SUSTAINABILITY OF SPACE ACTIVITIES:
INTERNATIONAL ISSUES AND POTENTIAL SOLUTIONS

First Announcement and Call for Papers
16th ISU Annual International Symposium
Strasbourg, Tuesday 21st - Thursday 23rd February 2012
Call for Papers & Program Outline

Abstracts of around 300 words are now invited and must reach symposium6@isu.isunet.edu by 12th October clearly indicating the title, authors’ names, affiliations and contact addresses. Please also tell us for which session(s) you are submitting your contribution. We will let you know by 4th November if your contribution has been selected for presentation in a session or as a poster. Further instructions will be provided to contributors when the preliminary program is issued in early December.

In addition to those presentations selected from the abstracts received, we will invite papers on key themes from an interdisciplinary and international perspective. These symposia attract an audience of around 200 members of the space sector from agencies, industry and academia worldwide. Our next symposium, the sixteenth in a series, will address the risks faced by spacecraft and crew due to various natural and human generated threats. Looking beyond the current ‘situation we ask what can be done to mitigate the threats in order to assure long-term sustainability of space activities particularly through increased cooperation between nations.

Scope of the Symposium

Each year, the International Space University (ISU) organizes a three day symposium addressing a topical theme from an interdisciplinary and international perspective. These symposia attract an audience of around 200 members of the space sector from agencies, industry and academia worldwide. Our next symposium, the sixteenth in a series, will address the risks faced by spacecraft and crew due to various natural and human generated threats. Looking beyond the current situation we ask what can be done to mitigate the threats in order to assure long-term sustainability of space activities particularly through increased cooperation between nations.

Six half-day sessions will address the major themes as listed here:
1. International Perspectives on Space Sustainability
2. Space Debris
3. Space Weather
4. Other Threats to Space Activities
5. Cooperative Approaches to Improved Space Sustainability
6. Looking Forward and Outward

English will be the working language each speaker having 15 mins to present followed by 5 mins for brief questions and answers. At the end of each session a Panel Discussion will provide further opportunities for questions and for interactions by participants.

A Poster Session will be held on the first evening in conjunction with the Symposium Reception and posters will then be displayed prominently throughout the following two days.

All sessions will be held in plenary and will take place in ISU’s Boeing Auditorium which has seating capacity for up to 250 participants.

Further details are provided below and at right in the form of lists of suggested topics in each session.

- Lessons from in-orbit collisions
- Guidelines and standards for reducing sources of debris
- Reducing spacecraft vulnerability by protective measures
- Laboratory investigations of impacts
- Collision warning and avoidance
- Orbit debris removal techniques
- Threats to astronaut safety and emergency rescue
- Risks for humans and property due to re-entry
- Economic impacts (insurance, asset value, damage assessment, cost of mitigating the threats)

We propose to leave until Session 5 the assessments of particular proposed Space Situational Awareness (SSA) approaches since they cover more than just debris.

**Session 1: International Perspectives on Space Sustainability**

The majority of papers in this session are likely to be invited from experts representing agency programs and/or international organizations. Abstracts are still welcome though at a level appropriate to a ‘overview’ session setting the broad perspective on space sustainability. Presently we expect to invite speakers from leading space agencies as well as from international bodies and foundations (e.g. UN COPUOS Working Group, IADC, etc).

**Session 2: Space Debris**

In this session we highlight technical and business issues associated with space debris threats including:
- Ground and space observations to monitor debris
- Spatial and temporal distributions
- Modeling, prediction, risk analysis

**Session 3: Space Weather**

This session is focused on monitoring of space weather effects and assessment of the hazards they pose for spacecraft operations. That still leaves a long list of areas where abstracts are welcome including many of the same areas that appear above for orbit debris, e.g. monitoring of effects by ground and space-based observations, modeling, protective measures, warning of impending events, threats to astronaut safety, and economic impacts.

**Session 4: Other Threats to Space Activities**

The ‘other’ here relates to various threats that don’t neatly fit in the previous sessions on orbit debris and space weather. One such area is ‘weaponization’ of space and potential anti-satellite (A-SAT) attacks on in-orbit assets by ground-based systems using ‘kinetic-kill’ or directed energy techniques. In this session we also invite papers addressing topics such as:
- Radio frequency interference (spectrum crowding, frequency management, jamming, etc)
- Vulnerability of ground stations and space activities dependent on them, including cyber-threats
- Limits on access to space especially for emerging nations

**Session 5: Cooperative Approaches to Improved Space Sustainability**

This session will address existing and proposed ways of improving the sustainability of space activities through associated policies and regulatory approaches. Since space is a ‘global commons’ this clearly calls for close cooperation between nations, hopefully leading in due course to international agreement at various levels ranging from adherence to guidelines for acceptable practices, through codes of conduct, to treaties. We include here discussion of SSA systems as essential means of gathering – and sharing – information required to protect space infra-structures against space debris, space weather and other potential threats. Abstracts relating to Space Traffic Management (STM) to reduce the probability of impacts or to minimize frequency interference are also invited.

It may also be appropriate here to ask what might be learned and carried over from successful models of international cooperation in related areas, e.g. in space science (ISTP etc), communications (ITU), Civil aviation (ICAO) or meteorology (WMO).

**Session 6: Looking Forward and Outward**

Here we look beyond near-term projections to consider new threats or cooperative opportunities as we move further into the future or further away from Earth including problems and counter-measures for:
- new entrants to the space arena
- new ventures such as commercial constellations, nanosat swarms, or massive in-orbit construction for solar power or solar radiation management schemes
- possible lower solar activity levels
- worst-case scenarios such as the Kessler Syndrome (imagine a decade rather than ‘a day without space!’)
- or, on a brighter note, if we are to achieve ISU’s goal of expanding human presence and activity beyond Earth orbit, what new sustainability issues does that introduce for protecting planetary environments, libration point orbits, etc?

**Wrap-up: (End at 1700)**

**Key Dates**
- **Call for Papers** - Friday 22nd July 2011
- **Deadline for Abstracts** - Wednesday 12th October 2011
- **Notification to Authors** - Friday 4th November 2011
- **Preliminary Program Issued** - Friday 9th December 2011
- **Early Registration Deadline** - Friday 20th January 2012
- **ISU 16th Symposium** - Tues 21st to Thurs 23rd February 2012
Registration Fee (Preliminary)

Before the deadline of 20th January 2012, the early-bird registration fee will be 600 € with reductions for students and ISU alumni. Details will follow in the Preliminary Program in early December 2011.

The fee includes:
• 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.

Accommodation
ISU has negotiated preferential rates and will make block bookings at a number of local hotels as listed at our Web site. For a complete list of Strasbourg hotels, contact the local tourist office: Tel: +33 (0) 3 88 52 28 28 Fax: +33 (0) 3 88 52 28 29

Updated Symposium information will appear in the coming months at http://www.isunet.edu/ or e-mail the Organizing Team directly at: symposium16@isu.isunet.edu

Strasbourg and its Surroundings

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 surrounding region offer a 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.

Historic and cultural opportunities on offer in Strasbourg are well described at the website http://www.ot-strasbourg.fr/. There you will find information on the famous cathedral, the ‘European district’, where many international institutions are based, and many other interesting places to visit while you are here.

ISU Location

The ISU Central Campus is located in the Parc d’Innovation at Illkirch-Graffenstaden in the southern part of Strasbourg Urban Community about 30 minutes from the city center by public transport. Full details of how to get to ISU appear at http://www.isunet.edu/.

Program Committee

Chair of Program Committee
• Walter Peeters,
  ISU Dean

The Program Committee is being established presently.

Symposium Organizing Team
• John Farrow,
  ISU Resident Faculty and Chair of Symposium Organizing Team
• Nadia Repussard,
  Symposium Logistics Coordinator
• Caroline Schwoeb,
  Coordinator for External Relations and Development, ISU
• Steve Brody,
  Vice-President, ISU North American Operations
• Jim Burke,
  The Planetary Society
• Ian Pryke,
  Senior Fellow, CAPR, GMU and Senior Program Officer, Space Studies Board, USA.
• Hideto Suzuki,
  ISU Resident Faculty/JAXA
• Chris Welch,
  Director, ISU MSc Programs
• Ray Williamson,
  Executive Director, Secure World Foundation
• Vasilis Zervos,
  ISU Resident Faculty

International Space University
Strasbourg Central Campus
1, rue Jean-Dominique Cassini
Parc d’Innovation
67400 Illkirch-Graffenstaden
France
Phone: 00 33 3 88 65 54 30
Fax: 00 33 3 88 65 54 47