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A Long Term ISU-UNISA Partnership: The SHSSP

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### Abstract

Since 2011, the Southern Hemisphere Space Studies Program (SHSSP) has been held six times in Adelaide, Australia. The last program, which ran from January 9 to February 10, 2017, saw the engagement of 39 participants from around the world and over 45 international experts, whose backgrounds encompassed the entire spectrum of disciplines relevant to space exploration, industry and technology. The participants had a broad range of experiences, being represented by undergraduate students all the way to professionals employed in national space agencies, and entrepreneurs. This provided an exciting mix of motivations and abilities, which clearly epitomised the purpose of the program: to expose highly achieving students in training as well as accomplished professionals to a proxy of the multidisciplinary and multifaceted environment typical of space enterprises. The international, intercultural, and interdisciplinary philosophy of the program was reflected in a diversity of lectures, hands-on workshops, public events and team exercises, delivered by experts from Australia, America, Asia and Europe. A capstone project on the small satellite revolution involving participants, faculty and consulting experts, was synthesised in a paper entitled ‘Small Sats Big Shift: Recommendations for the Global South’. The 2017 program was highly successful, and the five week live-in program, complemented by one optional week of intensive English as second language program carried out before the commencement of the SHSSP, is now an established educational offering of the International Space University - University of South Australia (UniSA) consortium, which is presently exploring longer term agreements to continue and expand this productive educational collaboration beyond the next program, to be held at UniSA in January-February 2018.

**Keywords:** (ISU, UniSA, Education, Space Program, Adelaide)

## 1. Introduction

In 2010 the International Space University (ISU) and the University of South Australia (UniSA) formed a consortium to launch a new space education program in the Southern Hemisphere. Designed as an intensive, five week, live-in experience held, the program is held in January and February each year. The program is open to participants from all disciplines, ages and nations, incorporating the international, intercultural, and interdisciplinary educational philosophy for which ISU is renowned.

As in other ISU programs, participants benefit from the shared experience of an international, interactive working environment shared with other professionals, graduate researchers and an international faculty. The SH-SSP is open to university students who have completed 2 years of an accredited university degree (full time), to graduates as well as professionals. Program graduates become part of the international network of ISU alumni, faculty members and visiting lecturers, now numbering more than 4,000.

## 2. Program history

ISU has been conducting international space education since 1988, with an expanding set of program offerings. It started with a two months Space Studies Program (SSP), which is held in different locations around the world in the northern hemisphere summer months of July and August. In 1995 a one year Master of Space Studies program was launched at the new ISU central campus in Strasbourg, France. Today the ISU program offerings include the annual Space Studies Program, the one year Master of Space Studies, a two year MSc in Space Studies and Thesis, and an annual Executive Space Course in Strasbourg. To date the ISU network comprises more than 4,000 alumni, and demand for its programs continues to grow.

The University of South Australia is one of Australia’s largest universities with over 30,000 students and campuses in Adelaide, regional South Australia, and a number of locations in Asia. It has a long standing collaborative relationship with ISU dating

back to the early 1990s. Its flagship Institute of Telecommunications Research (ITR) is internationally renowned as a leader in satellite telecommunications research. The ITR was a leading member of the consortium that designed, built and operated the Australian experimental satellite, FedSat1, launched in 2002. In addition, members of the ITR have been directly involved in the QB50 program. UniSA also has research and teaching expertise in remote sensing, geomatics, space and planetary science, including collaborations with NASA and ESA mission science teams.

The SSP has been offered 30 times around the world (the last time in Cork, Ireland), including twice in the southern hemisphere (in Valparaiso, Chile in 2000 and Adelaide, Australia in 2004). It is the goal of ISU to meet the space education needs of the entire world, and therefore a means to address this imbalance was sought by establishing the SH-SSP, specifically aimed at encouraging participation during the southern hemisphere summer months.

The space industry has changed significantly since the founding of ISU in 1988. New applications and technologies have developed, and the costs and benefits of space access have changed markedly. Many southern and developing nations are now placing increasing emphasis on the practical benefits of space, and are creating new space programs, cooperative initiatives, and agencies. These include not only the major players such as China, India and Brazil, but also Australia, Chile, Malaysia, Nigeria, Mexico, South Africa and others. These nations are looking for space education opportunities that match their level of development and capability, are cost effective, and compatible with their academic schedules. The SH-SSP aims to address these needs.

Given the collaboration between ISU and UniSA that resulted in the very successful 9 week ISU Space Studies Program held in Adelaide in 2004 and the close working relationship that was established, the two universities joined forces to submit a competitive bid for grant funding from the Australian Space Research Program in 2010 to develop a 5-week, intensive, live-in space educational program focused on the needs of the southern hemisphere nations, to be initially held in Australia. This proposal received an award of A\$475,658 for the period 2011 to 2013, and the first session of the program was offered in January-February, 2011 at UniSA's Mawson Lakes Campus, Adelaide, Australia.

The reputation of the program is such that it is now possible to hold the program annually without

government financial support. Furthermore, its continued relevance is such that over the years the program has attracted sponsorship from national and international bodies. An independent study commissioned by the Australian Government and published in November 2015 has confirmed the ongoing economic and social benefits of the government funding program that assisted the establishment of the SH-SSP (see [http://www.spaceindustry.com.au/Documents/Final\\_evaluation.pdf](http://www.spaceindustry.com.au/Documents/Final_evaluation.pdf)).

### 3. The Campus

The SH-SSP has been held each year at the Mawson Lakes campus of the University of South Australia in Adelaide. In addition to UniSA's contribution to the planning and the curriculum, on-site logistical, organizational and IT support is provided by UniSA staff. Program participants are registered as UniSA students, and have full access to campus library, athletic and computing resources. Accommodation is provided for faculty, staff and participants in modern, well-equipped air-conditioned apartments located in Mawson Lakes. Dedicated catering of all meals at facilities on campus and immediately adjacent, social events and public engagements are also provided.

### 4. The Program

The 5-week program is structured around four components, delivered over 200 hours of activities:

- 40-45 core lectures of one hour each in weeks 1, 2 and 3. These cover all areas of space activities.
- 60 contact hours of workshops, public events, professional visits and field exercises. Together with the core lectures, these constitute the principal educational component of the program.
- 45 contact hours for a White Paper group research project.
- 55 hours of independent work for the written exam and the preparation of the White Paper.

In 2017 the field exercise consisted in a dual stratospheric balloon launch culminating in the collection of visible-infrared imagery data from South Australia

(<https://www.youtube.com/watch?v=MvJyytIsfc4>).

The White Paper was entitled 'Small Sats Big Shift: Recommendations for the Global South' [1]. It highlighted how small satellites have made possible low cost launches thus enabling new nations to join into the exploration of space and to acquire capabilities for longer term developments in this area. All White Papers

are available online at:  
[https://isulibrary.isunet.edu/opac/?lvl=etagere\\_see&id=4](https://isulibrary.isunet.edu/opac/?lvl=etagere_see&id=4)

Articulation of the SH-SSP with UniSA programs is possible: the SH-SSP earns students credit for 9 academic units, equivalent to 25% of one year study (full time) in any discipline-relevant degree offered by the university, or 50% credits toward a Graduate Certificate in Space Studies. The Graduate Certificate offers participants the opportunity to focus on individual research and writing based on issues arising from their SH-SSP White Paper research, or from other topics, such as: space related science and technology, economics, law and policy. Staff from UniSA and ISU Faculty provide expert individual supervision for the projects over a period of one semester following the SH-SSP.

### 5. Participant profile

A total of 218 participants from all over the world completed the program between 2011 and 2017, comprising holders of post-graduate degrees, university graduates, and undergraduates who had completed at least 2 years of their university degree. Approximately 50% of the participants are from Australia, but the program enjoys significant participation from China National Space Administration (CNSA) and in 2017 also from the Indian Space Research Organisation (ISRO). The 39 participants in 2017 were from across the 5 continents: Asia 56%; Oceania 20%; America

15%; Europe 7%; Africa 2%. Their backgrounds were in: Space Applications: 27%; Engineering: 27%; Science: 19%; Business and Management: 14%; IT: 9%; Policy, Law and Humanities: 4%. Their qualifications were distributed as follows: PhD: 32%; Master: 29%; Bachelor or undergraduate: 39%. A significant proportion of participants are women, who represented 23% of students.

### 6. Conclusion

The SH-SSP experiment has demonstrated that the ISU formula for interdisciplinary, intercultural, international (and now intergenerational) space education is equally applicable to the needs of the Global South. Through strong institutional support, a sustainable program has been established, filling a seasonal gap in ISU's offerings. The benefits for both ISU and UniSA have been well recognised. The ISU - UniSA consortium is presently exploring longer term agreements to continue and expand this productive educational collaboration beyond the next program.

The next offering will be held at the Mawson Lakes Campus from January 15 to February 16, 2018.

### References

- [1] SHSSP 2017 Participants, Small Sats Big Shift: Recommendations for the Global South. 10 February 2017, <http://www.shssp.education/>.