



Introduction to International Space University

Prof Chris Welch

chris.welch@isunet.edu

1 December 2019

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)

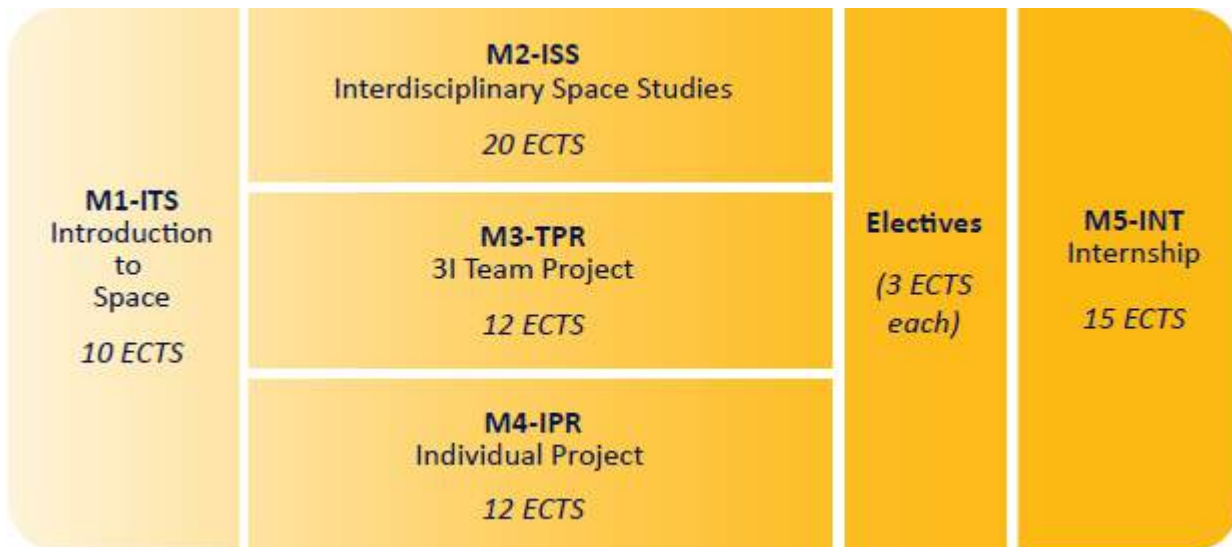
■ Programs delivered by:

- 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.



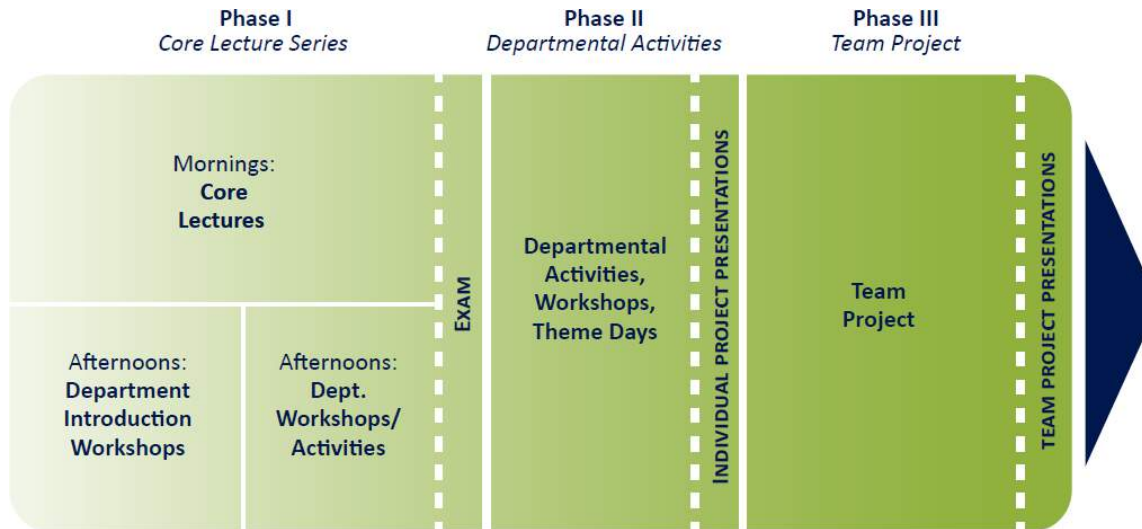
"Attending ISU has been, for me, the ultimate eye-opening experience. Attending the Master of Space Studies allowed me to pursue my personal interests with a limit determined only by my imagination. I found myself working on very exciting projects with talented and knowledge-thirsty colleagues"

Diego Urbina,
MSS09



4.2 Space Studies Program (SSP)

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



"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



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

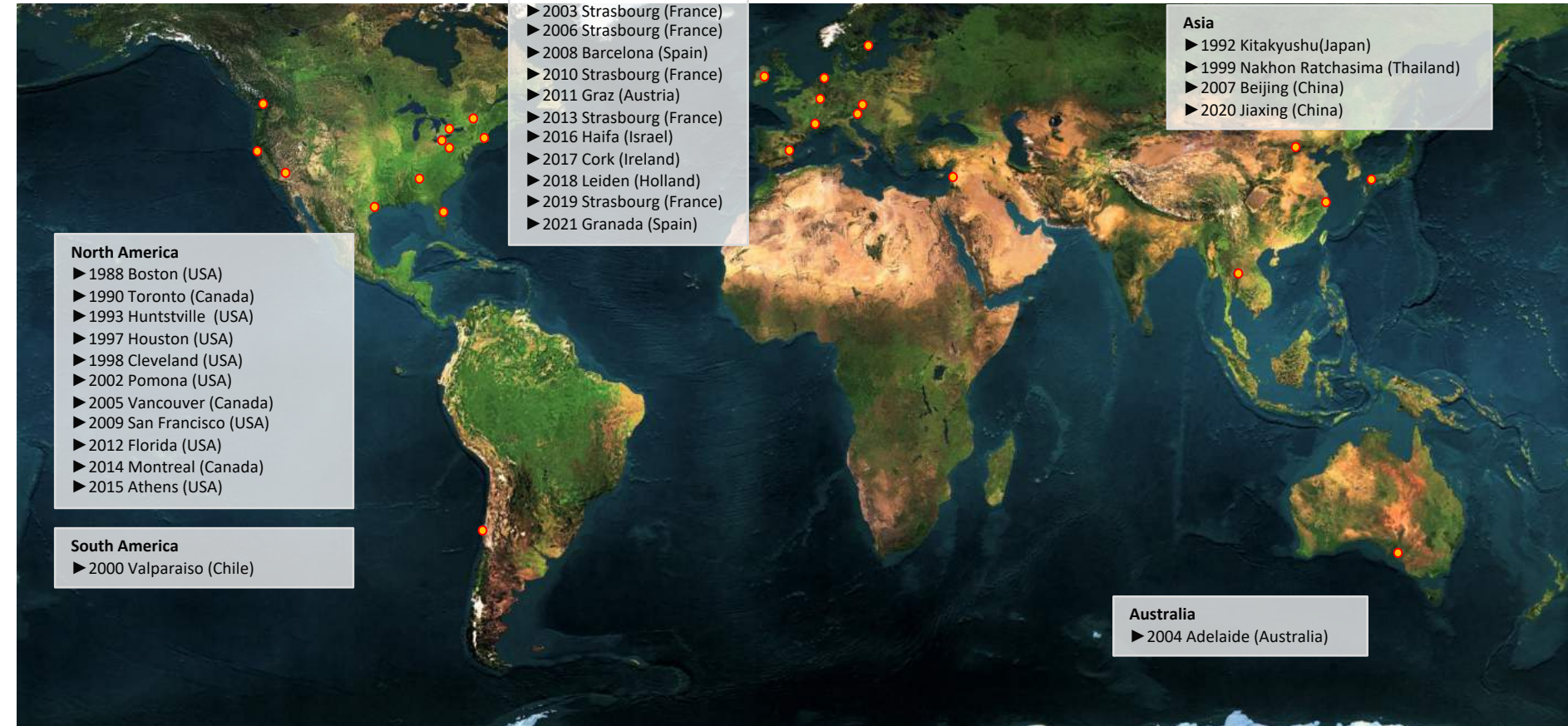
- 1988 Boston (USA)
- 1990 Toronto (Canada)
- 1993 Huntsville (USA)
- 1997 Houston (USA)
- 1998 Cleveland (USA)
- 2002 Pomona (USA)
- 2005 Vancouver (Canada)
- 2009 San Francisco (USA)
- 2012 Florida (USA)
- 2014 Montreal (Canada)
- 2015 Athens (USA)

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.



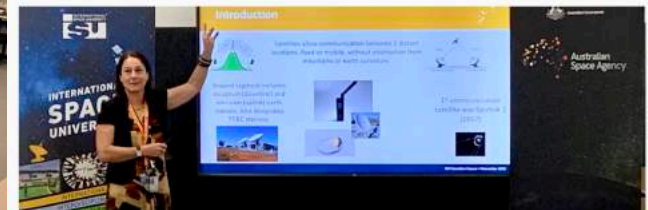
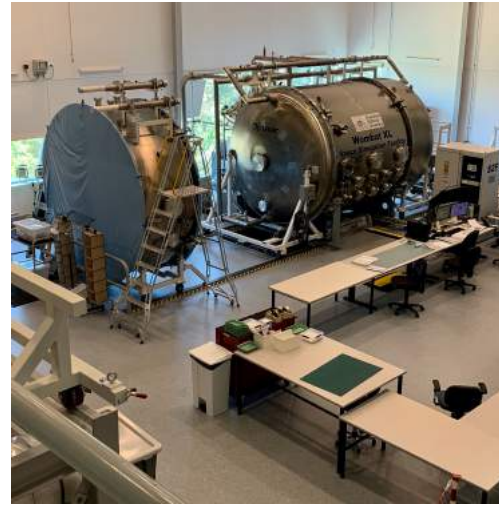
4.4 Commercial Space Studies Grad Cert

- 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



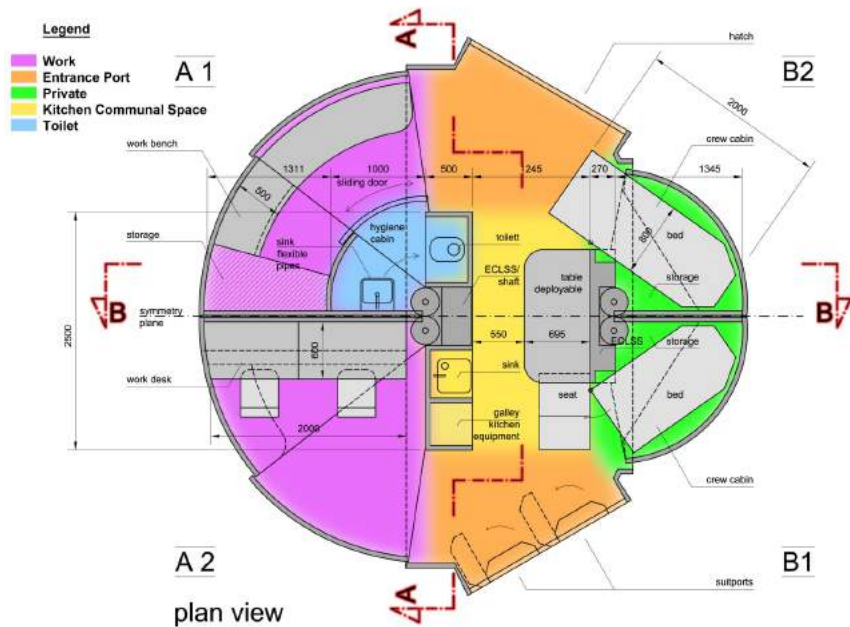
5. ISU Milestones

- 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

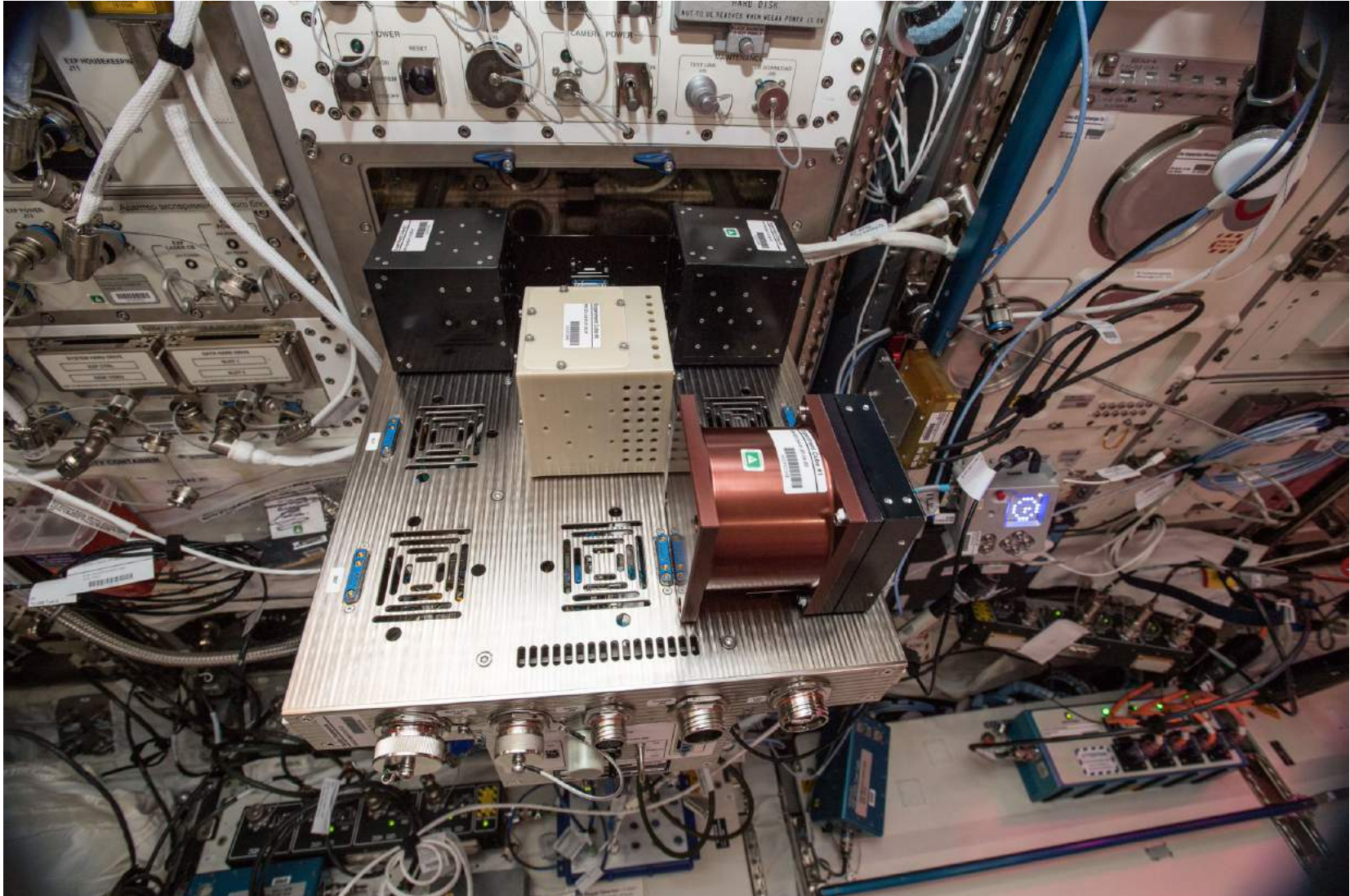
6. ISU Research

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



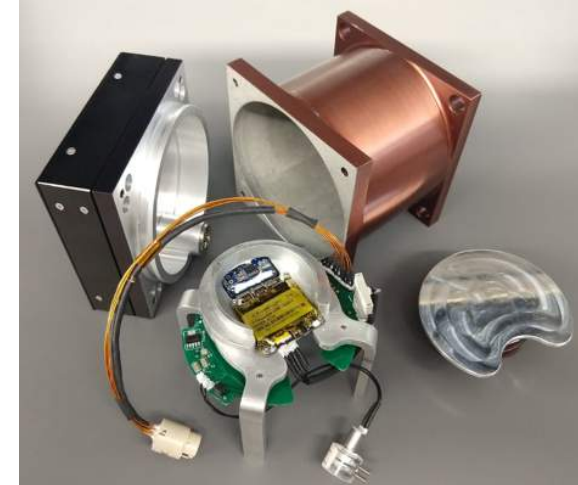
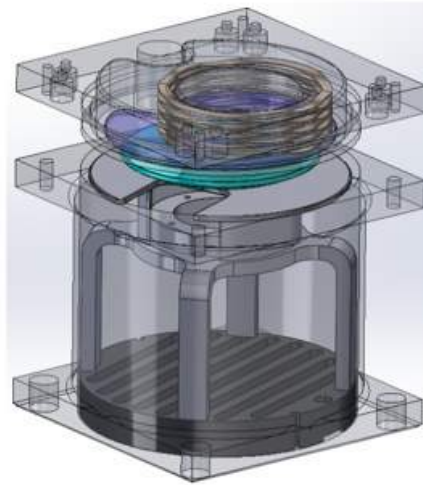
Hydra-1/Plant Growth Experiment

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.



Stanford
University



Université

de Strasbourg

Hydra-2/MMARS2

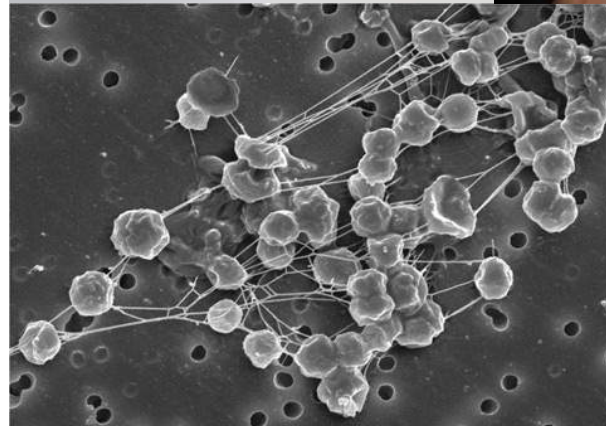
Launch: 29 June 2018 (CRS15)

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

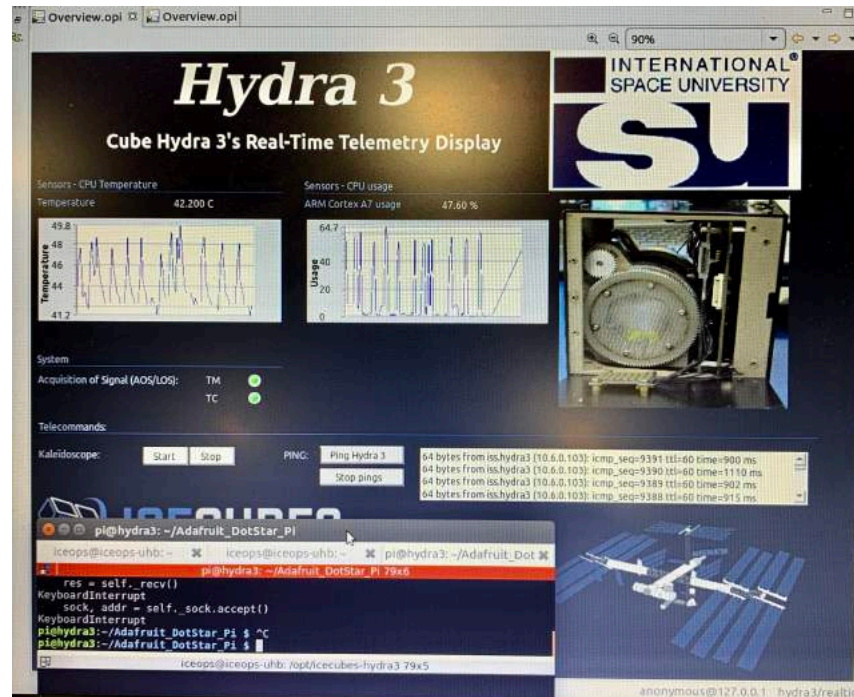
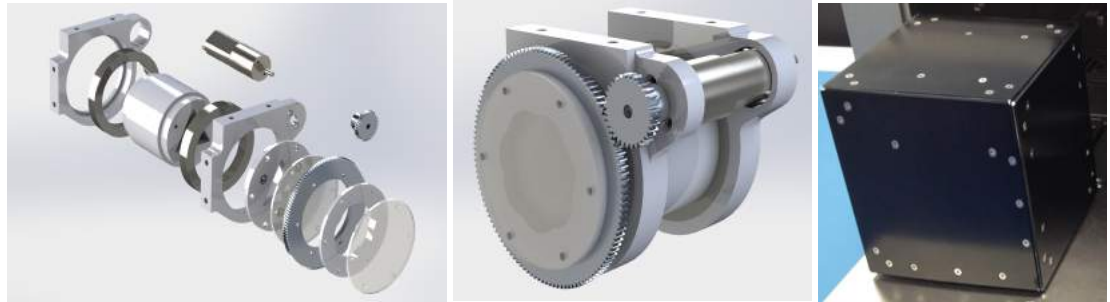
Launch: 29 June 2018 (CRS15)

Return: Early 2021 (tbd)

Partners: Studio Nahum,
MacQuarie University

Main objective: Interactive space
art payload

Secondary objective: Tech
demonstration of radiation
tolerant electronics + Orbital
poetry.

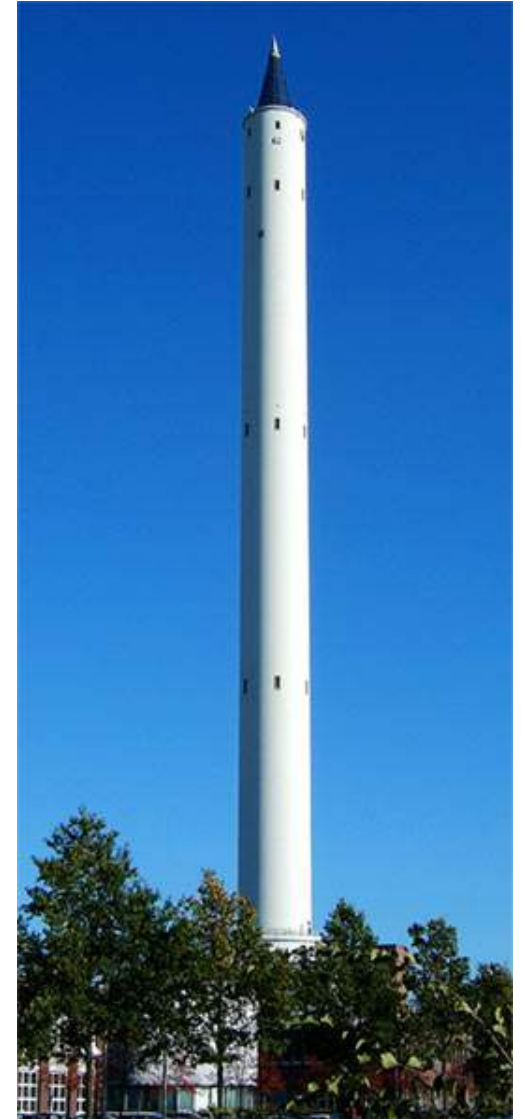


MACQUARIE
University



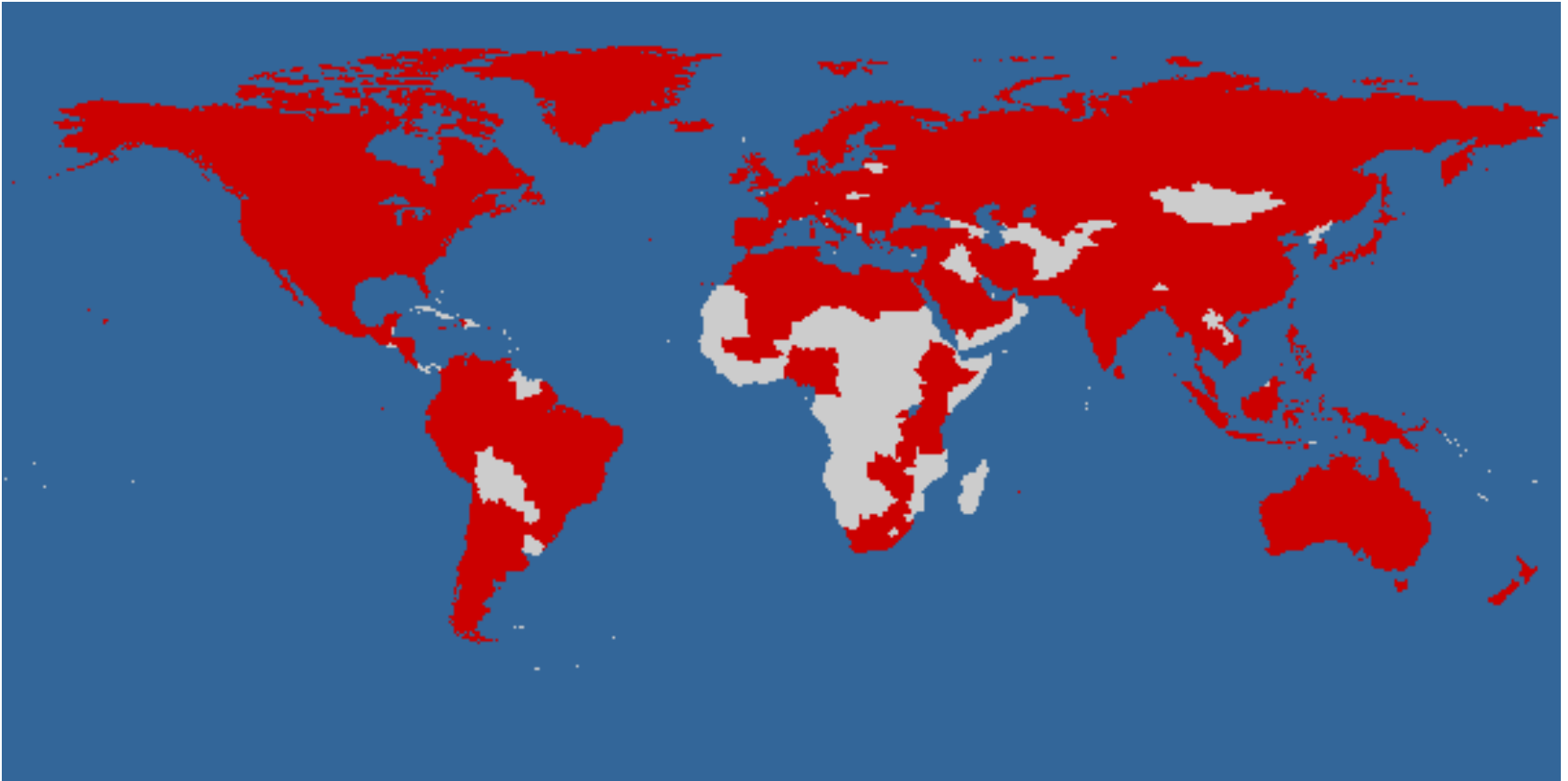
6.3 Single Bubble Sonoluminescence

- Student team were selected for 2019 ESA Drop Your Thesis campaign at ZARM in Bremen.



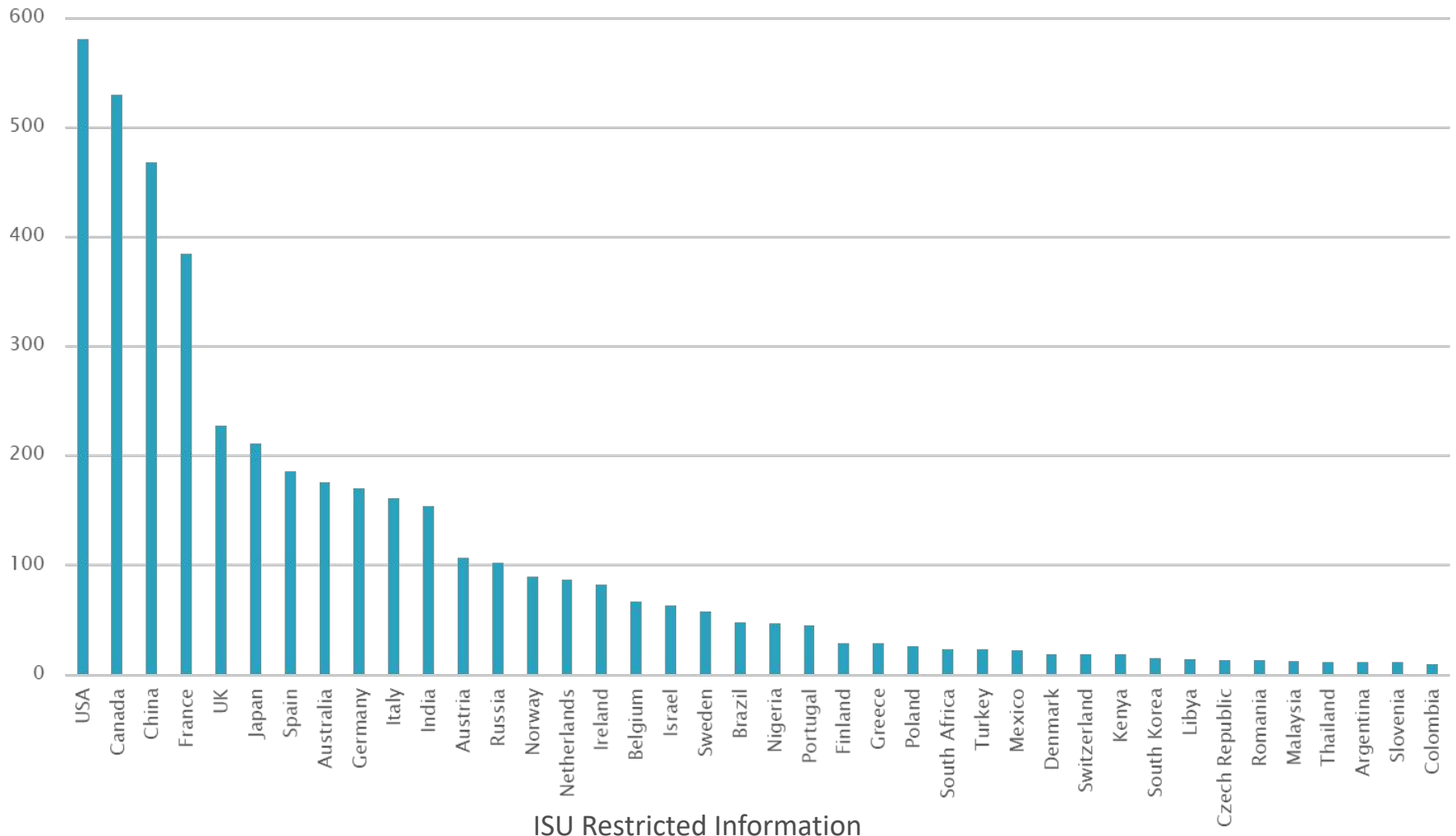
7. ISU - What it means

The 4500+ ISU alumni come from over 105 countries



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

Largest ISU Alumni countries



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 Manfretti
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
Spacell



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

i s p a c e

ICEYE



SPACEX



 spire



astrocast

**BLUE
ORIGIN**



Any questions?

Email: chris.welch@isunet.edu