



**International Space University
Space Studies Program 2020**

CALL FOR STAFF AND TEACHING ASSOCIATES (TAs)

22 June – 21 August 2020

Shenzhen University, Shenzhen, China

Response Deadline: 15 September 2019

This is an open call to the International Space University community to support the 2020 Space Studies Program. ISU is herewith soliciting responses, in particular from ISU alumni, to contribute to the success of the program as a Teaching Associate (TA) or as a member of the SSP20 Staff. The SSP academic activities are briefly described below. For more information, see: ssp.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 60 one-hour lectures given over the course of the first four weeks of the program covering fundamental concepts across all disciplines.

Workshops (WS) – 4-hour sessions focused on disciplinary or interdisciplinary topics, which must include hands-on or participatory interactive experiences for the participants. Workshops take place during Phases I & II (*23 June – 31 July 2020*).

Departmental Activities (DA) – Three-hour sessions focused 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 (*13 July – 31 July 2020*).

Team Projects (TP) – SSP participants address a relevant space topic as an international, interdisciplinary, and intercultural team to produce a final report and executive summary for broad distribution in the space community. 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 (*3 August – 21 August 2020*).

For the SSP20 the ISU Academic Council has selected four team projects (see appendix).

Who We Need

Teaching Associates: The SSP team is soliciting responses to this call to fill eleven (11) Teaching Associate positions - seven (7) for the departments and four (4) for the Team Projects. The SSP departments are Space Humanities (HUM), Space Management and Business (MGB), Space Engineering (ENG), Human Performance in Space (HPS), Space Sciences (SCI), Space Policy, Economics, & Law (PEL), and Space Applications (APP). The four Team Projects are described in the appendix.

Staff Positions: The SSP team is also soliciting responses to fill seven (7) Staff positions – Academic Assistant, Logistics Assistant, Research Assistant/Accountant, Participant Liaison, External Relations Assistant, Information Technology Assistant, and Audio Visual Assistant.

Teaching Associates and SSP Staff 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

Teaching Associate: To qualify for a TA position, you must have successfully completed the ISU SSP, SHSSP, or MSS Program. By successfully completed, that means you must have passed the program and received a “Certificate of Completion.”

Staff Positions: While preference is given to ISU alumni for SSP staff positions, one need not be an alumnus/alumna to apply for the positions listed and briefly described in the online form on the ISU Involve platform. Experience relevant to the position is strongly desired.

When We Need You

TAs and most staff members are required to be on site for the full duration of three phases of the SSP:

Saturday, 13 June 2020 through Saturday, 22 August 2020

The logistics/academic/IT assistants as well as the Participant Liaison will be required to arrive one week earlier and are required to be on site:

Saturday, 6 June 2020 through Saturday, 22 August 2020

Duties

If you are not already familiar with the duties of an SSP Staff member or TA based on your ISU program experience, you may request position descriptions by e-mailing: sspacademics@isunet.edu

Teaching Associates must work seamlessly with the Department and Team Project Chairs in the delivery of the SSP. TAs provide support to all aspects of the academic program in addition to the department or TP to which they are assigned. This includes workshops, distinguished lectures and panels, and any other academic activity deemed appropriate by the SSP Director. Within their Department or Team Project, TAs support all departmental activities, including departmental workshop preparation, professional visit logistics, and coordinating the logistics of departmental faculty.

Staff positions include support to the Academic Coordinator or Logistics Coordinator, duties as Research Assistant and accountant, liaison between the participants and ISU staff, support of external relations unit, and information technology/audio visual support.

Compensation Provided

TAs and Staff members will be provided round-trip travel to the SSP venue. As well, your accommodations and meals will be provided for the duration of your stay. You will be paid a stipend equivalent to 100€/week. You will also have the opportunity to network with the ISU faculty & visiting lecturers, SSP chairs, participants, distinguished lecturers, and other well-known individuals and officials working in the space business.

How to Respond to this Call

Responses to SSP20 Calls will be accepted through **ISU Involve Platform** ONLY.

- If you have not already done so, you will need to create an account **on ISU Involve Platform** (involve.isunet.edu) using your preferred e-mail address and password.
- Complete the online form providing all requested information.

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

Evaluations

The SSP Academic and Logistics Coordinators will review the responses resulting from this call and select the most qualified individuals to fill the staff positions.

Departmental and team project chairs will review the departmental and team project TA applications and provide the SSP Director and SSP Academic Coordinator with their preference.

The SSP Academic Coordinator may contact the shortlisted applicants to arrange a conference call interview. After the conference call interview, the selected staff members for SSP20 and TAs will be notified. The applicants who are not selected will also be notified.

Important Dates

- Response to Call due: **Sunday, 15 September 2019**
- Response Submitted to Chairs: **23 September 2019**
- Evaluations: **October 2019-April 2020**
- Acceptance Notifications: **NLT 1 April 2020**
- Visa application: **minimum 2 months before your dates of travel; 3 months recommended.**

You will be notified if you are not selected. These notifications will be sent by 15th of April 2020.

For more information, please refer to ssp.isunet.edu

APPENDIX – SSP20 TEAM PROJECTS

The Team Projects for SSP20 that were selected and approved by the Academic Council are described below.

TP #1 – On-Orbit Mobility and Manipulation

Controllable on-board propulsion is essential for trajectory correction, orbit insertion, station keeping, rendezvous and other satellite and deep-space purposes. For many years, people have been concerned over its use in anti-satellite weapon systems. Today this concern has become more important because society is increasingly dependent upon the plethora of vulnerable space services. Proposals for new international agreements to ward off a space arms race are circulating, but most experts are pessimistic, at least in the near term. As well, established technologies now permit the creation of spacecraft that can rendezvous with existing spacecraft and repair, refurbish or (in LEO at least) deorbit them. This development further increases the concern that such spacecraft might be used for nefarious purposes. The goals of this team project are to assess the present situation and document practical ways for the world to continue to enjoy the benefits of maneuvering technology (including new uses such as debris removal, clean-up, and planetary defense) as well as to examine servicing opportunities brought about with the development of robotic technologies for in-orbit servicing while reducing the chance of these technologies being misused. In addition, the project will define the technical and management character of a complete ground-based and space operations system consisting of multi-purpose buses and special-purpose payload assemblies for servicing a variety of ongoing missions.

All of the required technologies for both peaceful and space-war maneuvering have been demonstrated, including interception and destruction of satellites. In view of the acknowledged obstacles to a prompt resolution of the problem of military space aggression, an independent, interdisciplinary analysis could prove useful as a contribution to multinational discussions and bilateral agreements. The venues for these discussions and agreements are already in place at the UN, EU and other international policy centers. New methods for conflict resolution are being applied; e.g., by the Western Justice Center. Of equal importance is the history of the Hubble Space Telescope, which shows the potential value of on-orbit repair and refurbishment. In addition, there is a growing need for means to change the orbits (including deorbiting from LEO) of retired space objects to reduce orbital congestion and collision hazards. Human flight for these purposes was shown to be effective in the Shuttle era, but now robotic execution should be considered as a practical alternative.

Given the variety of needs, robotic interceptor spacecraft should consist of common buses and unique servicing payloads. The buses for such spacecraft should exploit

high-powered electric propulsion to enable visiting multiple and varied targets, particularly given that current missions (e.g., Dawn) have shown the potential of using electric propulsion for visiting multiple targets and operating in varied orbits, capabilities now available for servicing. Orbital congestion is a rising hazard. Servicing provides the prospect of both scheduled mission extension and mission salvage after on-board failure. The report from this TP should address not only problems associated with controllable satellite mobility and manipulation, but also potential opportunities, for example, those presented by the planned development of high-powered electric propulsion plus nonaggressive uses of repurposed military space assets. The problem and its solutions are intrinsically international. No solution can be accepted without multicultural public support.

Main Issues to be addressed:

- Movement in several nations toward renewed development of anti-satellite weapon systems.
- Lack of understanding of the potential of new maneuvering techniques.
- Absence of public appreciation of these potential problems and support for innovative solutions.
- Limits of knowledge about servicing opportunities in the world's existing space fleets.
- Lack of practical designs for interceptor robotic spacecraft and operations.
- Absence of workable program plans for international multi-purpose servicing projects.

TP #2 - International Cooperation on the Use of the China Space Station

The Chinese space station is scheduled to be completed and put into operation around 2022. The Permanent Mission of China to the United Nations and other international organizations in Vienna and the United Nations Department for Outer Space Affairs jointly issued a bulletin on opportunities for international cooperation on the Chinese Space Station, inviting countries and institutions from all over the world to cooperate in space science experiments on the Chinese Space Station. According to the Announcement of Opportunities for International Cooperation on the Use of the Chinese Space Station, the Chinese Space Station is open to all countries, organizations and private entities, providing scientists around the world with the opportunity to conduct space science experiments on the Chinese Space Station. This is not only a new attempt for China, but also the beginning of a new era of international space cooperation for countries, organizations and individuals all over the world.

Main issues to be addressed:

- On board experimental projects design and conduct
- International Astronaut Selection and Training
- Relations with the existing International Space Station
- Innovative project design
- Design and organization of Science Popularization Activities and other cultural programs.
- Reserve and communication mechanisms in policy areas such as definition of intellectual property rights, cultural integration and international space law.

TP #3 - The Space Medical Centre

Many medical questions are still opened when planning crewed missions in outer space, especially beyond Low-Earth-Orbit. Long-term human body adaptation might lead to severe medical conditions with the potential of a dramatic impact on the mission success. In addition, there is a risk of unseen medical conditions as the humans would be exposed to extra-planetary environments for the first time. The use of advanced technology and autonomous systems can help but it, up to now, is not comprehensive yet. Then, re-entry is always a rule, not feasible for missions beyond LEO.

There is a need of a more immediate solution, as a framework that would facilitate the management of health in space and that be accessible to a larger number of people: the Space Medical Centre (SMC).

This is a platform to be built in space by scratch or by using already existing space objects. The SMC is: (i) a clinic, (ii) an emergency centre, (iii) a rehabilitation centre and (iv) a training centre. This platform could be located anyway, and could include movable parts that would travel in space in the proximity of the medical emergency. The SMC is used by astronauts and tourists. Moreover, considering the importance of clinical and translational medicine, the SMC guests researchers, participants of human studies, and people seeking for a new treatment of terrestrial disease. In the end, the SMC is a reference platform to be used by medical insurances for medical coverage of astronauts and tourists.

To allow the SMC to exist, a business model needs to be established facing legal challenges that have to account of medical assistance in outer space. Then, as the platform can be composed by movable parts and can have twin stations, placed between destinations, the use of resources shall be addressed as the SMC shall be almost independent from natural terrestrial resources. What is the impact of the SMC on the incoming crewed missions? What is its impact on terrestrial medicine (in terms of health, business and research)?

Main issues to be addressed:

Up to now, there is no space medical insurance both for astronauts and space tourists so the monetary evaluation of medical conditions is opened. The legal challenges of providing medical assistance in space, and the safety, ethics and contamination are still opened. In particular, the case of combined terrestrial and space treatments includes considerable legal and medical opened challenges.

TP #4 – Intercontinental Sub-Orbital Commercial Liner

From the space shuttle in 1980s to commercial suborbital/orbital travel in recent years, rapid intercontinental passenger/cargo transportation using aerospace technology will likely be commercialized. This concept could be based on a kind of fully re-used rocket-boost sub-orbital passenger/cargo vehicle (or any other technical approach), which vertically launch at the launch site in/near the airport, with a vertical landing rocket booster and a sub-orbital manned vehicle horizontally landing at the target airport. It could achieve safe and convenient two-hour intercontinental passenger/cargo transportation for the business elites and the general public.

The use of reusable space transportation technology to build a fast and convenient intercontinental passenger/cargo flight has great commercial value in the future, and its related technical, commercial and legal issues are worthy of investigation.

Main issues to be addressed:

- An overview of the technical route of the intercontinental sub-orbital commercial flights
- Intercontinental sub-orbital commercial flight technologies
- Management organization definition
- Business plan and financing plan proposal
- International legal issues and main provisions involved in this project