

Prepared Statement of Michael J. Massimino, Ph.D., Mechanical Engineering Professor,
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Mr. Chairman and members of the Subcommittee, thank you for this opportunity to appear before you to discuss the accomplishments of America's space program during my missions and my perspective on our nation's current goals and priorities for the future of human space flight and space exploration. Being asked to testify for this committee is an honor, and I am privileged to share my experiences and opinions here with you today.

I became an astronaut in 1996 and have been fortunate to fly on two space shuttle missions: STS-109 in March of 2002 and STS-125 in May of 2009. Both of my flights were Hubble Space Telescope servicing missions. The Hubble servicing missions are vital examples of how human spaceflight can contribute to ground-breaking research being done by scientists on Earth. Based upon my experience, I believe NASA's joint focus on innovation in scientific research and its commitment to human spaceflight continues to be a worthwhile goal for our space agency. More than that, it is an noble endeavor for us as a nation and as custodians of this incredible planet we call home.

NASA has made great headlines in recent years, most notably by landing a rover on Mars, but amazing as that achievement is, putting human beings in orbit remains the single most important element of successful space exploration. My first mission set a team record of spacewalking time on a single space shuttle mission. My second mission broke that record. During each spacewalk, having an astronaut on the scene was what saved the day. For example, on one of my spacewalks I was required to improvise a solution no robot or rover could have possibly done: manually pulling off a handle that was held fast onto the telescope with a stripped fastener. This was the only way to complete the repair of the Space Telescope Imaging Spectrograph, a scientific instrument that can, among other capabilities, analyze the

atmospheres of planets in other solar systems in order to establish the possibility of finding other places in the universe capable of sustaining life.

The efforts of the human spaceflight program during my missions, in partnership with NASA's on-going ground control operations and scientific research programs, have allowed the Hubble Space Telescope Program to increase our understanding of the universe. Our servicing missions have enabled scientists from around the world to make major discoveries, including dark matter, dark energy, black holes, and the existence of planets in other solar systems. In addition to these great scientific advances, through Hubble's iconic images we have also brought the incredible beauty of the universe to the citizens of the world.

NASA has also in recent years accomplished much in terms of building and expanding international partnerships, an endeavor that I believe should continue with our nation's leadership. While an astronaut from 1996 to 2014, I had the opportunity to contribute to the planning, building, and establishment of scientific operations of the International Space Station (ISS). Among the many achievements of the ISS is bringing different countries together toward a common goal. Through the ISS and its work, the United States, Russia, member countries of the European Space Agency, Canada, and Japan work together as partners on international space projects and research. We live in this world together, and working in unison to study it can only help us all. The friendships, alliances, and accomplishments of the ISS have shown that, given common scientific and exploration goals, countries can accomplish great things together.

As a Professor at Columbia University and the Senior Advisor for Space Programs at the Intrepid Sea, Air, and Space Museum in New York City, I have seen first hand how the space program can inspire students to pursue degrees and work in STEM fields. I have seen how space travel inspires them to dream of accomplishing great things in life. Just as I was

inspired as a small boy by my astronaut heroes in the Apollo program, today's students are inspired by NASA's accomplishments. They are excited about the opportunities that NASA and commercial space companies have waiting for them when they complete their education. I have not found any other engineering or science endeavor that can inspire students to study in the STEM fields the way that our nation's space program can.

When I speak to my students about their interest in space-related STEM careers, there is a major opportunity open to them now that was not readily available when I was a college student over 30 years ago. The commercial space opportunities created by partnerships with NASA are very appealing to young people. There is still great interest in working for NASA and its contractors, but many students see themselves as future space entrepreneurs. Thanks to developments from NASA, many highly successful entrepreneurs see space as the next frontier for economic success in the private sector. I think we will continue to see major success stories in commercial space enterprise, and they will play a major role in inspiring young people to pursue STEM careers while also providing economic benefits for our country.

Lastly, I would like to share a story about my experiences in space and how it affected my perspective on the precious life we have here on planet Earth. During a short break in my tasks during my second spacewalk on STS-109, I had the opportunity to take in the beauty of our Earth from 350 miles up in orbit. From that height you can see the curvature of the planet, this bright ball of blue set against an endless infinity of black. The first thought that went through my mind was, "This is the view from heaven. This is what our planet must look like from heaven." But then a second thought immediately replaced that one. I said to myself, "No, it's even more beautiful than that. This is what heaven must look like. Maybe this is heaven." I felt as if I were looking into paradise. That is how beautiful our Earth looks like from space. It is a fragile oasis. It keeps us alive, safe from the chaos and dangers of space, just above our atmosphere. It is our home, and we need to take care of it.

Thank you again for inviting me to testify here today. I have had some great experiences in my life, and being able to provide input to your subcommittee is a great honor for me and an opportunity I very much appreciate.

