Ambassador's Statement
International Space Forum for Global Challenges
Trento, October 24, 2016 at 3:30 p.m.

- Dear friends, I am delighted to be here with you today to participate in the first International Space Forum at the Ministerial level.

- As we focus on collaboration between space agencies and organizations with Universities and National Academies, to address global challenges for the benefit of humanity, I wanted to take a moment to express my appreciation for Professor Roberto Battiston, the President of the Italian Space Agency, acting also in his capacity as Vice President of the International Astronautical Federation for Science and Academic Relations, for his leadership in bringing us together today in beautiful Trento.

- Thank you also to the collective leadership and staff of the International Astronautical Federation, the International Academy of Astronautics, and the Italian Space Agency for organizing this meeting, and thank you as well to the Italian Ministry of Education, Universities and Research, especially Minister Stefania Giannini, the local authorities, and the University of Trento for their support and hospitality.

- The focus here today is on Climate Change, Big Data Management and Earth Protection, and those areas offer excellent case studies on the importance of the free and open exchange of Earth observation data and information. NASA is leading by example in this area.

- NASA's Earth Observing System Data and Information System archives contained over 15 petabytes of Earth observation data available for public download in 2015. During 2015 over 1.4 billion science products were distributed to 2.6 million users around the globe.

- NASA is also developing software in support of the White House's Big Earth Data Initiative. These activities include development of open-source high performance geospatial search engines and cloud-ready visualization and analysis systems.

- And NASA continues to build a "NASA Earth Exchange (NEX)" big data

platform for large-scale data analysis and data mining purposes. NASA has put a version of the NEX in the Amazon cloud called OpenNEX so that our international partners can access OpenNEX directly.

- The U.S. National Science Foundation, or NSF, is also is focusing on **"Harnessing the Data Revolution"** as one of its 10 big ideas for future investment. With an increase in the volume, variety and velocity of data, the very nature of scientific inquiry is changing.

- NSF is developing a national-scale initiative aimed at fundamental data science research, research data cyberinfrastructure, and the development of a 21st century data-capable workforce. New government, industry and **international partnerships** will maximize the impact of this investment.

- A theme connecting all of the topics of the meeting today is science, technology, engineering, and mathematics, or STEM, education. The U.S. National Science Foundation works closely with NASA and other science agencies to focus on STEM education "from pre-K to gray," or in other words, STEM education for those of all ages.

- International cooperation enhances STEM education. NSF has a student research program called **International Research Experiences for Students**, where NSF funds a U.S. investigator to send groups of students abroad to collaborate with their international counterparts.

- One such example of direct relevance to this audience is the **Student-Assisted Global Exoplanet Search**, which will train undergraduate students to discover and characterize planets outside our solar system. These students will learn the most important observational techniques from international experts, conduct their own investigations, and develop outreach activities for their local communities and schools.

- While we're here to talk about those important initiatives, I did want to spend some of my time focusing on the "big picture" and talking about the future of global space exploration and the Journey to Mars, starting with the International Space Station, the ISS.

- As President Obama recently said, Space *"represents an essential part of our character -- curiosity and exploration, innovation and ingenuity, pushing the boundaries of what's possible and doing it before anybody else…Last year alone, NASA discovered flowing water on Mars and evidence of ice on one of Jupiter's moons, and we mapped Pluto -- more than 3 billion miles away -- in high-resolution. Our space telescopes revealed additional Earth-like planets orbiting distant stars, and we're pursuing new missions to interact with asteroids, which will help us learn how to protect the Earth from the threat of colliding with one while also teaching us about the origins of life on Earth. We've flown by every planet in the solar system."*

- As we look to the future, foremost among NASA's strategic principles for sustainable space exploration is that of "Continuity of Human Spaceflight." By this we mean the uninterrupted expansion of human presence into the solar system by establishing a regular cadence of crewed missions to cislunar space (that between the Earth's atmosphere and the Moon's orbit) during the lifetime of the International Space Station or ISS.

- The ISS is critically valuable as a testbed for exploration beyond low-Earth orbit, and the societal and economic benefits of ISS and exploration for all humankind are equally important.

- As many of you know, at the end of this year the Member States of the European Space Agency will be discussing at the ESA Ministerial Conference whether to support ISS extension through at least 2024.

- Throughout nearly 16 years of permanent human habitation, including the flight of 17 European astronauts to date, the ISS has demonstrated its remarkable strategic, political, and economic importance to the ISS Partners: the United States, Europe, Russia, Canada, and Japan.

- In addition to the outstanding scientific and technical achievements of the ISS Program, it remains a powerful example of ongoing, positive international collaboration among the ISS Partner nations that has endured steadily for decades, sometimes in spite of broader foreign policy challenges.

- Despite tight budgets and competing domestic priorities, the United States, Russia, Japan and Canada have all taken the decision to commit to supporting ISS operations through at least 2024.

- In addition to ensuring our ability to maximize the scientific and technical return of our substantial investment in the program, this decision positions us to work together on new space exploration pursuits far into the future.

- We hope that our partners in Europe will join the United States, Japan, Canada and Russia by extending our cooperation on this one-of-a-kind research facility in space through at least 2024.

- Our work on the ISS is providing direct benefits for our citizens. These benefits range from water purification and remote ultrasound technology to protein crystal growth and improvements in nanofibers.

- Building on our partnership on the ISS, we will continue to expand our reach beyond low-Earth orbit, undertaking missions of increasing distance and complexity in the proving ground of cislunar space, asteroids, and on to Mars.

- NASA is making progress on the transportation for those missions – the Orion crew vehicle, the Space Launch System, and the European Service Module, which is on our critical path.

- NASA's commercial partners are also making progress on the crew vehicles to carry astronauts to the ISS, and other future platforms in low-Earth orbit.

- The next step on the Journey to Mars is placing habitation and in-space propulsion capability in cislunar space as a means to achieve readiness for human exploration beyond the Earth-Moon system.

- Within these activities, there are many opportunities for cooperation and collaboration.

- Beyond NASA, other partners are making strides in expanding human presence, including important robotic precursors, such as the ExoMars, Hayabusa2, the Luna missions, just to name a few.

- These capabilities and missions are part of an overall plan which will extend human presence in the solar system.

- In addition to such space agency missions, there are an increasing number of space actors – no longer the sole purview of governments, the number of private sector and public-private partnerships are increasing in a growing number of countries.

- NASA's ultimate goal is to send humans to Mars, but how we get there will be an opportunity for fruitful collaboration with our many partners.
- We have a plan to extend humanity's presence into the solar system. It is technically sound and fiscally reasonable.

- This is a journey we are embarking on together; advancing humanity's reach will be a truly global endeavor.

- Thank you