THE INTERNATIONAL SPACE STATION:
MAXIMIZING THE RETURN FROM EXTENDED OPERATIONS

Preliminary Program
15th ISU Annual International Symposium
Strasbourg, Tuesday 15th - Thursday 17th February 2011
**THE INTERNATIONAL SPACE STATION: MAXIMIZING THE RETURN FROM EXTENDED OPERATIONS**

**Scope of the Symposium**

In each academic year, the International Space University (ISU) organizes a three-day symposium as an interdisciplinary, international forum to help both the users and the providers of space-related systems to move forward from the discussion of problems to the formulation of innovative solutions. ISU has developed a winning formula for a «different kind of symposium»:

- Addressing all aspects of a topic - policy, business, legal, scientific, technical, etc.
- Creating ample time for discussion
- Fostering constructive dialogue among different sectors of the space community, or between different communities, that do not often interact in specialized symposia.

At each of the past several events we have attracted close to 200 participants from agencies, industry and academia in around 30 different countries. Each year we select a topical theme (the full list for of previous ones is at www.isunet.edu/symposium/past). ISU’s next symposium, the fifteenth in this series of annual events, will address the opportunities and possibilities offered by extending operation of the International Space Station (ISS) to at least 2020. A Closing Keynote will address possible future directions for human spaceflight beyond that time.

Following the announcement in April 2010 of the revised US plan for space exploration, and the continuing debate that this has sparked, these are clearly very timely subjects. The new US commitment to long-term ISS operation and utilization is, in many people’s view, a major event in human space flight that offers new and challenging opportunities for research and technology development, as well as commercial activity and international cooperation. By early 2011, revised plans and new initiatives for extended ISS utilization within NASA and among its international partners should be taking shape.

The proposed scope of the symposium includes not just the central theme of how to make best use of the extended ISS life but also related issues of commercialisation both in resupply and operation.

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**Symposium Structure**

Following the Welcome and Keynote Address, there will be six half-day sessions as outlined below.

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**Tuesday 15th February**

1. The ISS in the Context of Long-term Human Spaceflight Plans
2. Current Concepts and Approved Programs for ISS Utilization
   Evening: Poster Session and Reception

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**Wednesday 16th February**

3. New Prospects and Challenges for Extended ISS Life

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**Thursday 17th February**

5. Legal, Policy and Ethical Issues
6. Future Directions

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The six sessions will include a series of papers each allocated 15 minutes followed by 5 minutes for questions. At the end of each session we will highlight posters relevant to the session theme, and a 40 minute Panel Discussion will then provide further opportunities for questions and for interaction and comment by all participants.

The Poster Session will be held in conjunction with a Reception on the first evening; posters will then be prominently displayed throughout the next two days. All the sessions will be plenary and in English, and will take place in ISU’s Boeing Auditorium, with seating capacity for up to 250 participants.
**Tuesday**

**15th February 2011**

**Morning**

08:15 > Registration Opens

09:00 > Opening Remarks
- Michael Simpson, President, International Space University (ISU)
- John Farrow, ISU Resident Faculty and Chair of Symposium Organizing Team

Opening Keynote Address

**Session One**

**The ISS in the Context of Long-term Human Space Flight Plans**
Chair: Michael Simpson, ISU President

- “Positioning the International Space Station for the Coming Utilization Era”, Mark Uhran, Assistant Associate Administrator for ISS, NASA HQ, USA.
- “Extended Use of the JEM for Future Manned Space Flights”, Kuniaki Shiraki, Keisatoshi Kuraoka, Yusuke Matsumura, Naoki Sato and Shinobu Doi, JAXA, Japan.
- “Achievements, Plans and Long-term Perspectives of the European ISS Utilisation”, Olivier Minster, Patrik Sundblad, Eric Istasse, Christer Fuglesang, Josef Winter, Lina De Parolis and Martin Zell, ESA/ESTEC.
- “German Life and Physical Sciences on ISS - Accomplishments and Perspectives”, Günter Ruyters and Peter Preu, German Space Agency (DLR), Bonn, Germany.
- “Russian Activities and Plans for ISS”, Alexei Krasnov, Head of Human Spaceflight Programme Department, Roskosmos, Russia.
- “Human Space Exploration – ISS and Beyond: A Global Trans-Cultural Quest”, Gerhard Thiele, European Space Policy Institute (ESPI).

**Session 1 Panel Discussion**
Chair: Michael Simpson, ISU President
Panel Members: Speakers of Session One

**Lunch**

**Afternoon**

14:00 > Session Two
**Current Concepts and Approved Programs for ISS Utilization**
Chair:

- “Astrobiology on the ISS: Advancing our Understanding about Life in our Solar System and Beyond”, Gerda Homeck, DLR, Germany and Pascale Ehrenfreund, Space Policy Institute, GWU, USA.
- “ISS Payload Operations and Support – A Reality Check”, Tom Happenbrouwers, Remon Annes and Denis Van Hoof, Space Applications Services, Belgium.
- “Orion Program Status”, Scott Norris and Randy Sweet, Lockheed Martin Space Systems Company, Denver, USA.
- “Implementation of a Short-arm Human Centrifuge on the International Space Station”, Anna Grinberg, Till Eisenberg, and Achim Schwarzwälder, Astrium Space Transportation, Germany.
- “Dexterous Operations on ISS and Future Applications”, Andrew Keenan, Canadian Space Agency and David Read, NASA Johnson Space Center.
- “Materials Science Research Rack Onboard the International Space Station”, Natalie Frazier, Jacobs, ESTS Group, USA, Jimmie Johnson, NASA Marshall Space Flight Center, USA and Winfried Aicher, Astrium GmbH, Germany.

**Session 2 Panel Discussion**
Chair: Panel Members: Speakers of Session Two

**Wednesday**

**16th February 2011**

18:00 – 20:00 > Symposium Reception and Poster Session

**Morning**

09:00 > Invited Paper:

**Session Three**

**New Prospects and Challenges for Extending ISS Life**
Chair:

- “Reliability and Risk Analysis Ahead of the International Space Station Life Extension”, Fareed Hayek, NASA, USA.
THE ISS: MAXIMIZING THE RETURN FROM EXTENDED OPERATIONS

Session 3 Panel Discussion
Chair: Speakers of Session Three
Lunch

Afternoon
14:00 > Session Four
COMMERCIAL ASPECTS OF ISS EXTENDED OPERATIONS – NEW CONCEPTS & KEYS TO SUCCESS
Chair:
- “NanoRacks Contribution to the ISS National Laboratory: The Commercial Path”, Jeffrey Manber, NanoRacks, LLC
- “ISS Utilization Potential for 2011-2020 and Beyond”, Ray Askel, Texas Engineering Experiment Station, Jay Chabrow, Consultant and Roy Nakagawa, The Aerospace Corporation, USA.
- “Sustainable Industrial ISS Utilisation – a Paradigm Shift in Microgravity Research”, Claudia Philpot and Hartmut Ripken, DLR, Germany.

Plus 3 papers under discussion from ‘NewSpace’/Commercial enterprises.

Thursday
17th February 2011

Morning
09:00 > Invited Paper:

Session Five
LEGAL, POLICY AND ETHICAL ISSUES
Chair: Kai-Uwe Schrogl, Director, European Space Policy Institute (ESPI), Vienna
- “Political Evolution of the International Space Station: Prospects for Future Success”, Mariel John, Space Foundation, USA.
- “The Prospects for Future Transatlantic Cooperation in the International Space Station Program and in Space Exploration under the Obama Administration”, Ian Pryke, George Mason University, USA.
- “An Appraisal of International and European Cooperation within the Human Space Exploration Effort”, Lesley Jane Smith, Leuphana University and Riga Graduate School of Law and Carla Sharpe, South African Foundation for Space Development.
- “Opening up ISS Utilisation Opportunities to New Participants”, Andre Farand, Legal Affairs Department, ESA.
- “The Influence of Privatization of Space Activities on the Future of the ISS: a Legal, Political and Ethical Perspective”, Romain Loubeyre and Raphaël Buchard, Master 2 Space and Telecommunication Law, Paris-Sud 11, France.

Session 5 Panel Discussion
Chair: Kai-Uwe Schrogl, ESPI
Panel Members: Speakers of Session Five
Lunch

15th ISU Annual International Symposium
Afternoon
14:00 > Session Six
Future Directions
Chair: Mary Snitch, Director of NASA Programs, Lockheed Martin Corporation, USA

- “Using the ISS for Capacity Building in Developing Countries”, Etim Offiong, African Regional Center for Space Science and Technology Education, Nigeria.
- “Choices at Space Station End of Life”, Jim Burke, The Planetary Society, Kathleen Codere, Lockheed Martin, USA and Jim Dator, University of Hawaii, USA.
- “The ISS: Stepping Stone toward a Global Space Exploration Program”, Megan Ansdell and Pascale Ehrenfreund, Space Policy Institute, GWU and Chris McKay, NASA Ames Research Center, USA.
- “Results of the ESA Call for Ideas on the Use of the ISS for Future Human Exploration beyond LEO”, Sylvie Espinasse, Andrea Albalat and John McClean, ESA/ESTEC.
- “Martian Feeling – An ISS Simulation of a Round-Trip Journey to Mars”, Carmen Felix on behalf of members of ‘Mars Analog Path’ Team Project, ISU MSc’10.
- “US Concepts for Future Long-Duration Human Habitation and Operations in Free Space”, Harley Thronson, NASA Goddard Space Flight Center, Daniel Lester, University of Texas, Michael Gold, Bigelow Aerospace, Bernard Kutter, United Launch Alliance and Phillip Spampinato, ILC Dover, USA.
- “The Construction Plan and Application Perspective of the Chinese Space Station”, Jiang Guohua, China Astronaut Research and Training Center, Beijing, China.

Session 6 Panel Discussion
Chair: Mary Snitch, Lockheed Martin Corporation
Panel Members: Speakers of Session Six

Closing Keynote Address – Speaker TBC (end by 17.00)

Poster Papers
- “Hazards of Uncontrolled Reentry and Need and Techniques for Controlled Reentry”, Chirag Bhatnagar, Mitesh Panchal, Aeronautical Engineering Department, Sardar Vallabhbhai Patel Institute of Technology, Vasad, India.
- “The Influence of the Extension of the ISS on the Space Environmental Policy: a Legal and Political Perspective”, Maude Hasbi, Student in Master II Space and Telecommunication Law, Paris-Sud Xi, France.
- “Utilisation of the ISS for Biology and Exobiology Studies: ESA Experience and Future Plans”, Jason Hatton, Christer Fuglesang, Martin Zell and Patrik Sundblad, ESA/ESTEC.
- “Modest Manned Lunar Space Station - Logical Extension of the International Space Station”, Milos Krmelj, IAA Regional Secretary, Slovenia.
- “Robotic Components on the ISS ROKVISS and DEXHAND”, Klaus Landzettel and Maxime Chalon, DLR Oberpfaffenhofen, Germany.
- “Future Development of Training and Operational Protocols for Exploration Missions using ISS Lessons Learned”, Vinita Marwaha and Tahir Merali, ESA/ESAC.
- “Dexterous Manipulation in Microgravity in Parabolic Flights and on ISS”, Vladimir Pletser and Patrik Sundblad, ESA/ESTEC with Jean-Louis Thonnard and Philippe Lefevre, Université Catholique de Louvain, Belgium, Joe McIntyre, Université Pierre Descartes, Paris, Ronal Kassel, Qinetiq Space, Belgium and Massimo Penta, Arsalis, Belgium.
- “ESA Research on Growing from Solutions in Microgravity: The Protein Crystallisation Diagnostics Facility and Future Prospects with the Solution Crystallisation Diagnostics Facility”, Vladimir Pletser, Stefano Mazzoni and Olivier Minster, ESA/ESTEC with Lothar Potthast, Astrium, Germany.
- “Networking Mini-Satellites and International Space Station”, Pranay Puchakayala, Bharath, Soumya Batra and Alankrita Negam, Vellore Institute of Technology University, India.
- “ESA Experiments with the European Modular Cultivation System (EMCS)”, M. Schoonmade, HE Space, NL and C. Bril- louet ESA/ESTEC.
- “My-Astronaut.org: Vote for and Fund Suborbital Space Heroes”, Elizabeth Wallace, Gryphon Scientific, USA.
**Program Committee**

*Program Committee Chair*
**W. Peeters**, ISU Dean

- **A. Aldrin**, Director of Business Development and Advanced Programs, United Launch Alliance, USA.
- **A. Beretz**, President, University of Strasbourg.
- **Y. Cheng**, Manager, International Cooperation Department, China Space Foundation.
- **F. Culbertson**, Senior Vice President and Deputy General Manager, Human Space, Orbital, USA.
- **B. Feuerbacher**, President, International Astronautical Federation (IAF).
- **N. Hammond**, Vice President, Strategic Planning and Business Development, United Space Alliance, USA.
- **R. Hieb**, Vice President, Exploration & Science Lockheed Martin Information Systems & Global Services (IS&GS)-Civil, USA.
- **J. Hoffmann**, Professor of Aeronautics and Astronautics, MIT, USA.
- **A. Krasnov**, Head of Human Spaceflight Programme Department, Russian Federal Space Agency.
- **V. Lopota**, President, Energia Space Corporation, Russia.
- **G. Nield**, Associate Administrator for Commercial Space Transportation, FAA, USA.
- **S. Pace**, Director, Space Policy Unit, George Washington University, USA.
- **D. Parker**, Director of Science, UK Space Agency.
- **M. Perino**, Head of Advanced Exploration Programs, Infrastructures & Transportation Systems, Thales Alenia Space, Italy.
- **J. E. Petro**, Deputy Director, NASA Kennedy Space Center, USA.
- **F. Pohlemann**, Vice President Strategy and Market Development, Astrium GmbH, Germany.
- **E. Pulham**, Chief Executive Officer, Space Foundation, USA.
- **R. Ramachandran**, ISRO Technical Liaison Officer & Counsellor (Space), Paris Office.
- **T. Reiter**, Head of Space R&D, DLR, Germany.
- **C. Sallabarger**, Vice-President, Space Missions Group, MDA, Canada.
- **K-U. Schrögl**, Director, European Space Policy Institute, ESPI, Vienna.
- **B. Shaw**, Vice President and General Manager Space Exploration, Boeing Defense, Space & Security, USA.
- **B. Smutny**, Chief Executive Officer, OHB, Germany.
- **F. Spiero**, Manager for Human Spaceflight, CNES, France.
- **F. Svelto**, Head of Microgravity Division, Italian Space Agency, ASI.
- **R. Thirsk**, Canadian Space Agency.
- **K. Todome**, President, Japan Manned Space Systems Corporation, Japan.
- **M. Uhran**, Assistant Associate Administrator for ISS, NASA HQ, USA.
- **J-C. Worms**, Acting Head, Space Science Unit, European Space Foundation, ESF.
- **S. Yi**, Astronaut, KARI, South Korea.

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**Registration Form**

For your convenience, register online directly at www.isunet.edu

*Title (please circle): Dr. / Mr. / Ms.*

*First Name:
Surname:
Position:
Organization:
Fiscal ID / VAT Number (for European Companies):
*Postal Address:
Zip Code: *City:
*Country:
Tel: Fax:
E-Mail:

**Registration Fee**

I wish to register for the Symposium “The International Space Station: Maximizing the Return from Extended Operations” for the following fee:

Before the 21st January 2011: 600 € / US$ 800
After the 21st January 2011: 800 € / US$ 1050
Retired / Alumni: 400 € / US$ 500
Student*: 250 € / US$ 300

*If you register as a student, thank you for providing us with a copy of a valid student ID. You may send this proof of identification either by fax to the following number: +33 (0) 3 88 65 54 47 or by e-mail at symposium15@isu.isunet.edu

**Social Event**

A concert and a conference dinner are included in the registration fees for each of the participants of the Symposium. This social event will take place on by February 16th 2011. If you wish to bring a guest, an additional charge of € 20 / US$ 25 will be requested. Please, tick the relevant information:

Yes, I will attend the Social Event
No, I will not attend the Social Event
Yes, I will be accompanied

Do you have any special dietary needs (please circle): Vegetarian / Kosher / Halal

**Payment**

- Checks (in EUR or US$ only) made payable to “International Space University”.
- Bank transfer to the following account at Société Générale, 255 Route de Mittelhausbergen - BP 30005 - 67012 Strasbourg Cedex IBAN: FR76 30003 0236000150012211 59
- Please enclose a photocopy/transfer number with this registration.
- Credit card: I, the undersigned, authorize ISU to charge this credit card.

Type of credit card: VISA MasterCard American Express

Name as appears on credit card:
Credit card number:
Expiry date:
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Date: Signature:

Please return this form by fax to ISU at +33 (0) 3 88 65 54 47, or send the relevant information by e-mail to symposium15@isu.isunet.edu
Symposium Registration

Cancellations and Refunds
Cancellations shall be made in writing to ISU. Refunds will be made according to the following policy:
Notice of cancellation received before 23rd January 2011, refund will be made after deduction of 50 € for bank and administrative costs. No refund will be made for cancellation received after 23rd January 2011.

The registration fee covers:
- Access to all conference facilities during the Symposium.
- Transport to/from the city center.
- Welcome reception, lunches and refreshments over the three days.
- Symposium Dinner and Concert.
- Book of abstracts
- Access to all presented papers

Strasbourg And The Surrounding Region

There will be an opportunity to sample some of the delights of Strasbourg itself on the second evening when all participants are invited to join us at a short concert in a historic church before enjoying Alsatian cuisine at the Symposium Dinner. The city and its surroundings offer a wide range of attractions to suit all tastes throughout the year. Those who don’t already know the region (and those who do!) may well be tempted to extend their stay into the weekend to discover more of its character and charm. Take a look at the tourist office website (www.ot-strasbourg.fr) to find out more about the many historic and cultural opportunities on offer including the famous cathedral, the ‘European district’, where many international institutions are based, and many other interesting places to visit while you are here.

Accommodation

At www.isunet.edu/symposium/hotels you will find a table with the options we have taken in some Strasbourg hotels, where you will be able to book at special rates. Please, make sure to make your reservations before the booking deadlines. Further hotels are listed at the local tourist office website at www.ot-strasbourg.com.

Hotels Combined provides a price comparison system, and there is a 10% rebate on accommodation cost available to participants of the International Space University’s Symposium who book through one of their participating websites. You can find out more information from their conference support scheme pages. To take advantage of this, you will need to book through their list of hotels in Strasbourg at http://www.hotelscombined.com/City/Strasbourg.htm

Local Organizing Team

- John Farrow, ISU Resident Faculty and Chair of Symposium Organizing Team
- Nadia Repussard, Symposium Logistics Coordinator, ISU
- Caroline Schwob, Coordinator for External Relations and Development, ISU.
- Steve Brody, Vice-President, North American Operations, ISU.
- Jim Burke, The Planetary Society, USA.
- Gilles Clément, ISU Resident Faculty
- Ian Pryke, Senior Fellow, CAPR, GMU and Senior Program Officer, Space Studies Board, USA.
- Hideto Suzuki, ISU Resident Faculty/JAXA.
- Nikolai Tolyarenko, Director, ISU Master of Space Studies.
- Nicolas Walter, European Science Foundation, Strasbourg.
- Chris Welch, Principal Lecturer in Astronautics, Kingston University, UK.
- Vasilis Zervos, ISU Resident Faculty.

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The ISU Central Campus is located in the Parc d’Innovation at Illkirch-Graffenstaden, a town in the southern part of the Strasbourg Urban Community. It is 15-20 minutes from the center of Strasbourg by car, 30-35 minutes by public transport.

- From Entzheim International Airport, it is a 15-20 minute-drive by car/taxi. From the airport, a taxi will cost approximately 25-30 Euro (rates are higher at night and on weekends/holidays). There is a shuttle service from the airport to the tram stop Baggersee Illkirch. From there take tram A direction Illkirch to tram stop “Campus d’Illkirch”. The ticket bought at the airport (about 5 Euro) is valid for the complete journey (shuttle-tram). Then follow the directions given under “Public Transport”.

- By Car: from the center of Strasbourg, take the A35 (highway) southwards in the direction of Colmar. (See continuation of directions after “From the Airport”.)

- From the Airport, take the same highway (A35) northwards, direction Strasbourg. In both cases, take exit 5, Illkirch Baggersee. At the traffic lights, go straight ahead and continue straight on until you reach a roundabout (traffic circle). Take the 4th turning into the Parc d’Innovation. Continue on Blvd. S. Brant until you reach the next roundabout. Take the first right on the roundabout and you will see the new ISU campus on your right. Take the first turning to your right (the Holiday Inn will now be on your left), two more right turns and you are on the ISU car-park!

- By Public Transport, take the “A” tram from the railway station or from the city center, direction Illkirch, and get off at the Campus d’Illkirch station (the tram runs from 4:30 a.m. to 0:30 a.m., with one tram every four minutes at peak hours). Turn left and walk to the roundabout, cross over. The building on your left is the Pole API. Continue for about 15 meters on Blvd. S. Brant, cross the street to get to the pedestrian path adjacent to the new ISU campus which should be visible on your right.
ISU would like to thank its generous sponsors and partners (as of November 2010)