Introduction to International Space University

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Contents

1. ISU Founding
2. ISU Educational philosophy
3. ISU What is ISU?
4. ISU Programs
5. ISU Milestones
6. ISU Research
7. ISU – What it means
1. ISU Founding

- ISU was founded in 1987 by Peter Diamandis, Todd Hawley and Robert D Richards.

- In 1988, with the support of the major space agencies, the first ISU Summer Session Program (SSP, now Space Studies Program) took place at MIT.

- ISU believes in “a peaceful, prosperous and boundless future through the study, exploration and development of Space for the benefit of all humanity.”
2. ISU Educational Philosophy

- **ISU ‘3Is’:**
  - Three key aspects of ISU key to success in meeting the present and future challenges of international space cooperation:
    - Interdisciplinary
    - International
    - Intercultural

- **ISU disciplines**
  - 3Is Space
  - Space Engineering
  - Space Sciences
  - Human Performance in Space
  - Space Applications
  - Space Management and Business
  - Space Policy, Economics and Law
  - Space Humanities
3. What is ISU?

- **ISU is:**
  - A diverse student body learning from an experienced *international* faculty to gain an *interdisciplinary* understanding of space in an *intercultural* learning environment
  - A focus for excellence in space education for a changing world
  - A source of competitive edge for careers in space-related fields (nearly 75% of ISU alumni work in the space sector)
  - An international network of leading space experts and professionals
4. ISU Programs

**ISU Programs:**
- MSc in Space Studies (MSS)
- Space Studies Program (SSP)
- Southern Hemisphere Summer Space Program (SH-SSP)
- Executive Space Course (ESC)
- Commercial Space Studies Graduate Certificate (CSP)
- Space Resources Professional Course (SRPC)

**Programs delivered by:**
- Central campus faculty based at the Strasbourg HQ.
- Approximately 70 other ISU ‘global faculty’ plus adjunct and associate faculty.
- A wide range of visiting lecturers.
4.1 MSc in Space Studies (MSS)

- One- or two-year program for individuals seeking professional development or further academic study in the space field.

<table>
<thead>
<tr>
<th>M1-ITS Introduction to Space</th>
<th>M2-ISS Interdisciplinary Space Studies</th>
<th>Electives (3 ECTS each)</th>
<th>M3-TPR 31 Team Project</th>
<th>M5-INT Internship</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 ECTS</td>
<td>20 ECTS</td>
<td>15 ECTS</td>
<td>12 ECTS</td>
<td>12 ECTS</td>
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"Attending ISU has been, for me, the ultimate eye-opening experience. Attending the Master of Space Studies allowed me to pursue my personal interests with a limit determined only by my imagination. I found myself working on very exciting projects with talented and knowledge-thirsty colleagues."

Diego Urbina, MSS09

UNIGLO7 – Prof Chris Welch – 2019-12-01
Intro to ISU - 7
4.2 Space Studies Program (SSP)

- 9-week program for graduate students/professionals.
- Each year in a different location

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Phase I  
Core Lecture Series  
Mornings: Core Lectures
  Afternoons: Department Introduction Workshops

Phase II  
Departmental Activities  
Departmental Activities, Workshops, Theme Days
  Afternoons: Dept. Workshops/Activities

Phase III  
Team Project

Team Project Presentations
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“I find it hard to believe how much I’ve learned. Not only about space, but about people. It is an experience that cannot be described, only shared.”

Damian Hoffman
SSP10

UNIGLO7 – Prof Chris Welch – 2019-12-01
ISU SSP Host Sites 1988 - 2021

Europe
- 1989 Strasbourg (France)
- 1991 Toulouse (France)
- 1994 Barcelona (Spain)
- 1995 Stockholm (Sweden)
- 1996 Vienna (Austria)
- 2001 Bremen (Germany)
- 2003 Strasbourg (France)
- 2006 Strasbourg (France)
- 2008 Barcelona (Spain)
- 2010 Strasbourg (France)
- 2011 Graz (Austria)
- 2013 Strasbourg (France)
- 2016 Haifa (Israel)
- 2017 Cork (Ireland)
- 2018 Leiden (Holland)
- 2019 Strasbourg (France)
- 2021 Granada (Spain)

Asia
- 1992 Kitakyushu (Japan)
- 1999 Nakhon Ratchasima (Thailand)
- 2007 Beijing (China)
- 2020 Jiaxing (China)

North America
- 1988 Boston (USA)
- 1990 Toronto (Canada)
- 1993 Huntsville (USA)
- 1997 Houston (USA)
- 1998 Cleveland (USA)
- 2002 Pomona (USA)
- 2005 Vancouver (Canada)
- 2009 San Francisco (USA)
- 2012 Florida (USA)
- 2014 Montreal (Canada)
- 2015 Athens (USA)

South America
- 2000 Valparaiso (Chile)

Australia
- 2004 Adelaide (Australia)
4.3 Southern Hemisphere SSP

- **5-week program** for senior undergraduates, graduates and professionals.
- **Focuses on space applications, space policy and space services** while providing rounded coverage of other ISU subjects.
4.4 Commercial Space Studies Grad Cert

- Joint 6-week program with Florida Institute of Technology.
- Series of intensive courses focused on commercial space intended to supplement traditional engineering, entrepreneurial, and business, and education curricula.
- Emphasis on commercial space, technical and entrepreneurial management, and public-private partnerships.
4.5 Executive Space Course

- 4.5 day interdisciplinary introduction to space activities for participants from a range of professional backgrounds.

- Now offered in Strasbourg, Seattle and Canberra.
4.6 Space Resources Professional Course

- 2-day course with Colorado School of Mines and Luxembourg Space Agency.

- Overview of the space resources field, including:
  - Available resources
  - Identification
  - Collection
  - Extraction, processing, and utilization systems
  - Economic and technical feasibility studies
  - Legal and policy issues
  - Space exploration architectures and commercial ventures
5. ISU Milestones

- 1987 – ISU Founding Conference @ MIT
- 1988 – First Summer Session Program (now Space Studies Program) at MIT
- 1993 – Strasbourg, France, selected as ISU Central Campus
- 1995 – First Master of Space Studies class
- 2002 – Opening Ceremony for Central Campus
- 2003 – Launch of Executive Space Course
- 2011 – First Southern Hemisphere Summer – Space Program
- 2016 – New 15 years lease agreement in SXB
- 2016 – Launch of ESC-USA
- 2017 – First ISU experiments in space
- 2019 – Launch of ISU-FIT CSP
- 2019 – Launch of ESC-CBR
- 2019 – 25th Master of Space Studies class
- 2019 - 2020 – Refurbishment of building/incubators
6. ISU Research
6.1 SHEE Space Habitat Testbed

- FP7 project (EUR M1.3) which ran 2013-2017
- Aim: To develop a self-deployable autonomous architecture and technology test-bed for simulation of operations in extreme environments for analogue research.
6.2 Hydra ISS payloads
Hydra-1/Plant Growth Experiment

Launch: 5 December 2018 (CRS16)
Return: 15 January 2019 (CRS16)

Partners: Stanford University/Utah University, University of Strasbourg (NASA Ames)

Main objective: Observation of transgenic seed chemically-inducible protein expression in a microgravity environment.
Hydra-2/MMARS2

Launch: 29 June 2018 (CRS15)
Return: 15 January 2019 (CRS16)

Partners: University of Strasbourg, University of New South Wales, DLR

Main objective: Effect of space environment on methanogen growth.

Secondary objective: Measurement of radiation environment + effect of radiation on E coli DNA.
Hydra-3/Pulse

Launch: 29 June 2018 (CRS15)
Return: Early 2021 (tbd)

Partners: Studio Nahum, MacQuairie University

Main objective: Interactive space art payload

Secondary objective: Tech demonstration of radiation tolerant electronics + Orbital poetry.
6.3 Single Bubble Sonoluminescence

- Student team were selected for 2019 ESA Drop Your Thesis campaign at ZARM in Bremen.
7. ISU - What it means

The 4500+ ISU alumni come from over 105 countries

ISU is people – learning, acting, building our future in space.
Some ISU alumni

Rei Kawashima MSS96 SG UNISEC Global
Erika Wagner SSP01 Dir Payload Sales Blue Origin
Violetta Kuvaeva SSP06/MSS07 Senior Mgr Fleet Development SES
Soyeon Yi SSP09 Korean Astronaut

Naomi Kurahara SSP06 Co-Founder Infostellar
Chiara Manfletti MSS02 President Portuguese Space Agency
Jessica Meir MSS00 NASA Astronaut
Stephanie Bednarek SSP18 Dir Com Sales SpaceX
Abimbola Alale MSS01 MD NigComSat
Some more ISU alumni

Kyle Acierno (MSS15) VP Global Sales & Strat iSpace
Val Munsami (SSP09) CEO SANSA.
Yonatan Winetraub (SSP09) Cofounder SpaceIL
Robbie Schingler (MSS01) Cofounder Planet
Peter Platzer (MSS12) Cofounder/CEO Spire Global

Nahum (SSP16) Artist
Peter Martinez (SSP03) Exec Dir Secure World Foundation
James Newman (SSP89) NASA Astronaut
Juan de Dalmau (SSP89) President ISU
Li Ming (SSP91) Vice President China Academy of Spaceflight
Some NewSpace Companies with ISU alumni

- iSpace
- Virgin
- SpaceX
- ICEYE
- ORBIT
- Infostellar
- Spire
- Planet
- astrocast
- Blue Origin
- OneWeb
- ORBITFab
- World View
- Bryce
- Oxford Space Systems
- Open Cosmos
Any questions?

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