-4 | Effectiveness of an improved short arm centrifuge device for artificial gravity with ergometric exercise as a countermeasure for spaceflight deconditioning**  
**Satoshi Iwase**, Naoki Nishimura, Kunihiko Tanaka, Tadaaki Mano

16:00  **Vlb-5 | Centrifugation Training and Orthostatic Intolerance in One Hour 6-degree Head Down Tilted Men and Women**  
16:15  Vlb-6 | Next Steps in Artificial Gravity Research?
       William Paloski

15:00  VIC - TECHNOLOGY FOR HUMAN SPACEFLIGHT AND FUTURE PROBLEMS

15:00  Vlc-1 | Potential markets for application of space medicine achievements
       Oleg Orlov, Mark Belakovskiy, Anna Kussmaul

15:15  Vlc-2 | ANITA2, an Air Monitor System for Continuous In-Orbit Operation on the ISS
       Peter Hofmann, Timo Stuffler, Sven Gutruf, Dirk Kampf, Atle Honne, Norbert Henn

15:30  Vlc-3 | MODELING MUSCULOSKELETAL HUMANSUITSUIT INTERACTION
       Ana Diaz, Allison Anderson, Jeffrey Hoffman, Dava Newman

15:45  Vlc-4 | DEPLOYABLE AND PORTABLE EMERGENCY SHELTER FOR MARS
       Sandra Häuplik-Meusburger, Polina Petrova, Simon Evetts, Chan Sivanesan, Gernot Grömer

16:00  Vlc-5 | Performance Evaluation of Astronaut during Extravehicular Activity by Using Hybrid Dynamical System Based Simulation
       Li Hao, Wang Chunhui, Chen Shanguang

16:15  Vlc-6 | Effects of simulated weightlessness on the intestinal mucosal barrier functions of rats
       Mingliang Jin, Peng Shang

17:00  PLENARY SESSION 4 - PERSONALIZED MEDICINE: ASTRONAUTS AS ROLE MODELS

17:00  Plenary Session 4-1 | CROWDSOURCING: AN APPROACH TO IMPROVING SPACE MEDICAL CARE SYSTEMS
       Jeffrey Davis
17:15  **Plenary Session 4-2 | The Lifetime Surveillance of Astronaut Health (LSAH) Project**  
**Genie Bopp**, Mary Wear, Lesley Lee, Mary van Baalen

17:30  **Plenary Session 4-3 | The personal space workout – transfer of physical exercise training concepts from earth to space**  
**Nora Petersen**, André Rosenberger, Patrick Jaekel

17:45  **Plenary Session 4-4 | Unexpected Low Bone Mineral Density in Young, Healthy Males**  
**Mehdi Kordi**, Oliver Angerer, Gabi Armbrecht, Marie-Pierre Bareille, Arnaud Beck, Daniel L. Belavý, Volker Damann, Simon Evetts, Dieter Felsenberg, Alexandra Noppe, Melanie von der Wiesche

18:00  **Plenary Session 4-5 | Personalized Medicine: The Unique Challenges within the International Space Community to Implement Requirements**  
**Frits de Jong**, Jennifer Struble

18:15  **Plenary Session 4-6 | From space medicine to preventive and personalized health care on Earth**  
**Filippo Ongaro**, Filippo Ongaro
08:30 **VIIA - SLEEP AND PERFORMANCE**

08:30 **VIla-1 | SLEEP RISKS IN SPACE: EFFECTS OF COGNITIVE WORKLOAD ON SLEEP PHYSIOLOGY UNDER SLEEP RESTRICTED AND NO SLEEP RESTRICTED CONDITIONS**
Takashi Abe, Namni Goel, David F. Dinges

08:45 **VIla-2 | FATIGUE RISKS IN SPACE: NEUROBEHAVIORAL AND PHYSIOLOGICAL EFFECTS OF HIGH COGNITIVE WORKLOAD AND CHRONIC SLEEP RESTRICTION**
Namni Goel, Marcia Braun, David F. Dinges

09:00 **VIla-3 | Measuring cognitive performance in space: validity of a 3-min PVT administered on a handheld computer**
Eva-Maria Elmenhorst, Hans Jürgen Hörmann, Katharina Oeltze, Sibylle Pennig, Martin Vejvoda, Juergen Wenzel

09:15 **VIla-4 | Cognitive side-effects of candidate drugs against space motion-sickness: a double-blind, placebo controlled study.**
Aurelie Weerts, Nathalie Pattyn, Paul van de Heyning, Floris Wuyts

09:30 **VIla-5 | MONITORING OF SLEEPINESS-RELATED FATIGUE IN SPACE FLIGHT WITH OPTICAL COMPUTER RECOGNITION**
David F. Dinges, Christopher W. Jones, Mathias Basner, Xiang Yu, Fei Yang, Namni Goel, Takashi Abe, Dimitris N. Metaxas

08:30 **VIIB - MARS500 - PART 1**

08:30 **VIib-1 | "MARS-500" project: the main results. Prospects of the results use.**
Boris V. Morukov, Mark Belakovskiy, Eugenii Demin, Galina Vassilieva

08:45 **VIib-2 | Effect of varied physical exercises on skeletal muscles in the Mars500 simulation experiment.**
Elena Fomina, Nataliya Lysova, Alexander Meigal
09:00 VIIb-3 | Microbial ecology of confined habitats and human health (MICHA) a MARS 500 experiment
Petra Schwendner, Simon Barczyk, Francesco Canganella, Reinhard Rachel, Harald Huber, Reinhard Wirth, Petra Rettberg

09:15 VIIb-4 | Neuroendocrine and metabolic effects of long-term space-like confinement stress
Felice Strollo, Paolo Magni, Monica Monici, Daniela Santucci, Iarba Carucci, Massimiliano Ruscica, Galina Vassilieva, Igor Nichiporuk, Fabio Celotti, Maria Angela Masini

09:30 VIIb-5 | The longitude medical-environmental investigations in "Mars-500" project: lessons learned and future outlook.
Anna Chernikova, Roman Baevsky, Azaliya Berseneva

09:45 VIIb-6 | MARS520: Ambulatory Blood Pressure Monitoring during Long-Term Confinement

10:30 VIIIa-1 | The International Analog Research Working Group
Lauren Leveton, Alexandra Whitmire, Diana Arias, Oliver Angerer

10:30 VIIIa-2 | Update On ESA Ground-based Analogue Activities
Oliver Angerer, Jennifer Ngo-Anh, Martin Zell

10:45 VIIIa-3 | Applications and limitations of simulation experiments in gravitational biology
Ruth Hemmersbach, Jens Hauslage, Kai Waßer, Sascha Hoppe, Sonja Brungs, Lars Krause, Peter Eiermann, Markus Braun, Daniela Grimm, Kathrin Schoppmann, Christian Laforsch, Oliver Ullrich, Krassimira Ivanova, Ralf Anken
11:15  VIIIa-4 | INTERNATIONAL SPACE STATION AND GROUND-BASED ANALOGUES: MAIN RESEARCH DIRECTIONS FOR PREPARATION OF FUTURE MISSIONS
Albert Nechaev

11:30  VIIIa-5 | LUNAR HABITAT SIMULATION
Ola Eiken, Adam C. McDonnell, Michail E. Keramidas, Roger Kolegard, Britta Lind, Igor B. Mekjavic

11:45  VIIIa-6 | In vivo retinal images for a non-invasive analysis of the microcirculation during hypoxia and unloading/inactivity
Patrick de Boever, Tijs Louwies, Stylianos Kounalakis, Polona Jaki Mekjavic, Ola Eiken, Igor B. Mekjavic

10:30  VIIIb - CELLULAR AND MOLECULAR RESEARCH

10:30  VIIIb-1 | Melanocytes: interface of cell biology and pathology with a focus on response to gravity alterations
Krassimira Ivanova, Peter Eiermann, NN, Rupert Gerzer

10:45  VIIIb-2 | Alteration of signaling pathways along MMSC commitment at simulated microgravity
Ludmila Buravkova, Pavel Gershovich, Julia Gershovich, Anatoly Grigoriev

11:00  VIIIb-3 | Response and Adaption of Bone Cells to Simulated Microgravity
Ai-Rong Qian, Li-Fang Hu, Xiang Gao, Rui Meng, Sheng-Meng Di, Peng Shang

11:15  VIIIb-4 | miR-214 is an important therapeutic target in counteracting hindlimb unloading induced osteoporosis in mice
Li Yingxian, Li Qi, Wang Xiaogang, Li Yuheng, Zhang Pengfei, Li Yinghui

11:30  VIIIb-5 | Mechanisms inducing three-dimensional growth of endothelial cells
Daniela Grimm, Ma Xiao, Markus Wehland, Jessica Pietsch, Norbert Hübner, Kathrin Saar, Herbert Schulz, Johann Bauer
11:45  VIIIb-6 | Formation of Multicellular Tumor Spheroids under Simulated Microgravity on a Random Positioning Machine
Jirka Grosse, Markus Wehland, Jessica Pietsch, Johann Bauer, Ruth Hemmersbach, Daniela Grimm

13:00  IXA - MARS500 - PART 2

13:00  IXa-1 | Behavioral and Psychosocial Changes During a 520-day Simulated Mission to Mars
Mathias Basner, David F. Dinges, Daniel J. Mollicone, Igor Savelev, Adrian Ecker, Adrian Diantonio, Christopher W. Jones, Eric C. Hyder, Kevin Kan, Boris V. Morukov, Jeffrey P. Sutton

13:15  IXa-2 | Assessing group dynamics by individual radio satellites in the Mars-500 project
Bernd Johannes, Alexej Sitev, Alla Vinokhodova, Vyacheslav Salnitski, Eduard Savchenko, Anna Artyukhova, Yuri Bubeev

13:30  IXa-3 | Study of blood brain-specific proteins' dynamics in the conditions of 520-day isolation under the project «Mars-500»
Galina Vassilieva, Igor Nichiporuk, Boris V. Morukov

13:45  IXa-4 | Complementary approaches to assess the crewmembers' behavioral profiles during Mars-500 experiment
Carole Tafforin, Bernd Johannes

14:00  IXa-5 | Indirect Measures of Changes in Cognitive and Emotional States in Long-Term Isolation: Multilingual Content Analysis of Mars 500 Crew Communication
Bea Ehmann, Laszlo Balazs, Dmitry Shved, Vadim Gushin

14:15  IXa-6 | The Role of Communication for Psychological Crew Support during Human Exploration Mission Simulation Mars-500
Elena Feichtinger
13:00  IXB - PANEL ON VIIP RISK

13:00  IXb-1 | THE VISUAL IMPAIRMENT INTRACRANIAL PRESSURE SYNDROME IN LONG DURATION NASA ASTRONAUTS: AN INTEGRATED APPROACH
Christian Otto, Yael Barr, Stephen Hart, Mary van Baalen, William Tarver

13:15  IXb-2 | RUSSIAN COSMONAUTS VISUAL FUNCTION STUDY RESULTS
Valery Bogomolov, Mikhail Kuzmin, Sergei Danilichev

13:30  IXb-3 | Ophthalmic Changes among European Astronauts
Claudia Stern, Ulrich Straube, Goetz Kluge, Martin Trammer, Indra Chaudhuri-Hahn

Mark Shelhamer, John Carey, Kristen Janky, Maria Geraldine Zuniga

14:00  IXb-5 | Utilizing the :envihab for Visual Impairment and Intracranial Pressure (VIIP) Research
Karina Marshall-Bowman, Jörn Rittweger

John Charles, Jon McFather, Igor Savelev

13:00  IXC - HOW TO IMPLEMENT HUMAN RESEARCH EXPERIMENTS ON THE INTERNATIONAL SPACE STATION

Human Research on board the International Space Station – Workshop to discuss the life cycle of a human life sciences experiment implemented on the United States On-Orbit Segment

The workshop discusses all phases of a human life sciences experiment – from preparation of the proposal until the final science report after data collection is completed. The workshop is organized by ESA’s Human Research Unit, but the implementation process for all human life sciences experiments implemented under
USOS resources is similar between space agencies, thus the workshop should be of generic interest to all scientists with an interest in ISS research.

The purpose of this workshop is to provide insight for a better understanding of the implementation process and the entities involved and to increase awareness of the limitation of doing medical research on board the International Space Station.

With the next International Life Sciences Research Announcement (ISLRA) planned for the end of 2013, awareness of these processes and the critical resources should result in more feasible experiment proposals and faster implementation.

15:00 **PLENARY SESSION 5 - NHHPC AND :ENVIHAB REACH OUT TO FUTURE MARKETS**

15:00 **Plenary Session 5-1 | SIGNIFICANCE OF GROUND-BASED MODEL INVESTIGATIONS FOR IMPLEMENTATION OF LONG-TERM SPACE MISSIONS**
Anatoly Grigoriev, Anatoly Potapov

15:20 **Plenary Session 5-2 | For the plenary panel: "NHHPC and :envihab - reach out to future markets" - NASA Human Health and Performance Center (NHHPC) - Collaborative Projects**
Jeffrey Davis

15:40 **Plenary Session 5-3 | NASA Human Health and Performance Center (NHHPC): Collaborate|Innovate|Educate**
Elizabeth Richard

16:00 **Plenary Session 5-4 | Temos, an :envihab spinoff company**
Claudia Mika, Rupert Gerzer

16:15 **Plenary Session 5-5 | Seeding New Business Opportunities: NSBRI Industry Forum, Partners and Products**
Dorit Donoviel, Jeffrey P. Sutton
08:30 XA - TECHNOLOGY & HUMAN BEHAVIOUR

08:30 Xa-1 | AN OBJECTIVE UNOBTURUSIVE MODEL-BASED TRACKER OF FACIAL EXPRESSIONS OF EMOTIONS IN SPACE FLIGHT
David F. Dinges, Christopher W. Jones, Mathias Basner, Fei Yang, Namni Goel, Takashi Abe, Dimitris N. Metaxas

08:45 Xa-2 | Personality, Communication Processes and Team Effectiveness of Extended Duration Polar Patrol Teams: Applications for a Mars Mission
Gloria Leon, Anders Kjærgaard, Birgit Fink, Noah Venables

09:00 Xa-3 | Individualized Neurocognitive Assessment Toolkit for Spaceflight Fatigue (NeuroCATS)
Jason Schneiderman, Ruben Gur, David F. Dinges, Daniel J. Mollicone, Christopher Mott, Thom McCann, Zachary Roberts, Allison Mott, Adam Savitt, Mathias Basner

09:15 Xa-4 | Head-Down Tilt Body Positioning Impairs Brain Function and Cognitive Performance
Alexander Stahn, Misbah Hussain, Sophie Molnos, Martina Anna Maggioni, Oliver Opatz, Mathias Steinach, Hanns-Christian Gunga

08:30 XB - ASTROBIOLOGY

08:30 Xb-1 | Exploring the geology of Mars using humans and robots
Frances Westall

08:45 Xb-2 | Astrobiology on the ISS, a stepping stone toward space exploration
Gerda Horneck

09:00 Xb-3 | The acidophilic iron-sulfur bacterium Acidithio-bacillus ferrooxidans als model organism for Mars
Petra Rettberg, Anja Bauermeister, Guenther Reitz, Hans-Curt Flemming, Stefan Leuko
09:15  Xb-4 | EXPOSE - Three complementing Astrobiology Missions on the ISS
       Elke Rabbow, Rainer Willnecker, Guenther Reitz

09:30  Xb-5 | Photosynthesis  State of the Art of Planetary Simulation Experiments and Space Research
       Jean-Pierre de Vera, Andreas Lorek, David Wolter, Natalia Kozyrovska, Oleksii Burlak, Björn Huwe, Jasmin Joshi, Francisco Javier Sánchez Íñigo, Rosa de la Torre Noetzel

09:45  Xb-6 | EXPOSE-R2 Astrobiology on the ISS
       Mario Schweitzer, Carlos Pereira, Jan Dettmann, Rene Demets

10:30  PLENARY SESSION 6 - POSITION PAPER ON SPACE LIFE SCIENCES - PART 2