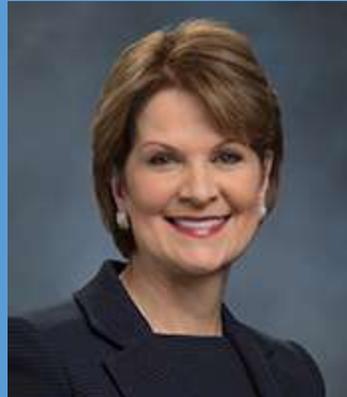


# There are No Borders in Space: International Cooperation Will Drive the New Space Age

Remarks as Prepared by  
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*Chairman, President and  
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Thank you, Director [Menachem] Kidron, for that kind introduction. Good afternoon, everyone.

It's a pleasure to be in Jerusalem for the 66<sup>th</sup> Annual International Astronautical Congress.

This is the perfect day to talk about the future of space, as today is an important anniversary in the history of spaceflight. It was on this date in 1947 that U.S. Air Force Captain Chuck Yeager took an experimental rocket-powered plane, affectionately called a bullet with wings, to speeds faster than the speed of sound. For the first time ever, mankind had broken the sound barrier and a new rocket-powered age of innovation had begun.

While the science and technology that drove that successful flight changed the economics of air and space flight, the human element was just as important to its success. Two days before that historic flight, Captain Yeager broke two ribs when he fell off a horse. Knowing full well that he would never be allowed to fly in this condition, he went to a local doctor in town and had them tape him up. He was in so much pain he had to use a broom handle to close the cockpit door. Yet he pushed on. And the rest, as they say, is history.

That combination of exceptional human perseverance, combined with extraordinary science and technology, continues to resonate across the space industry today. Since this is the biggest event of the year for the global space community, you might say it's like our industry's World Cup. Except, there's one key difference. We're not competing. We're celebrating our common commitment to space. Because we know, as this year's conference theme underscores, that space is "The Gateway for Mankind's Future."

The IAC is a wonderful opportunity for our entire community to come together—scientists, researchers, engineers, astronauts, government officials and industry leaders. And it's deeply gratifying to look out at this room and see how much has changed over this event's 66 years. At the first IAC back in 1950, just eight countries were represented, seven of them from Europe, and there were only 20 delegates. Today, we are several thousand strong, with 270 member organizations representing 64 countries.

And it isn't just our size that's changed. The way we think about our mission has too. At the dawn of the space age, we understood space exploration as a "race" between two superpowers, fighting to be the first to each celestial milestone. Now, instead of a highly exclusive Space Race, we are engaged in a

collective Space Rally, with more countries leveraging the countless benefits of space in new and significant ways. More countries are operating satellites and developing space-based technologies. And more countries are working together to advance our understanding of the cosmos.

There's no better example of that than the International Space Station. Just last month, a Russian spacecraft launched from Kazakhstan with Russian, Danish and Kazakh astronauts on board to join their colleagues from the United States and Japan. American astronaut Scott Kelly posted a great time-lapse video on his Facebook page of nine astronauts eating dinner together, some of them hanging from the walls, others floating close to the ceiling. He wrote, "Dining together can radically shift perspectives, blurring boundaries just like looking down on Earth from our vantage point... especially when dinner partners are from all over the world."

Seventeen nations have sent visitors to the International Space Station and that number is sure to grow. Because, more than ever, international partners are working together to unlock the richness of space and to bring its many benefits to our nations, our industries and our next generation. And we can do even more. We're within reach of a truly global space enterprise, where every man, woman and child on Earth can benefit from space exploration, from its scientific missions and from the economic growth space fuels here on Earth.

To make that happen, we'll need collaboration at every level and across the international community. Space is no longer above us or between us. It surrounds us. It connects us. Space is the place in which we can realize our fullest potential on Earth. There are no borders in space, and international cooperation will drive this exciting new space age.

Speaking of exciting, how many of you saw the movie that opened recently called, "The Martian"? It is one of those rare, big-budget Hollywood space films that doesn't include robots, aliens, super-heroes or warp drives. There is no super villain. The only challenge is the planet Mars itself. In short, it's a real space story—a story about survival through science.

Of course, we believe the best movies about Mars have been filmed by NASA's rovers: Spirit, Curiosity and Opportunity. And Lockheed Martin has been proud to participate in every single U.S. mission to Mars to date. Following in the footsteps of those rovers, NASA's Orion project has been touted as a first step toward Mars journeys, and the innovations being built for Orion today inspired the vision set forth in the film.

Lockheed Martin, which built the capsule, even sent Orion into orbit carrying a tribute to "The Martian" film. It was the first sketch director Ridley Scott made of the lead character. It was featured on the cover page of the script. The movie's producers worked closely with NASA to make it realistic, yet also exciting. That's not easy. As NASA consultant Andy Weir, the author of the book that inspired the film said, "NASA's whole job is to keep exciting things from happening—to make sure there's not a panicked, 'Oh my God we're gonna die' situation. It's more like, 'OK, well, this thing broke. That's why we have four independent backups.'"

On the one hand, that's exactly what we do. We work to keep space exploration from being exciting in a bad way. However, on the other hand, everything about space exploration is exciting—the science, the technology, the people, the goals. It really is about as exciting as it gets. We stand on the verge of a new era of space exploration. And we have the opportunity to work together to harness the benefits of space for *all* of mankind.

And that's what I want to explore with you today—how the global community can benefit from the new space age. The future will see international partners working together more closely than ever to unlock the power of space: to bring connectivity to every corner of the globe, to strengthen global security, and to push the boundaries of exploration. Together, we must continue to strengthen already robust International partnerships and work collaboratively to realize the full potential of space exploration.

To do this, we must focus on three priorities for the future of space. The first is space as an instrument to create global industrial partnership. Second, is space as a driver of economic growth. And third is space as an opportunity to inspire the next generation of innovators.

I'd like to spend a few minutes discussing each of these priorities and the role we all play in advancing them.

The first and most fundamental key is partnership, because I believe that partnership will be the differentiator in the new space age. In the last 15 years, the number of nations with space programs has doubled. In fact, more than 50 nations have current or planned space programs. That is great news. The collaboration of great nations is the best way to mitigate the costs, share the investments, and pool the resources needed to really open up the solar system for exploration.

In addition, organizations like the International Astronautical Federation are critical to strengthening existing international partnerships in space exploration, scientific missions and commercial endeavors. Lockheed Martin is fully committed to this effort, with an already robust set of international partnerships in space. From government to commercial, and from satellites to space exploration, we're positioned to help global customers achieve their most important missions in space.

For example, with Orion, we're partnered with the European Space Agency on the platform's service module, which provides critical power, infrastructure, fuel and supplies for the capsule.

With the InSight Mars Lander, CNES of France and DLR of Germany are providing the two primary instruments, a seismology sensor and a heat measurement sensor, both of which just began testing at our facility in Denver.

The United Kingdom, the Netherlands and Canada are partners with the U.S. on the Advanced Extremely High Frequency system, an ultra-secure military communications satellite network. All four nations have successfully connected to the constellation, demonstrating the power of coalition interoperability.

And GPS III, the next generation of the U.S. Air Force's Global Positioning System, will share a new, common civil signal with other international navigation satellites like Galileo and GLONASS. That means people around the world will have more accurate and reliable positioning data and connectivity from a truly global positioning constellation.

This is only the beginning. With so many nations rallying into space today, the potential for collaboration is exponential. The borders that divide us here on Earth must be erased in space. Collaboration has the potential to drive down costs, improve productivity and facilitate the sharing of best practices across nations, all while helping to keep the infrastructure of space manufacturing robust and diversified. This collaboration and partnership has the potential to drive remarkable growth—in discovery, in knowledge and in technology. It also has the potential to drive economic growth, which leads me to my next point.

The second priority for the future of space is building a new space economy.

Space-based technologies are ubiquitous today. Want to find an address? Find out the weather forecast? Talk to someone on the other side of the world? The fact is, space is already an enabler of economic growth. And with today's innovations combined with the power of international partnerships, it has the potential to drive magnitudes more.

Today, the space sector represents about one percent of global economic activity. Yet, I could argue that without space, the other 99 percent wouldn't be nearly as effective or efficient. Partners are developing commercial satellites that connect people around the world, enable distance learning and fuel job growth in many sectors of the global economy.

Our weather prediction capabilities will improve dramatically in the near future when new satellites like GOES-R enter service. This new generation of remote-sensing and climate-monitoring satellites also

provide improved capability for emergency response and recovery efforts, archeological and community growth planning surveys, and resource tracking and water quality measurements—all important contributions that benefit people worldwide today and will continue to for years to come.

However, economic growth is driven by investment. We must continue, as nations and industry leaders, to take the long view on investment in space technologies. We must continue to invest in research and development that will yield innovative new technologies. And we must continue to recognize and reward innovation at every level. No one knows where the next great technology breakthrough will come from. However, we can guarantee it won't come from innovations that go unfunded. That investment goes beyond R&D. It must focus on human capital as well.

Which takes me to my third point—using space to inspire the next generation of innovators and explorers.

Today, we face a global shortage of qualified candidates in the fields of science, technology, engineering, and mathematics—the STEM fields. For us to successfully design, build and navigate deep-space missions, we must have the skilled workforce to get the job done. We know that space has the power to inspire a new generation of STEM innovators, and it's never too early to plant that seed.

For example, Eric Coffman is Lockheed Martin's Orion Propulsion System Design Lead. When he was five years old, he visited the Kennedy Space Center with his father. He said that trip lit the spark and began his passion for rocket science. Today, Eric is helping to build the deep-space capsule designed to one day send humans to Mars—quite literally his dream job.

Last century, the Moon Mission inspired new technology development, a renewed focus on education, and a new generation of motivated young scientists and engineers. Today, with our revitalized deep-space missions, we have the opportunity to inspire another generation to do the same thing. However, we must ensure that generation is prepared. Advancing STEM education requires collaboration among industry, educators, policy makers and families around the world. As a technology leader with nearly 60,000 scientists and engineers, Lockheed Martin is committed to working with everyone in this room to develop programs that will educate and inspire tomorrow's scientists, engineers and mathematicians.

Among the many programs we fund is the Lockheed Martin Space Education Center at the Space Foundation in Colorado Springs. The program directly targets schoolchildren and educators across the U.S. by providing equipment and hardware for STEM programs, scholarships for field trips, 'virtual' visits to space-based facilities and labs, and support for teacher development programs. One of the most exciting parts of this program is the Space Foundation's Mars Robotics Laboratory, one of the largest labs of its kind in the world. The lab features a simulated Martian terrain that allows students to program robotic rover missions. And the students love it.

Here in Israel, we are partnering with the Israeli Ministry of Science, Space and Technology to enrich the STEM curriculum at every level of education, for kindergarten through high school and university. Our first pilot kindergarten in Be'er Sheva will have a technology and science-focused curriculum. The new school is a partnership between Lockheed Martin, the Be'er Sheva Municipality, the Rashi Foundation, and the Ministry of Education.

Be'er Sheva is known as the hometown of Israel's first astronaut, Ilan Ramon, who courageously lost his life while serving as the space shuttle payload specialist of STS-107, the fatal Columbia mission. Ramon has been an inspiration to young people who wish to carry on his legacy of service and innovation.

I'm traveling to Be'er Sheva tomorrow to officially open the new kindergarten. We'll have a model of the Orion capsule on display and I'll do some experiments with the children, all with the goal of inspiring the next generation of engineers like Eric Coffman and astronauts like Ilan Ramon.

It's programs like this that make me optimistic about the future of space, and our future as well. That future is exciting, and it will be made better by the people in this room. Now is the time to come together, as the world's space leaders, to embrace the full-potential of international collaboration in space. Lockheed Martin is proud to be championing that kind of industry-to-industry and government-to-industry

collaboration to move us forward. With today's technology, we are closer to the stars every day. And together, as nations, industry leaders and thought leaders, we can use space to shape the future of mankind.

I was born in a small town in the state of Kansas. And I think the state's motto sums up our collective efforts nicely: *Ad astra per aspera*—To the stars, despite adversity.

Ladies and gentlemen, today's space age can be an extraordinary force for good. As I look around this room, I see many people working hard to overcome the challenges of interplanetary travel, working hard to solve difficult problems, working hard to ensure human beings can continue to push the boundaries of science and discovery.

Together, we can leverage space as an instrument for global partnership, a driver of economic growth and an opportunity to inspire the next generation of innovators. After all, the word universe comes from the Latin, *universum*, meaning "the whole turned into one." And, in the words of Colonel Ilan Ramon, "There is no better place to emphasize the unity of people in the world than flying in space."

In that spirit of unity, let us set our eyes on ever-more wondrous horizons. The universe beckons.

As we break the boundaries of Earth, we will find no boundaries in space. Together, let us write a bold new chapter in the history of humankind.

Thank you very much.