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Paper Session II-A - International Space University (ISU)

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Abstract

The evolution of world's space programs requires new skills to be developed and enhanced in space community.Clearly, specialist knowledge alone is no longer sufficient.To manage the engineering, economic, political and organisational aspects of programs, space professionals need a very broad base of knowledge.

The originality of ISU's programs lies not only in their disciplinary diversity but also in the way this variety is integrated into coherent structured whole.At ISU, all students study all space related disciplines, vastly broadening their vision and enabling them to understand the complex interactions between disciplines.

By approaching the utilization of space from global rather then national perspective, ISU gives its graduates a powerful, competitive edge and profession.They become capable of understanding and easily crossing the traditional barriers arising between individuals from different nations, with different cultural backgrounds.

They will break new grounds in international cooperation on space programs.
Such capacities are developed at ISU through multidisciplinary curricula delivered in trully international, multicultural environment.

ISU Faculty comes to ISU from research and academic organisations, from space agencies, and space industries and non technical organisations.They are experts in both technical and non technical fields relevant to Space-sciences, technology, business, the humanities etc...

Introduction

Since its creation in 1987, the International Space University (ISU), has been multidisciplinary and international institution preparing individuals to respond to current needs, and the increasing and evolving demands to space sector in rapidly changing world.ISU considers space activities not as isloated actions undertaken by narrow community, but as a global undertaking of human race in which diverse and different systems and technologies flourish.So, because of that reason it calls for non-traditional approach to the education of space professionals.

ISU as institution

International Space University is institution founded on the vision of peacefull, prosperious and boundles future through the study, exploration and development of Space for the benefit of all human race.

ISU is institution dedicated to international cooperation, collaboration and openly scholarly pursuits related to outer space exploration and development.It is the place where students and faculty from all backgrounds are welcomed; where diversity of culture, philosophy, lifestyle, training and opinion are honored and nurtured.

ISU is institution which recognizes the importance of interdisciplinary studies for the successfull exploration and development of space.ISU strives to promote an understanding and appriciation of Cosmos thorough the constant evolution of new programs and curriculia in relevant areas of study.To this end ISU will be augmented by expanding base of campus facilities and affiliations both on and off Earth.

ISU is institution dedicated to the development of human species, the preservation of its home planet, the increase of knowledge, the rational utilization of vast resources of Cosmos and sanctity of Life in all terrestrial and extraterrestrial manfiestations. ISU is place where students and scholars seek to understand the mysteries of Cosmos and apply their knowledge to betterment of human condition.It is objective of ISU to be integral part of Humanity's movement into Cosmos and to carry forth all the priciples and philosophies as already mentioned.

Paving the way to effective cooperation in space

International Space University (ISU) is an institution for higher education, professional development and research for interdisciplinary study of all space related disicplines. Today's challenges in the space arena require leaders and innovators capable of global vision space activities and able to work in an international contex integrating diverse cultural backgrounds and using different problem -solving approaches. ISU meets the challenge by offering programs covering all aspects of space related discplines and their interactions through interdiscplinary, international and intercultural instructions delivered by experienced faculty members and over 500 guest lecturers who have been coming to ISU from industry, governmental agencies, universities and research institutions worldwide since 1988.

At present time, ISU offers three programs to postgraduates and professionals: an intensive ten-week Summer Session Program, an very intensive and demanding eleven-month postgraduate degree course, the Master of Space Studies, and a Professional Development Program comprising short courses and workshops for working professionals, helping them to improve skills and performance in their careers.

ISU educational and training program cover all disciplines relevant to space programs and their applications, with a strong emphasis on interdisciplinary studies.While students are provided with necessary fundamental knowledge in all disciplines studied, both technical and non-technical, it is the study of the interactions between all these disciplines and the global perspective thus acquired which make ISU programs unique. Skills in communications, teamworking and research, and in problem-solving and decision-making in multicultural contexts are specifically developed to prepare students for work in an international environment. Experience in using these skills is acquired through work on collaborative team project to produce the complete conceptual design of an international space program and covering all aspects of it-technical, financial, organisational, political, legal, etc. These projects are a very important component of both Summer Session Program and Master of Space Studies. They result in published reports which serve, as whole or in part, as resource

material for use by world space community when similar studies are undertaken, or even to initiate these studies.

ISU Summer Session and Master of Space Studies also include theme days, seminars and workshops which bring together international experts from industry, government and academia to discuss contemporary and future isuess and developments in space arena. Specialized lectures, requiring an appropriate level of competence, provide more in- in depth study in specific fields. Visit to industry, research establishments and other centers of professionals interest offer opportunities for first-hand observation of space applications and hardware.
All these elements are adapted in different ways to fit the structure and time.frame of each program.

Some of studied disciplines:

- Business and Management of space programs
- Command, Control and Communicationss Systems
- Earth Observation (Remote Sensing, Geographical Information Systems)
- Earth-oriented Space Applications (telecommunications, Global Positioning Systems, Global Navigation Systems)
- Launch Vehicles and Transportation Systems
- Law and Policy of space activities
- Mission Analysis and System Architecture
- Orbital Systems
- Space and Society (education, ethics, history, philosophy,...)
- Space Architecture
- Space Life Sciences
- Space Physical Sciences
- Space Resources and Processing under Microgravity

ISU Summer Sessions

Since the first Summer Session, which took place at the Massachusetts Institute of Technology in 1988, ISU has proved valuable experience for over 1200 young professionals and postgraduate students from many nations.The ISU Summer Session is intensive ten week program during which students participate in outstanding educational experience. In addition to the elements mentioned above, the curriculum includes workshops to develop skills in specific areas, with hands-on experience and case-studies when appropriate. Students are asked to paarticipate in one of the two Design Projects of topical significance which are proposed for collaborative team work.

The ISU Summer Session has proved to be exceptional opportunity for students and faculty to network with professional collegues and international leaders in space research, development and applications.The interactive international environment provides all participants with numerous opportunities to forge new professional relationships. Over years, Summer Sessions alumni, faculty members, visiting lecturers aand members of host community have

contributed to creating a professional network faciltitating acess to information and exchanges which have been successfull in advancing various projects.

Master of Space Studies (MSS)

The Master of Space Studies (MSS) program welcomed its first class of students in Strasbourg in September 1995. It is eleven-month program which takes place in Strasbourg Central Campus apart from twelve -week professional placement period at an ISU Affiliate, another institution, space agency or industry, in different parts of the world. As from September 1997, the program will be offered in modules, which may be either taken in one academic year, or built up over two or a maximum of three years.

Training in computer and modern electronic information systems and English and French language skills, 12 weeks of professional placement, and regular individual guidance from Academic Adviser are particular features of this program.

Individual Project

The academic advisors also help each student to chose Indivudal Project.The aim of this academic activity is to enable students to pursue original work in their main field of interest while making significant contribution to a project in their host institution during their professional placement period.

Team Project

The Team Project develops teamwork skills in multionational environment and is an opportunity to propose innovative solutions to current problems.The Annual International Symposium, focusing on the same topic as Team Project, is an important opportunity for MSS students to develop professional networking contacts.

Professional Development Program (PDP)

In response to requests, from industry in particular, ISU began its Professional Development Program (PDP) in April 1996.These courses target the senior and middle management groups and emphasize the interdisciplinary, international and intercultural aspects of chosen themes.

Affiliates

The affiliates constitute an important element of the ISU network, working on the elaboration of present and future ISU programs, including research projects.This network of 25 institutions in 14 countries is further enhanced by the Summer Session host institutions which become extremely important partners thorough the 18 months or more preparatory activity during the session itself.Summer Session host institutions make essential contributions to academic vitality of ISU, as do other institutions worldwide which host MSS students for their professional placement period during the second module of MSS program.

ISU is independent from national and commercial interests and is therefore an ideal neutral forum for discussion on many space related issuess.The network of alumni, faculty, guest lecturers, institutions and professional contacts which characterizes the ISU Community makes it possible to bring together leading international specialists in an academic environment conducive to exchanges and to creation of innovative and visionary ideas. Multicultural perspectives become more readily accesible in such environment where the meeting of space -users and space-providers can lead to understanding necessary for defining objectives for mutual benefit.

International Annual Symposium

The first ISU International Annual Symposium on »Space of Service to Humanity«, held in Strasbourg Central Campus from 5-7 February 1996 was event of this nature.Attended by more then 130 participants from over 40 nations, it was successfull beginning to ISU activity in this field.The topic of 1997 Symposium was on »New Space Markets«.The theme for 1998 was titled » 21st Century Space based Tele-services«.

The the theme for 1999 ISU Annual Symposium has title:« International Space Station: The Next Marketplace«.In 2000 the theme was:« The Space Transporation Market:Evolution or Reevolution? In 2001 theme was:« Smaller Satellites:Bigger Business?« And 2002 theme was:« Beyond the International Space Station:the Future of Human Spaceflight«.
For 2003, the topic will be »Future Space Navigation Systerms«.

References:

1. Haskell, G. and Rycroft M. (ed.): *Space of Service to Humanity:Preserving Earth and Improving Life: Symposium Proceedings, 5-7 February 1996, Strasbourg, France* (Space Studies Series, Vol. 1).Kluwer Academic Publishers, Dordrecht, 1997.

2. Haskell, G. and Rycroft M. (ed.): *New Space Markets: International Symposium, 26- 28 May 1997, Strasbourg, France* (Space Studies Series Vol.2).Kluwer Academic Publishers, Dordrecht, 1998.

3. Haskell, G. and Rycroft, M (ed.): *Space and Global Village; Tele-services for 21 st Century*: *Third International Symposium, 3-5 June 1998, Strasbourg, France* (Space Studies Series Vol. 3). Kluwer Academic Publishers, Dordrecht, 1999.

4. M.Rycroft (ed.): *The Space Transporation Market:Evolution or Revolution? Proceedings of* International Symposium, *24-26 May 2000, Strasbourg, France* (Space Studies Series Vol.5). Kluwer Academic Publishers, Dordrecht, 2000.

5. M. Rycroft (ed.): *Beyond The International Space Station:The Future of Human Spaceflight. Proceedings of an International Symposium, 4-7 June 2002, Strasbourg, France* (Space Studies Series Vol. 7).Kluwer Academic Publishers, Dordrecht 2002.

6. *SSP Design Project Reports:*

1.) International Lunar Initiative	SSP 1988
2.) Artemis:An International Lunar Polar Orbiter	SSP 1989/A
3.) Newton:Variable Gravity Research Facility	SSP 1989/B
4.) International Asteroid Mission	SSP 1990/A
5.) International Program for Earth Observation (ILEO)	SSP 1990/B
6.) International Mars Mission	SSP 1991
7.) ISUnet	SSP 1992/A
8.) Space Solar Power Program	SSP 1992/B
9.) Global Emergency Observation and Warning (GEOWARN)	SSP 1993/A
10.) International Lunar Farside Observatory (ILFOS)	SSP 1993/B
11.) Global Acess Tele-health and Education System (GATES)	SSP 1993/A
12.) Solar System Exploration Program	SSP 1994/B
13.) Earth's Polar Regions: Observation, Protection, and Application	SSP 1995 /A
14.) Vision 20/20	SSP 1995/B
15.) Distant Operations Care Center (DOCC)	SSP 1996/A
16.) Ra:The Sun for Science and Humanity	SSP 1996/B
17.) Technology Transfer: Bridging Space and Society	SSP 1997/A
18.) International Strategies for the Exploration of Mars	SSP 1997/B
19.) Hazard to Spaceflight	SSP 1998/A
20.) Microgravity-A Generatoor for	SSP 1998/B

International Cooperation (MGIC)

21.) South East Asia Disaster Management System (SEADS)	SSP 1999/A
22.) Out of the Cradle-An International Strategy for Human Exploration Away From Earth	SSP1999/B
23.) El Nino and Southern Osciallarion: A Global Challenge and Keys to Solution	SSP 2000/A
24.) Space Tourism:From Dream to Reality	SSP 2000/B
25.) Commercial Acess and Space Habitation (CASH)	SSP 2001/A
26.) Concepts for Advanced Small Satellite to Improve Observation and Preservation of Europe's Environment (CASSIOPEE)	SSP 2001/B
27.) Astrobiology	SSP 2002 /A
28.) Enhancing Human Health with Space Technology	SSP 2002 /B

In 2003, the projects will develop the following themes:

- Climate Modelling using Space Assets
- Missions to the Moon via ISS

7. *MSS Team Project Reports:*

a.) Space Assisted Network Against Desertification (SAND)	MSS/1996
b.) Multimision Innovative Space Systems for Information Otimized Network (M.I.S.S.I.O.N.)	MSS/1997
c.) ThirdEye: an aircraft collision prevention teleservice	MSS/1998
d.) Open for Business:A new Approach to Commecialisation of ISS	MSS/1999
e.) Autonomous Lunar Transport Vehicle	MSS/2000
f.) Small Satellites:Bigger Business?	MSS/2001
g.) Space Enterntainment and Tourism: Dream, Reality, Virtual Reality	MSS/2002/ A
h.) International Measures for Earth Protection against Impact from Space	MSS/2002/ B
i.) Future Navigation Systems	MSS/2003/A
j.) Mission to Mars via the International Space Station	MSS/2003/B