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UN strategy lifts capacity for non-spacefaring countries



SNC

▲ Artist's view of Dream Chaser in Earth orbit.

The United Nations Office for Outer Space Affairs (UNOOSA) is pursuing a remit to ensure all of humankind can benefit from the use of space. Its latest initiative is a partnership with the space firm Sierra Nevada Corporation (SNC), which was announced in June 2016 with further details provided at the International Astronautical Congress (IAC) in Mexico in September. From 2021, the UN will partner with SNC to use the company's Dream Chaser vehicle to offer Member States affordable unmanned reusable flights to low-Earth orbit (LEO) on the first ever United Nations space mission. In her article for *ROOM*, UNOOSA Director Simonetta Di Pippo explains why this is such an important initiative and how it will benefit developing countries.



Simonetta Di Pippo
Director of the United Nations Office for Outer Space Affairs, Vienna, Austria

At UNOOSA we promote increased access to and use of space-based technology and applications, including by helping Member States develop their own capabilities. In 2010 we launched our Human Space Technology Initiative (HSTI) to involve more countries in activities related to human spaceflight and make space exploration a truly international effort, inclusive and open to everyone.

Our partnership with SNC forms part of a wider strategy under HSTI of building space capacity of non-space-faring countries, particularly developing countries, so that they too can benefit from space technologies and activities.

We already have a number of other projects under the HSTI that complement the SNC partnership. KiboCUBE, an initiative with the Japan Aerospace Exploration Agency (JAXA), offers educational and research institutions from developing countries the opportunity to deploy cube satellites from the Japanese Kibo module of the International Space Station (ISS).

With JAXA, we recently selected the first successful candidates for this programme - a team from the University of Nairobi. The launch of their cubesat later in 2017 will allow Kenya to have a satellite in orbit for the very first time.

Bringing the benefits of space to humankind



UNISPACE
+50

◀ Simonetta Di Pippo and Mark Sirangelo, head of Corporate Systems at SNC, after announcing further details of the partnership at the IAC in Mexico.

A fellowship programme has given research teams in recent years the opportunity to conduct microgravity experiments at the Bremen Drop Tower in Germany. Also under the HSTI, an agreement signed this year between UNOOSA and the China Manned Space Agency will enable Member states to conduct space experiments onboard China's future space station.

We have received significant interest and a large number of applications for the projects already underway, such as KiboCUBE and the Bremen Drop Tower, and we expect even more interest for using the China Space Station and the Dream Chaser.

Through these projects we facilitate developing countries' access to a range of space activities. Partnerships, such as the United Nations Dream Chaser mission, will progress one of our core activities - capacity-building - into a more innovative approach for the 21st century.

Developing countries

The dedicated United Nations Dream Chaser mission will provide UN member states - with a focus on developing countries - the opportunity to develop and fly experiments in microgravity conditions for an extended duration in orbit.

This will be especially beneficial to countries which cannot afford their own standalone space programme but will, through this initiative, have the possibility of conducting research in space.

One of UNOOSA's key roles in the mission will be to collect and select research proposals, which can be on any topic that supports the fulfilment of the Sustainable Development Goals, such as studying climate change, food security, global health, or water resources.

— In other words, UNOOSA, thanks to the United Nations Dream Chaser mission, will enable developing countries, even if not exclusively, to access space to perform experiments in orbit in line with the objectives of the 2030 Agenda for Sustainable Development.

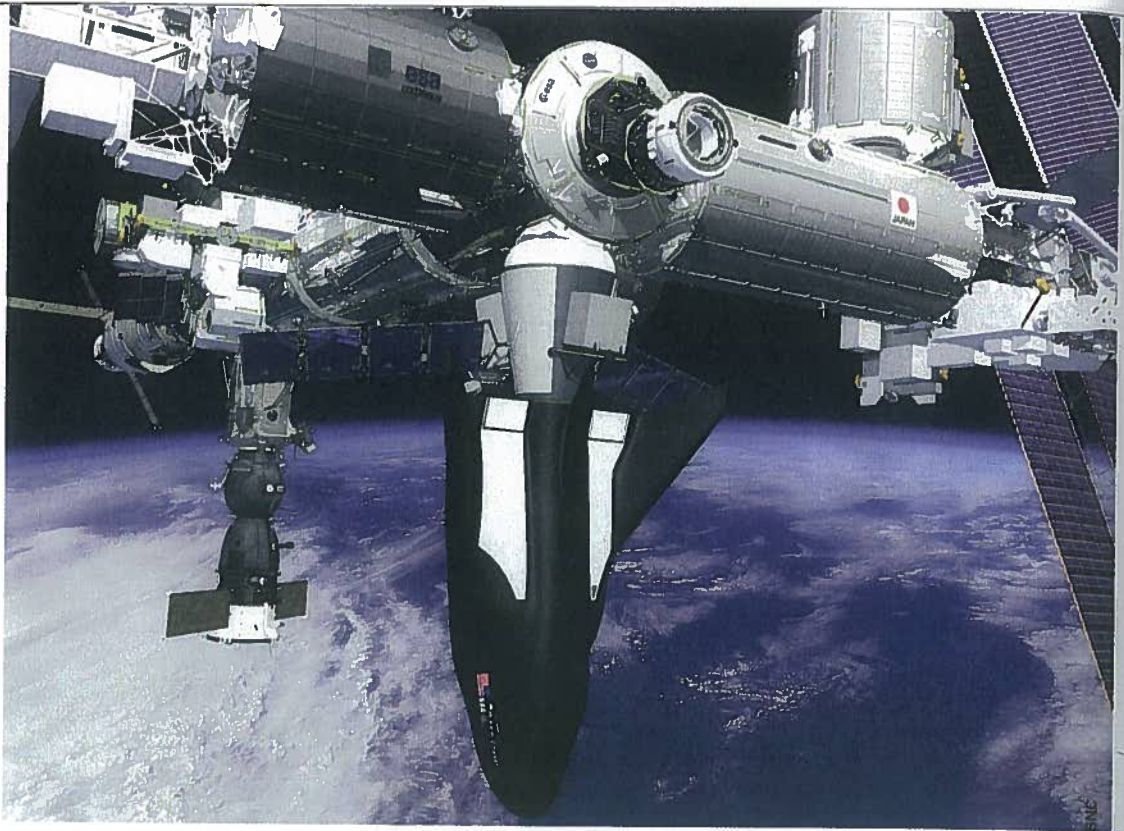
In order to make the programme more accessible to nations without a highly developed space industry, UNOOSA will offer technical support to countries that lack expertise or experience in developing space science experiments to fly in microgravity.

Support might include activities such as assisting selected entities in further designing their projects, training researchers, or developing university curricula. These actions are in line with our effort to define innovative and effective approaches to capacity-building, as mandated by the Committee on the Peaceful Uses of Outer Space (COPUOS).

By developing and implementing a research project for the United Nations Dream Chaser mission, countries can also gain benefits outside of just the mission. We expect our efforts in building capacity in this way to have long-term impacts, especially in space-related science, technology,

We are working with Sierra Nevada Corporation to explore innovative funding mechanisms to further assist selected countries in defraying the costs of their participation

► Graphic showing SNC's Dream Chaser spacecraft and cargo module attached to the ISS.



engineering and mathematics (STEM) education programmes, and that these results will flow to the wider economy as a whole.

Countries selected to provide mission experiments will be asked to pay a pro-rata portion of the mission cost, based on the resources required to host the payload and their ability to pay. In addition, we are working with SNC to explore innovative funding mechanisms to further assist selected countries in defraying the costs of their participation, so that this mission can really enable inclusive access to space for all.

Dream Chaser

Sierra Nevada Corporation's Dream Chaser is about the size of a regional jet and is expected to accommodate about 20 to 25 laboratory stations. It is the only reusable, lifting-body, multi-mission spacecraft capable of landing at commercial airports or spaceports that currently accommodate large commercial aircraft.

Dream Chaser is a safe, affordable, flexible and reliable system capable of crewed and un-crewed transportation services to LEO destinations. SNC is currently working with airport and spaceport authorities in pursuit of the necessary licenses for missions.

After successfully completing early test flights with NASA, Dream Chaser was recently selected to provide cargo delivery, return and disposal services for the ISS under NASA's Commercial Re-

supply Services 2 (CRS-2) contract. Dream Chaser has successfully completed its first milestone under this contract and is now being prepared for the next round of tests. Its first flight to the ISS is planned for 2019.

Wider framework

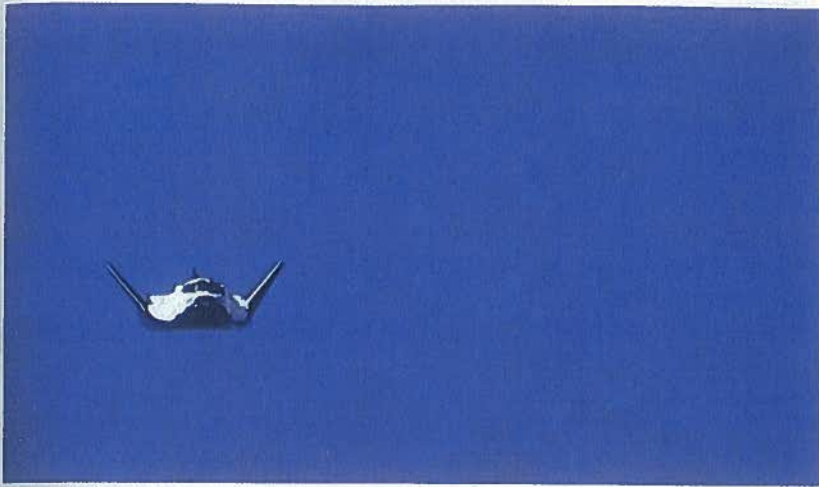
As well as being part of our HSTI, this exciting initiative with Sierra Nevada Corporation for the first United Nations Dream Chaser mission is also part of a wider UN framework focused on the future of international space cooperation - UNISPACE+50.

UNISPACE+50 will be a special segment of COPUOS in June 2018 to mark the 50th anniversary of the first UN Conference on the Exploration and Peaceful Uses of Outer Space.

This will be an opportunity to build a new concept of space governance that aims at achieving the 2030 Agenda for Sustainable Development, including the 17 Sustainable Development Goals, and is based on the peaceful exploration and uses of outer space. UNISPACE+50 will bring together space actors from around the world to consider issues based around four thematic areas: space economy, space society, space accessibility and space diplomacy.

Capacity-building and access to space for developing countries, through initiatives like our partnership with SNC, will be especially considered under the 'space accessibility' pillar.

The mission is innovative and means traditional boundaries between the different space sectors are no longer as definitive or limiting as they once were



▲ Dream Chaser during a flight test.

We want to make sure that space technology and applications are used to bring concrete benefits to humankind while, at the same time, ensuring that space remains sustainable.

Space accessibility is essential because it keeps space from being a producer of economic and social inequality. It contributes to equal distribution of opportunities, broadens economic gain, fosters research and innovation, and supports decision-making processes on the basis of accessible and transparent data.

Dedicating an entire microgravity mission to United Nations Member states, many of which do not have sufficient infrastructure or financial backing for their own space programme, gives more countries access to space and the ability to use space technology as a tool for the achievement of the Sustainable Development Goals.

Diplomacy

Our partnership with SNC on the United Nations Dream Chaser mission is also relevant to the topic of 'space diplomacy', which is defined as constructive and knowledge-based cooperation in using space technologies and applications to address common challenges facing humanity.

It is also important to note in this context that private actors such as Sierra Nevada Corporation have a key role to play in addressing global issues, especially in line with the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals; this role was affirmed in the Dubai Declaration that emerged from the recent High Level Forum on space as a driver for socio-economic development.

Our partnership with Sierra Nevada Corporation is a good example of how public/private partnerships in the space sector can be beneficial to all. This mission is innovative because it acknowledges that

Space accessibility is essential because it keeps space from being a producer of economic and social inequality

Dubai declaration

The High Level Forum on space as a driver for socio-economic development was held in Dubai, United Arab Emirates, from 20 to 24 November 2016.

It brought together more than 100 participants from the broader international space community to identify ways to harness space technology and applications for socio-economic development.

After five days of presentations and discussions, participants made concrete recommendations in the form of the Dubai Declaration, outlining how to move forward in utilising space for development and assisting states to attain the Sustainable Development Goals.

The Declaration will be presented to the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space in early 2017. The Declaration is available on UNOOSA's website at <http://www.unoosa.org/oosa/en/our-work/hlf/first-hlf-meeting.html>.

the traditional boundaries between the different space sectors - security, commercial and civil - are no longer as definitive or limiting as they once were.

Uniting effort

Going forward, common issues and concerns in the space arena will have to be considered in a collaborative approach that unites the efforts of the space sectors. And, importantly for UNOOSA and UN Member States, all players, including the private sector, can be key contributors to global sustainable development.

We believe that our partnership with SNC on the United Nations Dream Chaser mission will achieve these goals. Furthermore, by giving emerging space nations cost-effective access to space and the opportunity to conduct research that cannot be done on Earth, we are fostering space innovation and exploration

This mission is an exciting endeavour, and we at the United Nations Office for Outer Space Affairs are looking forward to bringing the benefits of this partnership to many all around the world. ■

About the author

Simonetta Di Pippo has been Director of UNOOSA since 2014 and was previously Head of the European Space Policy Observatory at Agenzia Spaziale Italiana (ASI) in Brussels. She also served as Director of Human Spaceflight of the European Space Agency from 2008 to 2011, and Director of the Observation of the Universe at ASI from 2002 to 2008.