Graduate Address
International Space University
Summer Session Students
Rex Geveden
Associate Administrator
National Aeronautics and Space Administration
Strasbourg, France
September 1, 2006

Thank you Gary (Gary Martin) for that kind introduction. Good afternoon ladies and gentlemen. I am honored to be here today to help congratulate the participants in ISU's summer session, and to share the stage with such distinguished space leaders as Mr. Favier (Jean Jacques Favier, Associate Director, Space Techniques, CNES) and Mr. Wu

(Zhuo Wu, Vice President, China Aerospace Corporation).

At the outset I would like to thank you for having me here today. When I was offered the opportunity to speak here today, I have to admit my feelings of ambivalence. You can imagine how difficult it must have been for me to choose between staying in Washington D.C. in August to sign memoranda, review budgets, and attend meetings or traveling to the beautiful European city of Strasbourg to speak with young people about the future of space and to visit museums and dine in lovely restaurants. Surely you can appreciate the difficulty of that choice and recognize the significance of my sacrifice.

Nearly 20 years ago, Peter Diamandis, Todd Hawley and Robert Richards created this institution to bring people together from all corners of *our* planet and help prepare them to be at the forefront of the great journeys humans will soon take to *other* planets.

Your class, which I'm told represents 27 countries, and for the first time at ISU, the nations of Jordan and Mauritius, is the embodiment of their vision. I applaud all of you for dedicating your time and efforts to your studies here at ISU, as well as to the ideals that this unique institution represents. You are destined not only to be contributors to and perhaps leaders in the space programs of your native

countries, but also leaders in the very noble work of making space exploration a cooperative, multi-national endeavor. I firmly believe that what we all can do to further international space cooperation will lead to greater peace and cooperation here on Earth.

I am told that this summer you have all demonstrated your talents, resolve and commitment through your studies and your participation in projects related to the applications of Earth observation data to resource management, the use of micro and nano-technologies for new space systems, and defining requirements and designs for life support systems for space habitats. These are all important activities from the perspective of NASA's

future missions, and no doubt what you learned this summer will be of great value to you in the future.

Today, I would like to share with you a few thoughts on the nature of the second great era of space exploration, which is now beginning to unfold, and about some of the challenges we expect you to take on as leaders and innovators in space.

Let me begin with a quote from Cousteau. Shortly before the Viking landing, the California Institute of Technology hosted a symposium that addressed the question: “Why Man Explores.” Among the five famous panelists was the famous French explorer Jacques Cousteau who had this to say about exploration:

“*The more I spend time observing nature, the more I believe that man’s motivation for exploration*

is but the sophistication of a universal instinctive drive deeply ingrained in all living creatures. Life is growth—individuals and species grow in size, in number and in territory. The peripheral manifestation of growth is exploration of the outside world."

These are exciting times to be involved in the space business, as we are on the cusp of extending the presence of human civilization throughout the solar system, of possibly finding life elsewhere, and of using space in untold ways in the century ahead to improve life here. I suspect that many of you are like me and can't wait to get up in the morning to be a part of this epic quest.

The space program NASA and other space agencies will be mounting is definitely bold in nature.

In a relatively short amount of time, people around the globe will be able to look up at the moon, and with the aid of a strong telescope, be able to see the glimmering lights of a research station on the lunar surface. At this research station, pioneering astronauts from many nations will be learning how to obtain useful resources such as oxygen from the lunar soil. They will be deploying small antennas on the back side of the moon, which can be linked to form the largest radio telescope ever built, free of radio noise from Earth. They will be engaged in geological exploration of the moon, finally establishing the origins of our Earth-moon system. And other

astronauts, in low Earth orbit, will be readying large spacecraft for humanity's first voyage to Mars.

Enabling this vision will require the world's top scientific and engineering talent to develop new areas of expertise. As some of you have worked this summer on lunar habitats, I hope you will build on that knowledge. We will need many bright people to develop the skills that will enable our lunar and Martian crews to live off the land—to grow food, build power stations, and utilize indigenous resources. In mounting these pioneering missions we will also require that crews learn how to repair spacecraft and systems far from home, perhaps by building their own tools onboard their spacecraft.

The expansion of human civilization beyond Earth will be an international. In this regard, we look forward later this month to our NASA Administrator Michael Griffin visiting the People's Republic of China to learn more about that great nation's space capabilities. And already, NASA is working with experts from a number of nations to help us develop a scientific, commercial and exploration strategy for the lunar exploration activities that will begin as early as 2018.

For all of you who believe that space will be the setting for an explosion of entrepreneurial energy, I am here to tell you that NASA shares your enthusiasm. Indeed, we believe there will be

tremendous opportunities for commercial enterprise with respect to the provision of fuel, supplies, bases and equipment for the crews that will live and work on the moon for six months at a time.

Soon you will be returning to your jobs, eager to take on the challenges I've just described. I would like to leave you with an image from our current space program that never fails to excite me. This July, my wife, Gail, and I were privileged to witness the launch of the Space Shuttle *Discovery* on our nation's Independence Day. On the evening before, we were invited to a night viewing right out at the launch pad. As we snaked along the access road by bus to the launch pad, we could begin to see the

space shuttle launch system brightly illuminated against a black summer night, and it was just beautiful. I likened it to the scene in the classic American movie the Wizard of Oz in which Dorothy and her traveling companions can see the Emerald City the first time from the Yellow Brick Road. It was just magical.

Indeed, it was wonderful the next day to watch the shuttle soar into the sky, with those seven astronauts onboard, and to see those main engines glow for a full four minutes. My friends, there are some things worth having emotions about and that's one of them. I sincerely hope that each one of you has the opportunity to see one of those space

launches up close, or better yet, to be a participant in a future mission to the moon, Mars or beyond.

Again, I thank you for your warm greeting, and I wish to extend once more my congratulations to the summer students and my best wishes to you in your future journeys to the stars.