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AI FOR GOOD GLOBAL SUMMIT
CELEBRATION OF THE WORLD TELECOMMUNICATION AND INFORMATION SOCIETY DAY

MAY 17, 2018

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Samantha Cristoforetti will soon return from earth after a five-month it stay on the international space station. Samantha is an experienced pilot with a background in aeronautical science and engineering. Preparing for the first space flight meant many months of intentionive training spanning the world, the programme equipped her with the skills she would need to undertake a long duration mission in orbit. On November the 23rd, 2014 Samantha stepped on to the launch pad with two crew men. 9 minutes after lift-off, the capsule was in orbit. Less than 6 hours later, it docked with the ISS, 400 kilometers above the earth. Samantha was welcomed by the three resident crew members who had said good-bye to another astronaut two weeks earlier. As expected, Samantha's life in orbit has been extremely busy as the 8th astronaut to undertake a long duration mission she's responsible for continuing the programme of European and international experiments in micro gravity. Most of the experiments have far reaching implications back on earth. Inside of the quest air lock she's taken part in the airway monitoring experiment which involves breath testing for the presence of n ICT ricoxide showing the dust on the astronauts lungs and tests a procedure for doctors treating lung

conditions. As flight engineer, Samantha has been responsible for maintaining scientific and operational equipment. Here she is seen replacing a smoke detector in the bio lab. As a trained space walker she's provided support to crew mates is that were assigned taskers outside of the station. On February 14th, the 5th automated transfer vehicle undocked from the I.S.S. and Samantha oversaw the process, the poignant moment as it marked the end of the station's ATV programme. Elements of the huge cargo vessels will soon make an appearance again as part of the NASA's spacecraft.

>> Together with NASA astronaut Samantha was responsible for capturing the space X dragon, a vessel delivering experiment equipment to the crew including -- an important part of her role in orbit is education and the future mission, it has been no exception. She has phone to students from space, encouraging them to learn about the science activities and hopefully inspiring the next generation of astronauts and researchers. As Samantha Cristoforetti is ready for the flight home, two more European astronauts are preparing to fly later this year. Maximizing the return from its investment in the largest ever out post in space. (break).

>> Excellencies, ladies and gentlemen, can I ask you to take your seats as the celebration is about to begin.

Thank you very much. Excellencies, ladies and gentlemen, it is my very great pleasure to welcome you here today on 17th May, this day we celebrate world telecommunication and Information Society day and we truly have a very exciting programme for you. Before we kick off our programme, we have a few words from the United Nations Secretary-General, a video message.

>> World telecommunication and Information Society day, which also marks the birth of the International Telecommunication Union. I commend the ITU for the critical role it plays in narrowing the digital divide and connecting people wherever they are, whatever they mean. When you look at an increasingly digital future I welcome your focus on exploring how AI can accelerate progress towards the Sustainable Development Goals. I also commend you for inviting pioneer astronauts to share their experiences about tackling new had frontiers. They're an inspiration to our efforts to extend opportunities for Women and Girls in technology. Emerging technologies has the potential to empower people and transform how we transmit knowledge, increase agricultural yields, harvest energy, treat diseases and so much more. Let us keep working together to ensure that this technology serves the global good of all humanity.

Thank you.

>> Thank you. It is now my great pleasure to introduce the Secretary-General of ITU, Houlin Zhao, to tell you all about world telecommunication and Information Society day.

>> HOULIN ZHAO: Still feels like we have seats in the front row, people in the back, they can come to the front row here.

>> HOULIN ZHAO: Excellencies, dear colleagues, today is a very special day for ITU and to all our members around the world. Today we celebrate world telecommunication and Information Society day, 2018 and our theme this year is enabling the use of Artificial Intelligence for all. ITU was born on 17th of May, 1865. ITU has been at the center of advances in communications for over 150 years. With technologies ranging from the telegraph, telephone, radio, broadcasting, television, satellites to the Internet, mobiles, 4G, 5G, Cloud computing, the Internet of Things, deep space communications and Artificial Intelligence. Every year since 1969 ITU members and partners have organized the events across the world on 17th of May 20 recognize and promote the positive role that Information and Communication Technologies can play in our societies and economies. At this ceremony today we have three special sessions. We will pay tribute to someone who has contributed to the work of ITU for 50 years and we'll celebrate the very first issue of the new ITU channel, ICT discoveries, but first we will have a very special programme to promote the women in ICT, AI and space activities. We will have a chance to meet and hear from two female astronauts and one female space explorer. ITU and space have a long, rich history which the world, global regulations, standards for radio systems of key importance for earth observation, climate monitoring and space missions. We started to allocate the radio frequencies for space communications in 1963, just six years after the inaugural flight. Without a dedicated structure for space missions, how would we communicate with astronauts, with spacecrafts, how would we conduct a scientific research and if you want to see the aircraft, spacecraft, if you want to talk to them, if you want to see the results of the science programs, we have to make sure that the spectrum will guarantee all of this communication channels. ITU has contributed to the success of space missions, including those contacted by our special guests here with us today. We're now on the path to open up new opportunities for space activities during our world telecommunication conference, world radio telecommunication conference next year.

In China, there is a saying, women hold up half of the sky. The first women to fly into space 65 years ago, she once said that a bird cannot fly with one wing only, human space fright cannot develop any further without the active participation of women. We're pleased to see many women participate in the the

space missions. Today we're joined by three extraordinary women, Liu Yang, the first Chinese women in space, Samantha Cristoforetti, she broke the record for the longest space mission ever completed by a woman, she had stayed in the sky, she had stayed in the sky for more than half a year, our moderator, Anousheh Ansari is the first female private space explorer. I also want to pay special tribute to another female astronaut, Yelena Kondakova who was the first first women to enter the cosmonaut programme with male classmates in Russia, she actually traveled to Switzerland yesterday but unfortunately for some reasons today she could not join us.

We also thank her for her agreement to ep join us today but for very special reasons unfortunately at the last minute she could not come to this stage. These women show us that math, science, engineering, technology can make you reach for the stars. That's not all, and if we reflect on this potential of Artificial Intelligence to accelerate the United Nations' SDGs, our special guests can she had new light on the meaning of Artificial Intelligence and tech for good and for everyone, in particular the Women and Girls. Please join me in welcoming three of our finest space explorers, Liu Yang, Samantha Cristoforetti and Anousheh Ansari.

>> Thank you for joining us for this special session, and it is my privilege to have two wonderful colleagues here on stage that will share the experiences and stories with you. We'll start with a quick presentation and I'll share a bit of my story and how I became interested in space and my wonderful experience of flying to the international space station and we'll hear from our colleagues here. Can I have the presentation.

I was born a long, long time ago in a country far, far away in Iran. I grew up actually with this passion and vision of going to space. I fell in love with the stars at at very young age. All I wanted to do was to become an astronaut. I even drew this picture, showing it to everyone in the house, I told them this is how I'm going to space. Of course, as you can imagine, a young girl in ire ran, no space programme, nobody believed me. I like to show people that they're wrong about me all the time. Not only do I have to go to space. I had to go in a rocket that resembled my drawing. You can see that I was able to predict the future! I believe in imagination. I think human beings have an amazing gift that's very unique to us and that's our imagination, that's what allows us to actually create things that do not exist, you know, create spaces, invent things. It all starts with a spark of an idea that we get and it may be an inspiration we see by seeing something out side or watching something on TV, I was a treky, I loved science fiction

books and soon enough you see yourself in those positions and in those -- in the heros in the book and you make it come true. I came to U.S. when I was 16 years old and didn't speak English, didn't have money. I knew I wanted to become an astronaut. I found out that it is not going to be possible for me. I wasn't even a U.S. citizen. I took a different path, became an engineer, an entrepreneur, eventually many years later I sold my company and became involved with a project to make my vision happen because when I looked around for the star fleet academy, there was no star fleet academy. A long time had gone since the first journey in space but the space was not open to the public still. There was no star ship enterprise to take me to galaxies far, far away.

I decided that I'm going to do something about it. When we sold our company, I had the privilege of meeting an amazing individual called Peter deamandus with a vision and a dream of a competition. A competition that would ignite, you know, innovation in space and open it up to everyone, Democratize it. I became a partner with him and became the title sponsor of the Xprize launched, it was a prize to open up space for everyone. It was to reach the edge of space about 100 kilometers and to do it twice within two weeks. There were 26 teams that exceed for the 10 million-dollar prize and over 100 million was spent to win the 10 million. We figured, you know, this is a fantastic idea and if it worked in space it could work in other places. Not only did it work, but it worked in manners we never imagined, and right at the time when the prize was won Richard branson stepped up and turn it into a business, Virgin galactic was launched, they have done successful test flights, even this year, we may have the first commercial passengers experiencing the flight to edge of space. Because of a lot of regulatory changes, policies that we change, the awareness we created, 100 billion industry, it was generated and you have companies like space X or blue origin right now that are becoming partners with the government space agencies and really advancing innovation in space much faster than it has ever been seen before. We didn't stop with the prize, we have another prize related, space related prize that's ongoing, the Google LunarXprize even though the Google sponsorship ended just a few months back, because there was so much excitement in the teams, we're continuing the Google donor X prize and it will be a donor X prize for us that will allow other sponsors to step in. Until then, it is actually ongoing and the teams are continuing to build their rovers for a moon landing and we're very excited about the technologies that are developed for this prize.

We're very, very proud to announce a recent partnership with NASA and in the frontier development lab and in

collaboration with looking at prizes around space resources and you can learn about this at the NASA frontier development lab website.

I'll have the session for you later in Chinese. You know, we have been talking about AI and technologies and we had our colleagues that talked on the trust in AI track and a lot of these conversations around technologies sometimes outside of the walls, especially creates fears because it is something we don't understand and human beings, natural response to new things, things we don't understand, we cannot predict the sphere. The reason we're here, having a session for AI for good, it is to overcome the fears and not allow fearses to derive our decisions, but to actually let hope drive our decisions and that's why you want to use AI technology, space technology, use everything about disposal to create a the beautiful future and with everything at our fingertips, I think that's possible and it is just we have to use our imagination and that's why we're here today. I'm especially here today because I want to see a lot more young girls interesting the field of technology and stem and become engineers and astronauts and people like a Syrian refugee with dreams of going to space, and I hope one day her dream will come true.

I would like to share with you a video that will take us on the journey to space with me and then I'll pass the baton on to my colleagues.

>> It was something that I wanted to experience for myself. The mystery and unknown out there, they ever been drawing me to space. The universe, it is calling me. This is the winning of the X prize flight.

>> The title sponsor of the X prize. Congratulations on today's flight!

>> I'm not afraid of risk. This is a risk worth taking. Having the view we saw today on the monitors of space ship 1, it is an experience that's out of this world and I would do anything to go get to experience that.

>> When we fly, they make a seat liner that is casted to your body. This is the casting, this is the training area. The 0G flight. I had family members that came and joined me on one flight. These are my crew mates when we were getting ready for a final exam. The morning of the flight, after going through to the preparation you board the bus and you actually go to a rocket, and we have the capsule, just reminiscing, going through here. It was a difficult experience for my family and all the astronauts family to see loved ones go on the missions. They're all very supportive in every aspect of the work. On my mission, it took two days in the capsule to dock to the space station. This is the dock actually. There were three crew mates waiting

for us, making us feel at home.

>> The second visit to the international space station. For the first time I would see the earth as a really beautiful glowing blue globe in the background of the universe. So one fun fact about being in space is that because you're floating around, there is no concept of the ceiling or the floor. You see equipment all over, as you change your orientation, the floor becomes the ceiling, vice versa. This is my sleeping bag right here. Right by the best view from the world. The view from space station is amazing, from up here, everything is peaceful. You can't see the borders, you can't see different rice, religions, you just see one earth, very peaceful and beautiful rotating and I think that's part of the reason they wish more and more people would be able to experience this firsthand because talking to the astronauts they have a different perspective on life and how important it is for us to do everything in our power to preserve the only home we have in the universe.

Thank you very much. So we have Liu Yang, the first Chinese female astronaut that flew to the Chinese space station and she's a pilot and major in Air Force and we're so lucky to have her here with us.

>> LIU YANG: Thank you. Ladies and gentlemen, good morning. I'm Liu Yang. It is my good honor to attend this conference and share my outer space experience. Six years ago a space shift which was developed by China was launched with three crew mates aboard, including me. It is the first time we performed manual rendezvous and docking. We started a meaningful and memorable tour of space exploration. About 10 minutes after lift-off, we were in the scheduled orbit and I'm sure I will never forget this long, long ten minutes featured expectations and excitement. Though I had been well prepared and imagined it a thousand times, the image of space, I was still deeply astonished. I could hardly describe its beauty because words fail to express how beautiful and miraculous it is. Looking back on earth from 340 kilometers away, the planet while human and other creatures have lived for millions of years, it looks so glamorize. We have the oceans with deep shallow blue and I saw the clean lens and the long coastline, this is our beloved homeland earth who deserves our love, cherished, protection. Sure, the beauty of our planet is quite beyond words and these photos and videos, they were taken in space, at my first sight of the earth from space, I couldn't help shouting, the earth! It is round indeed! The unique environment not only challenges our space tolerance, but also brings a unique experience in the meantime without constraints of gravity I felt like a free fish swimming in the ocean of

space. Micro gravity sat all of this free, everything seemed alive, floating and flying. In Chinese fairy tales we have a monkey king who can travel 1800 leagues with a single thought. During my flight, I had a dream in which I transformed myself into the monkey king flying in the Clouds, turning it out freely, that was amazing.Human exploration of space has never stopped since 1961, however, we should note that space activities are still highly risky thanks to the rapid development of Artificial Intelligence we can anticipate that AIS could be very helpful in future human space flight missions. Human astronaut will never be replaced since they are still the essence of human space flight. We believe that the essence of human space ex he is more rations will be significantly improved with assistance of AI astronauts. Space exploration will never stop since human spirits of exploration, they never come to an end. We are delighted to see more females join us and play a vital role in the exploration of the universe. We will always come back with that further and into deeper space with astronauts and scientists from all over the world, men and women. It has been placed on the Agenda in China to build a new space station along 2022. We have started the selection of new techbots and are looking forward to a closer collaboration with international actors in our space station. Welcome. Thank you. I would like to invite Samantha Cristoforetti to join us. She's the first fee mall -- the first female Italian astronaut with a record of being in space. Samantha.

>> SAMANTHA CRISTOFORETTI: Thank you.

>> SAMANTHA CRISTOFORETTI: Thank you for inviting me here today. Ladies and gentlemen, it is a pleasure and an honor to be on this panel. I know we don't have much time so I will make use of my privilege of being the last speaker to be extremely brief because the two ladies that spoke before me, they have so eloquently already expressed many other things that of course, I have experienced and have had in my astronaut career as well. It is funny, I don't know if I ever told you this story, but several years ago I read her book, she's an author, my dream of stars, I believe it is the name of the memoir and she was telling her story and briefly outlined today in more details about her upbringing in Iran, her life story especially when it came to her childhood in Iran all the time, you know, every page I was like me too, me too! Same for me! Me too! It was so funny how I grew up in Italy, she was in Iran, and somehow our childhoods were so similar, it was an amazing experience. I'm a European space agency astronaut, I was born, went to school, grew up in Italy, in a tiny village with a beautiful night sky with no light pollution. The sky, it was a powerful presence like other, I was a science adventure fan and I was adventureful

and wanted to go to space. I never was told I couldn't, I never had any doubt -- I knew it would I can a lot of luck, because there is very few people becoming astronauts in Europe in a generation, in my generation, it was six all over Europe. It takes a lot of very fortunate circumstances but I think I'm one of those girls and young ladies who were never told that they couldn't do what they wanted. I was pretty confident that if the circumstances allowed it I would be able to do it. My path went also through engineering status, I studied mechanical and then engineering at the University of Munich, I chose from the very beginning to have an international education during my University studies and I also spent time in France and Moscow. Of course, I knew the Russian friends are a major partner in the international space station. It wasn't by chance, of course, that I chose to go to Moscow for the thesis, I spent a year there. I had a chance to come back to Italy and join the Air Force, I became a combat pilot for the Italian Air Force, I was at the very beginning of my operational career when this once in a lifetime opportunity came up to participate in the astronaut selection of the European space agency and so became an astronaut in 2009 together with five other colleagues of diverse backgrounds, you don't have to be in the military, don't have to be a pilot, some of my colleagues, three of my colleagues, they're civilians, they were and are civilians, a couple of them had no flying experience at all and one pure scientist, another pure engineering, so there is opportunities for very diverse backgrounds in the field. Then I started training, I trained for several years around the world. I had a suitcase packed and spent time in the airports because when you're assigned to a mission to the international space station we call it like that for a reason, it is this amazing infrastructure in lower earth orbit as big as a football field and this big Laboratory where you can do research in being weightless and it is interesting for a number of scientific research disciplines in physical sciences and in life sciences.

It is called international, it is the product of a big partnership between different space agency, of course, NASA, Russia are the major partners, and as Europeans, we have a major contribution both in the European space agency and in some cases, also through bilateral contributions of the single countries, my country, Italy, it is very, very active in that sense. We have the Canadians and the Japanese. You have an astronaut in training, you're basically going to all those different places all the time. You may be three weeks in Houston and two weeks in Russia and one week in Japan and you are bouncing around the continents for about 2.5 years. Finally for me also, that moment, it was shown in the beautiful video,

it came about, the launch to the international space station, I was up there a long time, rotations are usually 5 and a half months and when we were close to our return there was an accident of a progress resupply ship. It is a bit counter intie active, you imagine a cargo ship doesn't come, you don't have supplies, you have to come back earlier, in our case, because of the way things played out, we had to actually stay a month longer which I thought was great. We ended up staying almost 7 months on the space station doing a number of investigations, there is typically 700 investigations in the long-duration mission, I supported space walks, was at the controls of the robotic arm, you know, it is physically what astronauts do in the I.S.S. world, we're a little bit the jacks of all trades and we're only six up there, the Russian colleagues, three, they take care of the Russian operations on board and all of the the American, European Union's, Japanese, Canadians, they take dare care of the rest of the station and we have to do everything. That's why the training is so long.

I look forward to going back to station probably, probably sometime in early next decade, it would be my turn again. We're planning to operate space station at least until 2024, maybe even further beyond that. We're looking into what we call beyond lower earth orbit missions. That will be a first step, building a small space station in a very peculiar orbit around the moon which will allow us to test our technologies and also operational concepts for missions which are not so close to home. Space station, it is 400 kilometers, it is very close, we have robust concepts and technologies, when you go further away, things are a bit more complicated. Then to the orbit, it is chosen in a way that it provides a relatively easy access to the moon surface, that would be the next step and eventually after that, but then it is a quite by the longer term on to marrs. Artificial Intelligence is instrumental for all of that. Of course, AI is pervasive in everything that we do in space these days and I think that many of the tracks that were presented today, they were proposed in projects that rely heavily also on satellite data so of course isa, European space agency, they're interested in leveraging the potential of AI to make that data more useful. We have a number of earth observation platforms in orbit and it is of interest to have the system in an intelligent way it is able to fuse all of that data and make it usable for different applications for European and world citizens. At the same time, if I talk about things that are close to my heart, it is, of course, human exploration of space and the AI, it is going to be extremely important for that as well because we all understand that a lot of the human mission, especially on the surface, talking moon surface, Mars surface, they're going to be

proceeded by what we call robotic precursor missions. Autonomous robotics, autonomous navigation, even the ability of a moon surface rover to autonomously, intelligently pick a route, pick a sample which is interesting from a geological, scientific investigation point of view, all of that would be extremely instrumental in making space exploration effective and affordable. Sometimes people ask me why haven't we done that before, we went to the moon 50 years ago, why talking now about maybe getting back in the next decade. It is not that much of a question as technology but the question of the price tag and all of the political implications that go with the expensive programs. The more we leverage technology and again AI, it is going to be key in that to make this programme efficient and affordable the more likely it is that it will actually happen. Thank you very much.

>> Great.

I have a few questions that I'm going to get started on and then we'll invite the audience -- the audience for a few questions as well.

Let me start with you, tell us a little bit about what inspired you to become an astronaut, what challenges you faced when you were on space station? I think firstly, speakers of -- before I did this, I was an Air Force pilot for 10 years. At that time I thought myself closest to the sun and later I realized only others could be closer to the sun, that's why I wanted to become -- I said I wanted to be a tikonaut. I had so many cure Rosstys, I want to see with my own eyes, to see this vast space, what kind of scene, a vision it is really like. That's why.

>> There is no -- I'm not aware of any special recommendations specifically for women, the path is really the same for everyone. Again, things change fast. We are in a very dynamic environment now when it comes to access to space especially the world orbit, there are lots of companies in the U.S., some have been mentioned about who hoped to be able to offer in the near future at least some orbital flights and actually some of them are looking into commercially available orbital flights and potentially building platforms in lower orbit which are sold on the market. I have no idea whether that makes sense from a business perspective, it is completely out of my field of expertise, but it may come. The opportunities to go to space will multiply, will be many, many more and the type of professional profiles that are sought after may not be the same. It is an exciting time where opportunities will multiply to go to space or at least there is a chance that that would happen.

If we're talking let's say the traditional astronaut hired by a space agency to be a professional astronaut for a certain

number of years and have a clear in that way, typically there's two fields where we recruit, which is the stem, science engineering, math, medicine background and the aviation background, pilots. Or you could have a mix of the two. In my case, I mixed, I studied engineering and I went on to become a pilot and I had a short career in that, if you go straight to become a pilot, then, of course, it is expected to have a longer career in that, become a test pilot and can show a strong aviation background, others have a pure engineering and science background, what I will say, to people that chose the latter, so maybe becoming scientists, really good scientists, engineers, they had the dream of becoming astronauts, I would try to add to the curriculum something which I would call operational. Something that shows the recruiters that you're comfortable also outside of your lab or outside of working in front of the computer because that's really important. I give you two examples. The two colleagues of mine selected in 2009 who were not pilots, one of them, he's a scientist and he had in his background -- well, basically, when a volcano explodes and people start running away from the volcano, he starts to run to the volcano, he was a Geo physicist and he had that in the background, he had a number of expeditions and it was a classic analog of space light. The other one, pure engineer with PHD in engineering, but had spanned a.

In of years on oil platforms, offshore oil platforms, again, confined environment, potentially dangerous, you go to follow certain procedures, you have to be able to work with people that are there with you, you know, there is no escapes, very similar to space life. If you don't want to go in aviation, you go in science and engineeringingser find something that you want to do to show that you're capable of handling yourself in environments like that. Otherwise the recruiters will not be able to say whether you can be trusted in such an environment or not.

>> Thank you.

If you're a researcher out there, just go find something really, really dangerous and adventure risk factors to do. Let me ask you, when you went on your space TRIP, what do you find surprising, what was challenging for you? I think the most astonishing thing, as I said, in my presentation, that is the first time, looking back on to the earth, you have the real kind of a contrast which is big, what is small. It is quite shocking, quite unforgettable type of an experience. We have realized that the earth, it is our mother home and then another challenge, it is the kind of loss of gravity. This is quite physically a kind of challenge when -- as astronauts, when -- in this space, you might have this going to sickness, space

sickness, I think this is a big challenge. You need to have the stamina, you have the physical strength, you have to overcome the difficulties. Another area, it is the the complete difference between the working environment, between the space and what we do on earth, for example, in the year 20222 in China we'll establish our own China space which will require us to stay there for six months or longer. This is even much bigger challenge for the physical strength and the psychological stamina of the tikonauts and for myself, during the flight, my biggest challenge, it was to overcome the difficulties and the hardship of the gravity, the loss of gravity, but for future, I think the challenge if we talk about China space station, it might be more challenging, you have to overcome this by way of training on the ground.

>> Loss of gravity is something that our bodies, our minds, everything has to get used to.

>> It is fun!

>> It is fun! I was surprised how quickly, you know, you can switch and get acquainted with just living in space.

>> You talked about the importance of technology in the future of space exploration. Can you maybe use some examples, some of the things that you feel is most important in the future of space exploration in the next five, ten years, beyond. Has there been a new international space station designed for example?

>> Of course, whenever we talk about human space flight we always talk about programs in cooperation. It is very difficult for a single country, but for maybe China to afford human space programme on their own.

In the last years, there's been a convergence among the traditional partners and also including new partners like China about thinking what should the next steps be, how are we going to approach exploration beyond the earth of orbit. There is a convergence about building this habitat that I discussed about. For a long time, it was deep space gateway, now they change the name, they may change again, it doesn't matter. They're very concrete status now out there to define the architecture of the first modules of the habitat that will have sort of like a service module, they call it power and propulsion module and an intermediate small model to have added capabilities and a habitant module, its will be small, not like the space station now but a start, it will be on this very highly electrical orbit around the moon but it will take about 7 days to go around the moon and on one side, it is very close to the moon surface, a perfect place to land.

Technologies, well, of course it is really -- I can't stop saying that. To me, a sustainable space programme, it is

affordability, making it sustainable for an economic, from a budget point of view, of course, reducing the cost of access to orbit, it is extremely important. Reusability of rockets, it is this new hype and just a few years ago people thought it was impossible and now, of course, history has shown that it is possible and I think a lot of could you terrible techniques from the Artificial Intelligence toolkit, they have been instrumental in allowing this rocket stage to structurally fly themselves back to earth or to the ocean and basically pinpoint the landing like that because of course they have to be able to react to an unexpected atmospheric conditions and that you can only do with Artificial Intelligence techniques.

Generally speaking, when we talk about exploring, going further out, not space, on the space station, we talked about on a Skype call, it is very close, the delay, it is very small, for talking about the surface of the moon, it is already a difference, more significant delays, trying to control the realtime rover like navigating it around, like on a video gape from earth, it.

Abouts complicated because the delay starts to become -- to have an impact. If talking about marr, even more so. That's completely impossible -- Mars. Autonomous navigation, it will be important very Mitch out of the AI toolkit.

If talking about long missions, you need to be able to have technology which is extremely robust. A lot more robust than we have on the space station now. On the space station now we have the privilege of having space, spare parts for everything, spare units, it is not working on a small habitat or small spacecraft to Mars and we need to find new solutions, new manufacturing solutions, there is a lot of things that there is hype about, including this add active manufacturing, the fact you don't need to bring the spare parts, you may be able to send the file and print it and just have the raw material. Maybe even recycling the raw material, you know, when you're done using that and reuse that. That's one of the things that we look into.

When talking about surface missions on the moon, on Mars, a key question, it is how much can we actually get from the land, living off the land, how much do we get from this regulator, it seems simple but when you look into it, it has in it resources that could be potentially harvested. Again, it is a matter of technological development, surveying the sites, understanding exactly what's available and then, of course, the extraction technologies.

Of course, there is a big topic of autonomy. You need to be able to take much more autonomous decisions. Right now everything is space station, it is ran from the ground, every decision that affects the spacecraft is still on the ground, the

flight controllers, it is a lot more autonomous for the deep space missions, they'll need to be able to use the intelligence of AI systems to help make decisions and to automate the decisions. The vehicle needs to be intelligent, needs to proceed whether we're going to a failure, something is progressing towards a situation and take automatic actions.

>> Regarding the comment on cooperation between the countries, I would like to add something, in 2020 we'll build a new China space station. It is more like common platform, international platform. We're very willing to would the operate with international experts and professionals, just like Samantha not long ago, she went to China to learn Chinese and for us, we were eager to learn English. We welcome greatly everybody to join our work station.

>> Last year for the first time, non-tikonauts trained in China and a German colleague of mine, we actually went to China, we did sea survival training with I believe 12, 15, I forget, from the Chinese team and it was a very, very big step I think towards cooperation and who knows, maybe when flying on the Chinese space station --

>> I look forward to that.

>> As well, we're actively promoting the training programs to train others. .

We can have one, two questions from the floor. If you don't have a comment, right there, the lady in the back? You have to turn on the mic.

>> I will ask the question, I know you're the first female tikonaut and one of the few internationally. Firstly, it must be the case that your family, friends, they may think it is too risky, they might think it is kind of a questionable mission. You still put on a brave face and then you succeeded. What is the kind of suggestions you would put forward for those different challenges and questions.

>> I think once you have the determination, you are just to determine that you'll carry on, do not feel influenced by others so if you're brave enough, consistently enough, if you love the mission enough, you will surely reach your dream. Thank you.

>> Any other questions? Yes.

>> Thank you. This was inspiring and interesting for all of us.

What I would like to ask, you have been very much excited to go there. What was the excitement to go back? What was the feeling when you have to go back?

>> I was very depressed and I didn't want to come back!

>> How did you feel to come back?

>> It was similar for me. I have been up there for a long time, but still it is not -- I mean, it is hard to come back and

to be very pragmatic, it is also for very simple pragmatic reasons which are -- you get used to life up there, it is a boo autonomous navigationful life, in a way, it is a simple life, you're in a confined environment, you know every day what exactly to do, somebody else will plan your schedule, you are perfectly trained to do everything that you're asked to do and in normal life it is not like that. Life is unpredictable, complex, life entails a lot of interactions and you're never perfectly trained to do everything that you're asked to do in real life.

If I have to be honest, I think part of it was like leaving space, the beautiful view from the window and part of it, it was just -- I don't want to go back to this complex real life on the ground. Thank you. We're out of time. It was a privilege to be on this panel with all of you. Thank you for joining us on this panel! Thank you! Thank you!

>> It is now my great pleasure to invite Houlin Zhao to present our extraordinary space travelers with the WTSID reward. Houlin Zhao, would you please present the award to Anousheh Ansari?

Would you please present the award to Liu Yang.

The final award to Samantha Cristoforetti. .

If I can just ask the ladies to join Houlin Zhao, we'll do a nice group photo. This award for world telecommunication and Information Society day is in recognition to the incredible dedication and outstanding contribution and the pursuit of space exploration and to the advancement of technology in the service of humanity. Congratulations.

It is my pleasure to now invite a gentleman who has made an extraordinary contribution to the world of ITU and telecommunications, without him, according to Houlin Zhao, the sky would fall as the gentleman obviously holding up the other half. Please join us on the podium.

>> I would like now to take a moment to recognize an exceptional individual, someone who I'm well proud to call my friend. He had started in ITU activities in 1968 as the deputy of the national telecommunication industry and academia in the former CCITT which is now our Standardization Sector. From the start, this work made a significant impact on the Specific Needs of Developing Countries. This led him years later to be a founding member of the advisory board of the center for telecommunication development which marked as a beginning of a new era in ITU's development work that led to the creation of our Telecommunication Development Sector, ITU-T. ITU launched the dedication and commitment of the involvement whose telecom over the last over 30 years, all of the constructive, you have all of the digital conferences since 1989. You have been valued

and a great dialogue from the first Study Groups and transmission systems back in 1968 to the telecommunication standardization advisory group where you still serve. You are an example for all of us. You have left your mark on ITU's history. ITU is grateful to you and through you, to the many, many experts all over the world who have strengthened the role of our organization and it is more than 150 years. Experts who have contributed to the standardization work on radio technologies, in particular TV technologies since 1948 is still with us. ITU was pleased to present professor mark our award two times in recent decade including the ITU 150th anniversary award. My friend from the United States who has worked with ITU standardization work since 1976, ICT Secretary-General offered him a certificate in 2016 for his 40 years contributions and he's also still with us. ITU highly appreciates the contributions made by all experts from all around the world. As of today, I'm pleased on behalf of the entire ITU family to present this matter for 50 years of continues and fruitful services to one of ITU's most distinguished and respected Figures. Please join me in giving him a big round of applause.

Ladies and gentlemen, dear colleagues, it is honored -- I'm honored to accept this recognition for my long work with ITU which was a real not only pleasure but great experience professional and personal. ITU is really an exceptional worldwide organization that should continue and not only continue but also to be even more influenced in the future development of not only telecommunication but everything related to the development of human society and hope.

Thank you.

Ladies and gentlemen, for the final element of our celebration today, I would like to invite the professor from the ITU journal to join us on the podium.

Friends, ITU has a new journal, ICT discoveries, because the entire history of ITU is mapped by groundbreaking discoveries in communication technology and because we have helped bring the benefit of these discoveries to millions and millions of people across the world, our first issue is dedicated to Artificial Intelligence, a new technology that will help us tackle some of the world's biggest challenges and we investigated the technical but also the social, ethical dimensions in AI. The second issue of the ITU journal, we're turning to data. 2017 itself produced more data than the entire history of humanity. This time, we'll be investigating the data dimensions of modern economies and where innovation can ensure that data proves a force for good. I encourage you all to participate. You have until 29 of June to submit your papers. The ITU strengthened the bounds of ITU with academy, the very

concept of this journal, developed out of ITU academia consultations and there is a new thought that long-term vision of academia will help policymakers and industry leaders prepare for the impact of major breakthroughs in research. It has been a long-time dream of mine to see this journal become a reality. Today I'm very pleased to celebrate this first issue, and I would like to recognize some of the people behind it who are here with us today. The director of ITU's standardization bureau. They have taken the lead on this project.

The ITU journal's editor-in-chief, professor. From the University of China, and our associate editor of Harvard University. And the outreach Chairman of the ITU journal.

Please stand up, please stand up. He's a receiver of five new videos, ITU awarded at our celebration of 150 anniversary for his excellent work on the very famous video coding systems, H264 and nobody can deny that this coding system, this is a very powerful tool that you can use the mobile phone to look at the video messages with all of the technology and he's a key expert behind that one.

Thank you.

The ITU staff as well, thank you. Thank you for supporting this. Give them all a big round of applause.

With that, it is my pleasure to turn the floor over to you for some remarks.

>> Professor: Thank you. I realize I can deliver this speech in Chinese in a very short time but I can do it in English without this but that will take a longer time. Since I realize I'm the only guy standing between you and your lovely lunch, so I'll do that in a short time!.

ITU Secretary-General, Houlin Zhao,ish ladies and gentlemen, good afternoon. As editor-in-chief as well as University professor it is my great honor and privilege to introduce this Journal of ITU called ICT discoveries, on behalf of the whole team we have a gentleman over there and also team members sitting around. Basically I would like to share the experience of this prime example of how ITU and academia are enhancing collaborations towards our mutual benefit. Above you will a, the research, community works in service of the public interests and our main goal, it is to contribute to social good. Academic, research institutes hope to publish their findings as widely as possible and we hope to ensure that our work supports social and economic development in a global basis. We share the ideas with the United Nations and in this journal we see a valuable new opportunity to serve the public interest and make our research known to the public and private sector, decision makers worldwide. The first issue of the ITU journal explored how Artificial Intelligence were influenced in the communication

networks and services, since there is a rapid developing area and we'll sharely revisit this area again in the not so distant future. Stay tuned.

As mentioned, the second issue of the journal will share a strong tie with the first one and will investigate the data dimensions of modern economies. In particular, around how data could act as a force for good. Again, the second issue, it is inviting submissions up until the 29th of June. If you go out, we'll find a table that has the flyers regarding the papers with this issue. We look forward to receiving contributions from the experts participating in this Summit and please also help disseminate this information among your colleagues in this related area.

Please stop by for a chat following the session and I would be glad to share more about this new exciting directions in academia collaboration with you. Thank you all.

>> Excellencies, ladies and gentlemen, we have arrived at the end of the world telecommunication and Information Society day celebration. I would like to congratulate once again our ladies, I hope you find this celebration as fascinating as I did and it is now my great pleasure to invite you all to enjoy a light lunch outside of the Popov room.

Thank you.

Have a lovely afternoon. Thank you.