



**International Space University
Space Studies Program 2023**

CALL FOR SSP23 MISSION CONTROL TEAM

26 June – 25 August 2023

São José dos Campos, Brazil

Response Deadline: 31 October 2022

This is an open call to the International Space University community to support the 2023 Space Studies Program. ISU is herewith soliciting responses, in particular from ISU alumni, to contribute to the success of the program as a member of the SSP23 Mission Control Team. The SSP academic activities are briefly described below. For more information about SSP and SSP23, see: isunet.edu/ssp and ssp23.isunet.edu

The SSP is formatted in three interrelated phases

- Phase I (Core): Weeks 1-4 that include core lectures, workshops, departmental activities, and initial team project work
- Phase II (Department): Weeks 4-6 that include core lecture wrap-up, departmental activities, workshops, departmental visits, individual project work, and team project work
- Phase III (Team Project): Weeks 6-9 focused solely on team projects completion.

Program Element Descriptions

Core Lectures – Series of up to 55 lectures given over the course of the first four weeks of the program covering fundamental concepts across all disciplines.

Workshops (WS) and Theme Days – These sessions focus on disciplinary or interdisciplinary topics, which include hands-on or participatory interactive experiences for the participants. Workshops and Theme Days take place during Phases I & II (27 June – 4 August 2023).

Departmental Activities (DA) – These sessions focus on specific departmental activities to include in-depth lectures, workshops, professional visits, individual or small team project work, or any other active learning activity deemed appropriate by the department chair. The departmental activities take place during Phase II (17 July – 4 August 2023).

Team Projects (TP) – SSP participants address a relevant space topic as an international, interdisciplinary, and intercultural team to produce a final report, executive summary, and an academic presentation available in open access to the broad space community through the ISU library. TP work spans all three phases of the program becoming the sole focus in Phase III, which is the last three weeks of the SSP session (7 August – 25 August 2023).

Who We Need

The SSP Mission Control Team is soliciting responses to this call to fill the following roles:

- Finance Officer
- Academic Assistants
- Teaching Associates
- Faculty Liaison
- Librarian
- Information Technology Officers
- Audio-Visual Officers
- Communications Coordinator
- Media Producers
- Social Media Officer
- Event Coordinator
- Logistics Assistants
- Participant Liaison

SSP mission control team members are a highly visible part of each SSP and are expected to maintain a high degree of professionalism in delivering the ISU experience to the participants.

Minimum Qualifications

To qualify for a Faculty Liaison, Participant Liaison, or Teaching Associates the successful completion of the ISU SSP, SHSSP, or MSS Program is of advantage. By successfully completed, that means you must have passed the program and received a “Certificate of Completion.”

For the other positions, while preference is given to ISU alumni, one need not be an alumnus/alumna, however, experience relevant to the position is strongly desired.

When We Need You

The Academic Assistants, Logistics Assistants, and Finance Officer are required to be available for a six-months duration as below:

ONLINE(*): Monday, 6 March 2023 through Friday, 2 June 2023
+
ONSITE: Saturday, 3 June 2023 through Saturday, 2 September 2023

The Participant Liaison, Faculty Liaison, Communications Coordinator, Events Coordinator, and Social Media Officer are required to be available for four months of commitment as below:

ONLINE(*): Monday, 2 May 2023 through Friday, 2 June 2023
+
ONSITE: Saturday, 3 June 2023 through Thursday, 31 August 2023

The Teaching Associates are required to be available for virtual training and team coordination meetings prior to the program and 11.5 weeks of on-site presence as below:

Time commitment of 5 hours/month for virtual training sessions and team coordination meetings between 6 March 2023 - 3 June 2023
+
ONSITE: Saturday, 10 June 2023 through Thursday, 31 August 2023

The IT Officers and Media Producers are required to be on site for 12.5 weeks as below:

ONSITE: Saturday, 3 June 2023 through Thursday, 31 August 2023

The Audio-Visual Officers, Librarian are required to be on site for 11.5 weeks as below:

ONSITE: Saturday, 10 June 2023 through Thursday, 31 August 2023

(): The “online” segments will include synchronous work and virtual meetings with the SSP Management for 5 days/week.*

Duties (grouped into functions)

- **Finance Officer:** Keep the log of monetary operations and handle payments
- **Academic Assistants:** Support the Academic Office tasks in design, execution and digital archiving of academic activities
- **Teaching Associates:** Serve as the main executors of all front-line academic operations (academic, workshops, public events)
- **Faculty Liaison:** Serves as the primary point of contact for the faculty members
- **Librarian:** Facilitate participants’ research via ISU library tools
- **Information Technology Officers:** Support the program IT needs
- **Audio-Visual Officers:** Support the program AV needs
- **Communications Coordinator:** Lead the SSP communications team for external relations, communications with national and international press, social media, and written & media context production
- **Media Producers:** Create media content (photos & videos) during program activities and generate the retrospective video compilation
- **Social Media Officer:** Generate and publish content on the program social media accounts
- **Event Coordinator:** Serves as the planner of public events and manage the execution of these events
- **Logistics Assistants:** Supports the Logistics Office tasks related to accommodation, meals, transportation, and inventory
- **Participant Liaison:** Serves as the primary point of contact for the participants for academic, logistics, and health matters

Compensation Provided

SSP23 Mission Control Team members will be provided with:

- Transportation costs: One economy class round-trip travel to the SSP venue to cover their onsite dates of service
- Accommodations at the SSP residence during their onsite dates of service
- Meals during their onsite dates of service

- Opportunity to attend to specific professional and cultural visits of the academic program
- Networking opportunities with the ISU faculty & visiting lecturers, SSP chairs, participants, distinguished lecturers, and other well-known individuals and officials working in the space business
- Mission allowance of 100€/week during the onsite dates of service, to be paid via bank transfer in lump-sum at the end of each month of the mission.
- Mission allowance of 50€/week for the positions with pre-program “online segment” work, to be paid via bank transfer in lump-sum at the end of each month of the mission.

How to Respond to this Call

Responses to SSP23 Calls will be accepted through **ISU Buzz Platform** ONLY.

- Your application should be submitted through the <https://buzz.isunet.edu/apply-ssp23-mission-control-team>
- Complete the online form providing all requested information.
- If you want to apply for multiple positions, please submit separate applications for each position you want to apply.

Evaluations

Under the authority of the Dean and supervision of the Academic Council, the SSP Team will review the responses resulting from this call and select the most qualified individuals to fill the SSP Mission Control Team positions. Teaching Associates will be selected jointly and in collaboration with their Department/Team Project Chair(s). Shortlisted applicants will be called for an interview. After the interviews, the selected Mission Control Team members for SSP23 will be notified. The applicants who are not selected will also be notified.

The composition and structure of the SSP Mission Control Team is driven by an international representation, who wish to learn from each other and who are being mindful of the cultural differences. Therefore, the SSP workspace is organized as an internationally friendly and broadly diverse environment, based on the ISU Code of Conduct and Anti-Harassment Policy. We are looking for pro-active persons, who can commit to the SSP attributions, who are eager to learn and are ready to contribute with their international skills to the success of the SSP. SSP Management retains the right to re-arrange the roles during the program. Please note that SSP Mission Control Team are NOT participants and should respect those responsibilities while on duty. In case of unsatisfactory delivery of their attributions during the SSP, SSP Management retain the right to exclude individuals from the SSP Mission Control Team.

Important Dates

- Response to Call due: **Sunday, 31 October 2022**
- Evaluations: **November 2022-December 2022**
- Acceptance Notifications: **NLT 15 January 2023**
- Visa application: **minimum 2 month prior to your dates of travel.**

You will be notified if you are not selected. These notifications will be sent by February 2023.

If you have any questions, contact us via e-mail: ssp.director@isunet.edu

APPENDIX – SSP23 TEAM PROJECTS

The Team Projects for SSP23 that were selected and approved by the Academic Council are described below.

TP #1 – Smart Cities in the Context of Latin America: Space-based Solutions

According to United Nations reports, in 2020 about 55% of the world population lives in urban areas, and this percentage is expected to reach 70% by 2050. This reality is already true in several countries, as in Brazil, for example, where almost 85% of the population lives in so-called urban areas considered. For these people, life quality is directly affected by the quality of the urban environment they inhabit. This is certainly one of the reasons why cities went frequently through technological, economic, and cultural innovations in order to provide better coexistence conditions to their citizens. In this scenario, a concept called Smart Cities (SC) is growing around the world, which use high technology to solve complex problems and optimize resources usage, thus improving human life quality. The SC concept is often associated to the design from scratch of new urban areas based on efficient and sustainable technological solutions. However, fully consolidated cities have been also trying to promote innovations and adopting good practices following this concept. Singapore and Dubai are working in this direction, for example. In Brazil, São José dos Campos became the first city to qualify as a SC. Several other Brazilian cities are working hard to achieve the SC qualification. However, these efforts can be very challenging the more complex the city is. The reality in the big cities in Brazil, but also in Latin America, Africa, Asia and other developing countries, deal with high population densities, irregular housing (which are very vulnerable to climate changes), reduced mobility, environmental and noise pollution, high crime rates, poor public services, and low sanitation. The adoption of SC solutions can help to address these cities' main issues with a huge social impact. The United Nations is also concerned about the SC concept including in the “2030 Agenda” the theme Responsible Cities and Communities as the Sustainable Development Goal 11 (SDG 11). However, the discussion of urban life quality reaches several other SDGs, such as Health and Well-being, Clean Water and Sanitation, Clean and Accessible Energy, Economic Growth, Resilient Infrastructure, Reduction of Inequalities and Actions against Global Climate Change.

Main Issues to be addressed:

This Team Project proposes to point out “space-based technologies and applications” (downstream) to solve (or advance in the knowledge of) the current problems faced by the Latin America large cities, trying to demonstrate the economic viability of solutions from the perspective of social and environmental impacts, and indicating future potential markets. In Brazil and in many other countries, space is a sector

somewhat distant from the routine of the common citizen, although it is responsible for the creation of many technologies that we currently use on our daily lives. The change of paradigm of the space sector (the so-called New Space) represents an opportunity to address social needs, creating a market for space services (upstream and downstream) and improving the citizens' life quality. In this context, the Team Project intends to discuss and evolve towards a strong integration of all dimensions of human intelligence, collective intelligence, and also artificial intelligence within the city. This intelligence will help address with high population densities, irregular housing, reduced mobility, environmental and noise pollution, high crime rates, poor public services, and low sanitation. Moreover, it is important also to address the economic, political and social impacts and costs associated to the main challenges and also the knowledge and space technologies, gaps and opportunities for SC solutions, technological feasibility, market potential, economic viability, and business plan.

TP #2 – Water Security

Science clearly points out the impacts that climate change generates on the hydrological cycle, changing past patterns, from more severe and prolonged droughts to extreme rain events. Considering the UN definition of water security (“the ability of the population to access water of acceptable quantity and quality for the maintenance of their livelihoods, well-being and socioeconomic development, associated with the protection of water resources from pollution and disasters, as well as the preservation of ecosystems within an environment of peace and political stability”), advancing on the understanding of the implications of climate changes on sustainable development, focusing on the perspective of water, is presented as an extremely relevant priority. In a dynamic and uncertain future, obtaining timely information with the necessary quality is crucial managing resources, for identifying vulnerabilities and for adaptation measures, and space science tools have an important role to play in such theme.

Main issues to be addressed:

Given that the majority of these climate change impacts will be felt through the medium of water, the TP shall explore the interrelationships and inter-linkages between water, climate change and sustainable development. Water security necessarily requires the exchange of knowledge so that the human, economic, ecosystem and resilience dimensions are actually protected. Hence, aligned communication, recognition of epistemologies and results must be transparent and synthesized in an aligned manner.

TP #3 – On-Orbit Collision Avoidance Support Service, a safer Space supported by Space Situation Awareness (SSA) Systems

The teams involved in the TP are requested to propose a framework for an On-orbit collision Avoidance Support Service. To provide collision avoidance, this service should be able to:

- Provide services based on a continuously updated catalog of satellite tracking data,
- Utilize automated processes for collision avoidance,
- Provide actionable and timely conjunction assessments, and
- Provide data to operators to enable assessment of maneuver plans.

To ensure safe coordination of space traffic in this future and international operating environment, the teams should also think in policy and legal aspects involved in the creation of a Coordination Center to operate as the focal point for this collision avoidance support service.

Main issues to be addressed:

- 1) Review of main types of sensors and system architectures used for SSA that are already in operation
- 2) Define a framework of Sensors, possibly including Ground Based and Space Based solutions, to continuously provide data for catalog updating. Aspects related to trade-off analysis, advantages and disadvantages associated to the adoption of a particular solution should be explicit
- 3) Propose On-orbit tracking aids for operating satellites, including beacons, or sensing enhancements (if such systems are needed)
- 4) Define Minimum Safety Standards and Best Practices for Operating in a Congested Space Environment using either existing protocols as the U.S Government ODMSP as reference or proposing new criteria considering future scenarios as large constellations in LEO and missions beyond Near Earth's orbit. These safety guidelines should consider maneuverability, tracking, reliability, and disposal.
- 5) Identify basic Data Quality Criteria and Appropriate minimum reliability based on type of mission and phase of operations to attend the precision requested by the Minimum Safety Standards

- 6) Define different scenarios for Sensor allocation to meet Data Quality criteria (e.g., Possibility to fuse data from a Telescope and a Radar to improve the uncertainty associated to the observations.)
- 7) Define what inputs of information should be provided to the On-Orbit collision avoidance service, e.g.:
 - Management of orbit utilization to prevent conjunctions.
 - Constellation owner-operators' management of self-conjunctions.
 - Owner-operator notification of planned maneuvers and sharing of satellite orbital location data.
 - Notifications in advance of planned orbit injections.
- 8) Propose a standardized protocol for Data Sharing that enables the development of applications to leverage the data. The teams should evidence the advantages and disadvantages associated to the adoption of a particular existing protocol (e.g., TLE, CCSDS) or in the proposition of a new data format (if necessary).