

for New Hampshire, the former President of New England College of Optometry and he has served with distinction, as the Mayor of Manchester, New Hampshire.

I commend Dr. Dupuis for his outstanding leadership and shining example. His varied professional experience shows him to be the ideal representative of New Hampshire business. I wish him the best as the new President of Notre Dame College in Manchester, New Hampshire. I am proud to represent him in the United States Senate. ●

### 30TH ANNIVERSARY OF THE FIRST LUNAR LANDING

Mr. WARNER. Mr. President, I ask unanimous consent that the Senate now proceed to the immediate consideration of S. Con. Res. 46, submitted earlier today by Senators SHELBY and SESSIONS.

The PRESIDING OFFICER. The clerk will report.

The legislative clerk read as follows:

A concurrent resolution (S. Con. Res. 46) expressing the sense of Congress that the July 20, 1999, 30th anniversary of the first lunar landing should be a day of celebration and reflection on the Apollo-11 mission to the Moon and the accomplishments of the Apollo program throughout the 1960's and 1970's.

There being no objection, the Senate proceeded to consider the concurrent resolution.

Mr. SESSIONS. Mr. President, I rise today to offer a few thoughts about space, the vision that is needed to take us there, and to say a few words of appreciation on the anniversary of one of the greatest accomplishments in world history. First, I recognize and thank all the people—scientists, flight operations experts, administrators, maintenance experts, astronauts, and every other member of the NASA team and Apollo program—who worked so hard to make the successful launch and mission of Saturn V to the moon a reality and victory for America.

When President Kennedy announced his intentions to devote the resources and support to NASA that would be necessary to accomplish the monumental task of landing men on the surface of the moon, our space program was born. Up until that magnificent moment when Neil Armstrong let everyone watching and listening know that the "Eagle had Landed" and for many years afterward, our space program flourished and steamed ahead making great strides in nearly every area of space exploration. Unfortunately, in recent years, while marked by continuing and important scientific medical research and several noteworthy events, our space program has become stagnant in comparison to the growing and vibrant NASA of the past. I am one member of Congress who feels very strongly that too much remains to be learned and explored for our space program to remain in neutral any longer.

Mr. President, on the anniversary of one of our greatest accomplishments, we have slipped dangerously close to the edge. If we do not act, we may lose one or more of the most historically significant pieces of our space program in existence. I am proud to say that one of the last three of these great artifacts remaining from the Apollo Project—the Saturn V rocket—stands on the grounds of the U.S. Space and Rocket Center in Huntsville, Alabama. But the fact remains that this rocket is in need of restoration and protection. I join my colleague and fellow Alabamian, Senator SHELBY, as an original cosponsor of the resolution that has been introduced which calls upon the Congress to provide federal assistance to fund the much-needed restoration and protection projects for the Saturn V rocket at the U.S. Space and Rocket Center. This funding will enable this great monument to our space program to live on as an enduring symbol of America's greatness both here on earth and beyond. I call on my colleagues in Congress to lend the assistance that is needed to protect the great history of our space program.

Mr. President, as I stated earlier, I am one member of Congress who believes that NASA embodies many of the most important qualities of our nation. We are a nation of explorers and inventors—proud, hardworking and brave. Our legacy as a nation is one of unmatched proportion. We must do our part to continue to build upon the past for the benefit of our future generations.

Mr. President, safe, reliable, low-cost transportation has been the key to the development of frontiers from the dawn of time. Ocean-going vessels enabled the discovery of the New World and initiated global commerce. The stagecoach transported early settlers and cargo across the untamed American West, and the transcontinental railway opened up this new frontier to vast numbers of settlers. Today, modern airways are a critical element of international commerce.

Transportation has made it possible to explore and develop the frontiers that emerged throughout history. Thirty years ago it was a Saturn V rocket carrying three men to the moon. And now, transportation is again the driver as we boldly prepare to explore deeper and develop the largest frontier of all—the frontier of space.

As a nation of explorers, I would like to think that we see the opportunities for scientific research and new space industries as limitless in scope and benefit to mankind.

Consider the possibilities:

Manufacturing medicines that are far superior to drugs made on Earth.

Even today the work that is being lead by NASA and its Marshall Space Flight Center, in particular, in Microgravity Research is paying tremendous dividends. Already this research is saving lives. The research that will be conducted on the International Space Station will take us even farther.

Consider the possibility of Mining resources from orbiting bodies, or servicing large communications and remote sensing platforms in low earth orbit without bringing them back to Earth.

Consider: Generating cheap, clean power from the Sun, or exploring new worlds and safely, routinely and affordably transporting passengers to and from space.

It all sounds like science fiction today and it is because the current high cost of space transportation has locked the door to these opportunities. I believe that NASA is ready to start turning science fiction into science reality—to unlock the door to a new frontier of opportunity.

The problem is this, space launch is not fully and completely reliable as we want it to be and its costs have been very expensive. Current launch costs consume valuable NASA resources and limit the ability to achieve its science and exploration goals. Only the highest priority science payloads are being launched and human exploration is on hold until we can solve this problem of launch costs.

Launch costs have also slowed the commercial development of space. While the U.S. space program faces new challenges to its decades long, global leadership position, the U.S. commercial space launch industry has dwindled from complete market dominance in the mid-1970's to only 30% on a greatly expanded worldwide market today. The United States has lost 70% of market share to the Russians, to the French, and to the Chinese. Several factors including foreign government subsidization and the constant optimization of 30 year old technology by foreign firms are at the heart of a problem this Congress ought to solve—now!

While improvement and evolution of existing systems and technologies are necessary in the face of ever increasing competition abroad, it will take a revolution to open the space frontier and enable the development of space. Our investments in launch technology have been sporadic over the years, resulting in high costs and small, incremental improvements in launch safety and capability. Today, many entrepreneurs realize the significance of the expanding commercial space marketplace, but are left to solve the hard problem of access to low Earth orbit with just their innovative spirit and today's technology.

We have had a rash of failures of expendable launch vehicles recently; 6 of the last 8 launches have been failures. Still, NASA continues to fly the Space Shuttle safely. But that safety record comes at a high cost to the people at United Space Alliance, NASA Kennedy, Marshall, and Johnson Space Flight Center (JSC).

Space launch is expensive because of complex systems that require extensive checkout and human intervention. Small margins result in high maintenance and replacement. Flight hardware reuse is limited. Launch facilities

and range safety operations are out of date.

Achieving simplicity and robust performance has never been achieved in space launch. NASA has taken the brute force approach to beating Earth's gravity by expending hardware during ascent; or they have shaved weight and squeezed the last fraction of a percent of performance from the propulsion systems—gaining performance at the expense of simplicity and robustness.

I have talked to the people at NASA Marshall. They have lived with the Shuttle propulsion systems and they have a lot of ideas that will make the next generation 100 times safer and 10 times cheaper than today; and their ideas don't stop there! They believe that, in 25 years, they can develop the technology that will improve safety over 10,000 times and reduce cost by 100 times that of the current Shuttles. I believe that the people at Marshall Space Flight Center, in cooperation with Stennis Space Center and the Glenn Research Center as well as other NASA scientists, can revolutionize space propulsion in the next 25 years. NASA administrator Dan Goldin shares this same view.

They believe that they can combine simplicity and with a robust capability that will increase reliability 100 fold while multiple abort options and safe crew escape systems will provide passenger safety equivalent to today's aircraft. They believe that they can develop the technology that will result in what they are calling "a beautiful machine," safe and reliable first, then affordable. This marriage of simplicity and performance can only be obtained through major breakthroughs in space transportation technology at the basic component and system level.

Mr. President, it is a top priority of NASA to develop innovative space transportation technologies for commerce, civil space travel and the defense of the nation. This is not a might do task, but a must do task if this nation is to once again lead the way in space exploration.

Unlike the prior generation, our generation has not invested in a future of space exploration. Let's step back in time about 50 years. America and Russia were on separate paths to launch a satellite into orbit around the Earth. The Space Age had begun. In a laboratory at the University of Pennsylvania stood the world's first general purpose computer—the ENIAC. Spanning 150 feet and weighing 30 tons, ENIAC's twenty banks of flashing lights indicated the results of fourteen ten-digit multiplication processes in one second. It was one hundred times faster than a mechanical calculator, enabled by 18,000 water-cooled vacuum tubes. Tubes blew and were replaced several times an hour, but they ushered in the electronic age.

Only 7 years after the invention of the transistor, the first silicon-based transistorized computer was developed. Four years later a practical integrated

circuit was the genesis for printing conducting channels directly on silicon surfaces. Less than twenty-five years after the development of ENIAC, Intel introduced the first microprocessor, using 2,300 transistors on a 108 Kilo Hertz silicon chip. The U.S., at that time, was just beginning the development of the Space Shuttle.

In the 28 years since, the number of transistors on a single chip has increased from 2,300 to 7.5 million and the number of instructions per second has increased more than 3,000 times. The processor capacity has increased at a rate of a factor of two every 18 to 24 months and the cost per kilobyte of computer memory has decreased by a factor of 640,000. Today over 44% of U.S. homes have a personal computer. The Space Shuttle is still the workhorse for human space flight and remains the only reusable launch system.

Today it is impossible to think of a world without computers or to imagine that the ideas we developed and that we take for granted might have been strenuously resisted in the past. And while it seems barely credible today that scientists, engineers, and businessmen five decades ago didn't initially grasp the implication of this new technology—this has been the case more often than not throughout history.

Now let's look forward in time. Imagine a world where traveling to an orbiting space production facility is as common as making a business trip on a commercial airliner? Does this seem plausible? How probable did personal palmtop computers seem fifty years ago? Technology was the engine that enabled these breakthroughs—technology will enable safe, reliable, affordable access to space over the next twenty-five years. I believe that we will see major steps toward this goal in the next 5 to 10 years if we invest now.

Over the next decade, NASA intends to increase safety by a hundred fold while reducing cost tenfold. Safety will be defined as the probability of a catastrophic failure once out of every 1,000,000 flights. This dramatic leap will come by departing from a past emphasis on cost and performance to a focused new paradigm of safety and reliability, which in turn, will drive down costs. Improvements in safety will require future space transportation systems to assure crew safety from pre-launch to landing. To accomplish this, launch systems must be inherently reliable, functionally redundant wherever practical and designed to minimize or eliminate catastrophic failure modes. Next generation systems will have the ability to complete their missions with at least one engine failure from liftoff. Designs will minimize the opportunity for human error in test, checkout and operations. By incorporating a crew escape capability for all flights and reducing the number of launch elements, NASA will be able to meet their safety goals.

In this time-frame, launch costs will fall from current levels of \$10,000 to

\$1,000 per pound to low earth orbit. In order to achieve this ambitious cost goal, today's multi-stage, partial and fully expendable rockets must be replaced by single stage, fully reusable systems. A single stage to orbit Reusable Launch Vehicle (RLV) can eliminate assembly and checkout costs currently associated with the large number of complex interfaces on today's Space Shuttle. Full reusability will eliminate the need to throw away expensive hardware and reduce the need for ongoing production, but a key technology will be the manufacturing technology to build large, very lightweight, composite propellant tanks and structures. The expertise that will make these lightweight structures possible is the current Shuttle tank production facility at Michoud, Louisiana.

Systems in 10 years will have to accommodate hundreds of missions per year and will be commercially certified for hundreds of flights.

This level of cost reduction has the potential to enable new, nontraditional uses of space. Taking this vital first step is comparable to the first 25 years in the development of the microprocessor when computer processors went from millions of dollars to hundreds of thousands of dollars.

Over the next 25 years more dramatic improvements will be enabled by an all flight crew escape system and horizontal takeoff, which allows the vehicle to abort its takeoff after reaching maximum power—much like an aircraft. Costs will fall to \$100 per pound for low earth orbit missions. This low price per flight will create a 15-fold increase in the size of the current projected space launch market. This larger market will, in-turn, enable this system to be developed independent of U.S. Government financial support. The number of flights per year will jump to over 2,000, which will require certification for thousands of flights.

Future generations of space travel will be almost as routine as commercial air travel today. The passenger risk will be reduced to 1 fatality per 2,000,000 flights at a cost of \$10 per pound to orbit. Crew escape will be eliminated as system reliability matures. In forty years, true Spaceliners will be capable of satisfying a market demand over 10,000 missions per year—achieving near airline-like life certification.

Doubling and tripling the structural margin will require us to move beyond traditional rocket engine cycles to a combined air-breathing rocket cycle. These new propulsion systems could allow space vehicles to takeoff horizontally like an airplane. These air-breathing vehicles will provide greater opportunities to return to earth from orbit—a key requirement for routine commercial package delivery and military priorities. The technologies required for these systems will truly marry the best of the aeronautics and space communities.

The large increase in flights per year will demand that current operations

and maintenance procedures be revolutionized. Unlike the current shuttle, which requires over 5 months to process with several thousand personnel, the next generation of systems will be turned around in one week with less than one hundred personnel. In contrast to the rigorous tear-downs and inspections required for the Space Shuttle's subsystems, the next generation vehicle's on-board health monitoring systems will tell the ground crews which systems need replacement before landing. Due to modern computer and display technologies, the number of personnel required on launch day will be reduced from 170 to about 10. An automated mission planning system will enable changes in payload and weather to be factored in less than twenty-four hours. The payload will be processed off-line and integrated into the vehicle the day prior to launch. Range safety will be accomplished using the Global Positioning System, reducing the number of personnel to a handful. Upon landing, the vehicle will, various ways, automatically restore itself, requiring minimal human intervention.

In twenty-five years, vehicles will be re-flown within one day and in forty years, within several hours with crews numbering less than ten. Fully automated ground processing systems will require only a handful of personnel to launch the vehicle. Due to the increased intelligence of on-board systems, only cursory walk-around inspections will be required between flights. Payloads will be fully containerized and loaded hours before flight. Range safety will be replaced by Aerospace Traffic Control Centers scattered around the globe, passively monitoring the multiple flights using commercial broadcast towers.

Today we've imagined our boundless future of space exploration on safe, affordable space transportation.

But, stop to think what our future will be if we don't develop the fundamental technological building blocks. To realize these ambitious goals, we must provide consistent funding for our technology programs over the next several decades.

What will inspire the next generation of Americans? We must not kill the spirit of the Lewis and Clark's among us. Our next great adventure is the exploration and development of space! If we continue to cut corners on our financial commitment without conquering this tremendous challenge of making space travel safe and affordable for ordinary people, we will stunt the pioneer spirit that brands us all as Americans.

NASA has accepted the responsibility for pushing technology because this is vitally important for our nation. The nation must focus resources on accelerated technology development if we are to remain the worldwide technology leader. We will drive the technology breakthroughs necessary to sustain and enhance U.S. military capabilities.

Our Nation's defense in very dynamic times must rely on cutting-edge space launch technologies to protect our borders.

But low-cost space transportation is not just about surviving. It is about thriving economically. Our wildest dreams of doing business on the space frontier surely don't even begin to skim the surface of the incredible economic opportunities waiting beyond the horizon.

Today, the X-33 and X-34 programs are making significant strides, taking us towards these goals and will provide us with new benchmarks in how to develop and operate modern reusable launch systems. Today, I want to salute NASA's goals and dreams. They are the same ones that took Apollo 11 to the Moon 30 years ago. They should be ours as well; to develop and demonstrate in flight the required technologies to win the promise of flights to low earth orbit for \$100 per pound, with a 10,000 times increase over today's safety levels.

Mr. President, I also want to endorse NASA's approach of "build a little, test a little, fly a little" by performing rigorous ground testing. I believe it is imperative to move forward with our X-34 sized flight demonstrations within the next 5 years.

We are at a defining moment in the development of space. The key is making space transportation affordable for ordinary people. Through innovative technology development, NASA will lead our nation as we unlock the door to the final frontier. I call on all my colleagues, and indeed the citizens of our great land, to give them our support. Let us return to a time when we made our dreams a reality—let us return to being a nation of explorers.

Mr. GRAHAM. Mr. President, thirty years ago today human beings first set foot the surface of the Moon. The Apollo 11 landing was an unprecedented accomplishment, one that marked the culmination of a national commitment to space exploration initiated by President Kennedy.

As many of my colleagues will remember, our country's space program was a child of the Cold War. In many ways, our rivalry with the Soviet Union in space was the primary impetus for the Apollo Program. The Soviets launched the first artificial satellite. They put the first man in space. They achieved the first space walk. Thirty years ago, we were intent on responding to those milestones by putting the first man on the Moon. As then Senate Majority Leader Lyndon Johnson said, "I, for one, don't intend to go to sleep by the light of a Communist moon."

Today there is no Cold War, no unifying theme around which to rally our space program. Yet our exploration of space remains as important today as it was three decades ago. History tells us that those nations which developed the frontier prospered. Space is the latest frontier.

Mr. President, if I am not mistaken, the Chinese character for "crisis" is the same as that for "opportunity." As our nation recalls the triumph of Apollo, we face both crisis and opportunity in our space program.

On May 25th, the Cox Commission reported multiple instances of sensitive American nuclear and missile technology falling into the hands of the People's Republic of China. It identified the lack of a sufficient United States commercial space launch capacity—a problem that has sent launch business to nations like China—as one of the reasons for this transfer of information.

The numbers tell an alarming story. Though nearly 70% of the world's commercial satellites are assembled in the United States, less than 45 percent are launched from our shores. Because more than 60 U.S. satellites have been approved for export to launch from Russia, the Ukraine, and China since 1995, U.S. rocket manufacturers and their vast supplier network have lost approximately \$2.4 billion in direct revenues—a figure that doesn't include American satellite launches by the powerful European Arainespace Consortium.

Why are we losing out to other nations? One reason is cost. As scientist and author Gregg Easterbrook pointed out in the June 2, 1998 edition of the New York Times, companies that launch satellites aboard American space vehicles can expect to pay between \$10,000 and \$12,000 per pound. Nations like China—where government partially subsidizes the cost of satellite launches—can offer the same services for half the cost.

A second reason for our nation's declining share of commercial space launches is the relatively small number of available launch vehicles in the United States. From 1977 to 1986, the space shuttle was the only spacecraft authorized to carry satellites into orbit. That nearly ten-year hiatus in American rocket development gave a huge advantage to nations that used that time to build and improve the Russian Proton, European Ariane, and Chinese Long March rockets.

Last fall, I joined Senator CONNIE MACK (R-FL), U.S. Representative DAVE WELDON (R-FL), members of the House Science and Senate Commerce Committees, and a broad, bipartisan coalition in tackling these problems through the enactment of the Commercial Space Act. That legislation took steps to create a stable business environment for the U.S. commercial space industry, while simultaneously making the government's use of space technology more efficient and saving taxpayers millions of dollars. Even better, it did not add new federal regulations or raise taxes by so much as a penny. President Clinton signed it into law on October 28, 1998.

The Commercial Space Act will help to address the cost and capacity problems that have plagued our nation's

commercial space industry. For example, it breaks the federal government's monopoly on space travel and encourages launch options that might lower costs. Until the passage of this legislation, the space shuttle was the only American craft authorized to both leave and re-enter our planet's atmosphere. Commercial companies that have an interest in providing repeat services to their customers might benefit from the same principle of reusability that powers Columbia, Discovery, Atlantis, and Endeavor.

In addition, our legislation helps to mitigate the United States' dearth of launch vehicles by allowing the conversion of excess ballistic missiles into space transportation carriers. International arms control agreements have rendered these missiles useless for national defense, and the hundreds in storage eat up close to \$10 million a year. Replacing their nuclear warheads with scientific and educational payloads will give the United States a practical, low-cost method for putting satellites into orbit.

But more and less expensive rockets will do little to erase other nations' competitive advantage if the United States does not have the infrastructure needed to launch them. That's why a similar bipartisan coalition recently introduced the Spaceport Investment Act. This legislation would make the financing of spaceport construction and renovation 100% tax-free—an innovation that could spur private investment in the important task of building and modernizing our nation's space launch facilities.

While airports, high speed rail, seaports, mass transit, and other transportation projects can raise money through tax-exempt bonds, spaceports do not currently enjoy such favorable tax treatment. This amounts to a glaring omission in federal policy. Airlines, cruise, and shipping lines could not exist without airports and seaports. In the same fashion, state-administered spaceports provide vital incentives for space-related economic growth by supplementing the launch infrastructure already provided by the federal government.

My home state offers tangible proof of spaceports' value to the commercial space industry. Since its creation in 1989, Spaceport Florida has facilitated more than \$100 million in space-related construction and investment projects. This includes the modification and conversion of Launch Complex 46 from a military to a commercial space facility.

Virginia, Alaska, and California also host spaceports, and ten other states—Idaho, Louisiana, Mississippi, Montana, Nevada, New Mexico, North Carolina, Oklahoma, Texas, and Utah—are considering their establishment. We must take advantage of this opportunity to make the public and private sectors partners in the effort to build badly needed launch sites around the nation.

The Commercial Space Act and Spaceport Investment Act will boost the effort to recapture space business in the United States. But these legislative initiatives must be part of a larger solution. In the coming months, I will be exploring the idea of a National Space Summit that brings together lawmakers, federal and state space administrators, business leaders, and academic representatives with the goal of launching a united effort to revitalize our commercial space industry and reverse our rapidly declining share of space launches.

Mr. President, while we recognize the historical significance of today's date, we must not let the accomplishments of the past dilute our focus on the future. My proposal is an innovative and efficient method for encouraging private and public cooperation in the important goal of revitalizing our national reach for the stars.

I urge my colleagues in the Senate to join us in this important effort to repave our pathways to outer space. This would be a fitting tribute to the brave pioneers who landed on the Moon thirty years ago today. Those early explorers sacrificed much for our nation's commitment to space exploration. Just yesterday, one of these pioneers, Apollo 12 Commander Pete Conrad, was buried in Arlington National Cemetery. Let us produce a lasting memorial to these astronaut heroes by rededicating ourselves to their cause.

Mr. BURNS. Mr. President, today I rise to join my colleagues in a tribute to the 30th anniversary of the Apollo 11 mission. Thirty years ago today, our nation was launched into the lead of a global space race. Not only was this an important step for our nation, it was an important step for America in the Cold War—a war waged in technological and economic terms rather than on the front lines of the battlefield. A war in which America later claimed victory during President Reagan's administration.

The Apollo 11 mission played a role in that victory. The famous words, "one small step for man, one giant leap for mankind" was more than appropriate. It was one of the highlights of NASA and during the pinnacle of the agency's existence. On the morning of July 16, 1969, the mission's Saturn V rocket was launched from the Kennedy Space Center, landing on the moon four days later. On board with Neil Armstrong and Buzz Aldrin was Michael Collins, who piloted the command module while his comrades used a landing craft, the *Eagle*, to make that historic visit to the lunar surface.

The mission was a unifying event in an era when America was wracked by social protest and divided over the Vietnam War. People across the country, and around the world, sat glued to television sets as the Apollo crew did what was once thought impossible. The important achievement of Apollo demonstrated that humanity is not forever chained to this planet.

Mr. President, I regret that the push for manned space flight has faded in the years since Apollo. I find it ironic, that 30 years after first going to the moon that children today are learning about space travel in history class, rather than science class.

May 13, 2004, will mark the launch of the Corps of Discovery bicentennial. It was during this adventure that Meriwether Lewis and William Clark, along with a small band of men, set out on a voyage of exploration that was to earn them a place in America's history. Tasked with exploring a new and largely unknown world, Lewis and Clark opened the West and provided storytellers with a compelling, historic drama.

Today, NASA's role in space exploration parallels the role of the Corps of Discovery. No other federal agency is faced with such intriguing and limitless boundaries. No other federal agency captivates the attention of school children around the nation.

But NASA's obstacle is not a technology barrier—rather it is a barrier of financial abilities. Space activities require decades of planning. Short-term constraints of a political agenda do not address this necessity. It is not where we want to be next year, rather where we want to be 20 years from now. That is a blindness many politicians are hampered with.

For the sixth year in a row, NASA's budget has declined while its productivity improves. We know what NASA is able to do. In the 1960s, the Saturn/Apollo program put a man on the moon. Only recently has the commercial sector approached NASA's heavy-lift capacities.

Our nation's history is one of triumph and tragedy. We have rejoiced in NASA's success and mourned in its grief but the Apollo 11 mission was one of the greatest moments in our nation's history.

I thank the Chair.

Mr. FRIST. Mr. President, thirty years ago Neil Armstrong took his historic first steps on the surface of the moon, fulfilling the dreams of his fellow astronauts, his country, and the entire human race. His "small step" has inspired the following generations in a quest to explore the frontiers of space. Space travel has encouraged ingenuity that permeates American society. National Aeronautic and Space Administration (NASA) accomplishments have led to technological advancements utilized in everyday life, as well as increased math and science interest among school children, and the development of a multi-billion dollar commercial space industry. While there are many benefits of space exploration, the United States still faces the challenge of developing a cost effective strategy to manage existing space programs. We should build on the legacy of Apollo II by forging ahead with both basic R&D and advanced future technologies in a cost effective and well-managed collaborative effort with private industry.

The accomplishment three decades ago of the seemingly impossible task of sending a man to the moon led to a newly found confidence in the power of science. President Kennedy challenged America in 1961 to send a man to the moon, when many people believed it to be impossible. Within a decade, America had risen to the challenge by demonstrating their technological superiority over the rest of the world with Apollo 11. Such a powerful display of technology is a catalyst of a cycle resulting in an increased standard of living for many Americans. The cycle begins as many young people are motivated to pursue science as an academic discipline. New scientific interest results in an increase in basic research funding at universities and corporations. The cycle is completed when advancements ranging from more comfortable mattresses to better radiation treatment for cancer patients begin to make their way into everyday life. Other emerging applications include agricultural remote sensing techniques, distance learning, and telemedicine. The increased productivity attributable to these applications will serve as a stimulus to the national economy.

Commercial space launch is an entire industry that has stemmed from the application of technology in space. The broadcast, telecommunications, and weather industries all increasingly rely on satellites to provide the most effective services. The U.S. commercial launch industry had revenues totaling \$2.4 billion dollars in 1997. This industry is projected to grow exponentially over the coming years. The Commerce Department estimates that over 1,700 satellites are expected to be launched over the next ten years—70% of which will come from the commercial industry. It is clear that if the United States is to remain the world's leader in this domain, we must begin now to modernize the Nation's space launch capacity. That means reviewing the state of our outdated launch vehicle technology, our costly infrastructure, and the financial insurance needs that are key to the growth of this industry.

The immediate future of NASA lies in the International Space Station, an international cooperative effort to build a research facility in space. The International Space Station will provide a unique environment for research with the absence of gravity, allowing new insights into human health and disease treatments. However, this innovative research facility bears a price tag of approximately \$100 billion dollars to the American taxpayers. Although this program is a long-term investment which will bring discoveries unimaginable to today's scientists, it is our duty to protect the American taxpayers from unsatisfactory performance of the participating foreign partners, prime contractor, and program management. Congress must insist on further accountability from NASA in order to most effectively support this

program. We should not allow delays in foreign components of the International Space Station to increase the burden on American citizens.

On this day in 1969, Neil Armstrong knew that he was making an important first step. We have the responsibility of taking the next step by determining the future path for NASA and the space industry. Our efforts to reach the moon required a creative approach to a difficult challenge. In the spirit of the Apollo program, I call on NASA and policy makers to take a creative approach to ensuring fiscal responsibility while fostering the innovation that benefits every American.

Mr. BROWNBACK. Mr. President, I rise in support of the resolution submitted by Senator SHELBY commemorating the 30th anniversary of the first lunar landing, an event that will be remembered as one of the most important events of our country and century. Americans remember the landing on the lunar surface not only with a sense of historical significance, but also with one of honor and pride in the accomplishment of the crew of Apollo 11 and the men and women of NASA who made it possible.

This mission was conducted during a tumultuous time in our country's history. Sending a man to the moon forced us to marshal our country's vast talent and technological resources and to drive our creative energies to the breaking point. Apollo proved that necessity is the mother of invention. The Apollo mission required us to make quantum leaps in propulsion systems, airframe materials, electronics, and other scientific areas in an impossible amount of time.

I congratulate Neil Armstrong, Buzz Aldrin, the late Michael Collins, and NASA for their courage to lead our country to the new world of space. While our accomplishments in space have continued, space still offers us a vast and unexplored frontier. America has been, and should remain a world leader in space research, technology, and exploration. It is on this 30th anniversary of the first lunar landing that America should renew its support for our space program and challenge ourselves once again as we begin a new century.

Mr. WARNER. Mr. President, I ask unanimous consent that the concurrent resolution be agreed to, the preamble be agreed to, the motion to reconsider be laid upon the table, and any statements relating to this resolution be printed in the RECORD.

The PRESIDING OFFICER. Without objection, it is so ordered.

The concurrent resolution (S. Con. Res. 46) was agreed to.

The preamble was agreed to.

The concurrent resolution, with its preamble, reads as follows:

S. CON. RES. 46

Whereas the Apollo-11 mission successfully landed a manned spacecraft on the Moon on July 20, 1969, marking the first time in history that humans have walked on the surface of the Moon or any other planet;

Whereas the 6 Apollo missions successfully departed Earth aboard a Saturn V Rocket, the largest and most powerful American rocket ever produced, en route to the Moon;

Whereas 12 Americans successfully landed on the surface of the Moon where they performed various experiments and collected samples for study, and planted the flag of the United States of America in the lunar soil achieving a milestone in American and human history;

Whereas the contributions of other Americans who made up the thousands of contractors and Government employees who worked on the Apollo program are recognized; and

Whereas the events of the Apollo missions are examples of the great achievements of the American space program reflecting the explorer's spirit of the American people: Now, therefore, be it

*Resolved by the Senate (the House of Representatives concurring).* That it is the sense of Congress that the 30th anniversary of the first lunar landing should be a day of celebration and reflection on the Apollo-11 mission to the Moon and the accomplishments of the Apollo program throughout the 1960's and 1970's.

#### ORDERS FOR WEDNESDAY, JULY 21, 1999

Mr. WARNER. Mr. President, I ask unanimous consent that when the Senate completes its business today, it stand in adjournment until the hour of 9:30 a.m. on Wednesday, July 21. I further ask consent that on Wednesday, immediately following the prayer, the Journal of proceedings be approved to date, the morning hour be deemed expired, the time for the two leaders be reserved for their use later in the day, and the Senate then begin a period of morning business until 10:30 a.m., with Senators permitted to speak for up to 5 minutes each, with the following exceptions: Senator DURBIN, or his designee, 30 minutes; Senator HATCH, or his designee, 30 minutes.

The PRESIDING OFFICER. Without objection, it is so ordered.

Mr. WARNER. Mr. President, I further ask unanimous consent that following morning business the Senate resume consideration of the intelligence authorization bill, and Senator BINGAMAN be recognized at that time in order to offer an amendment.

The PRESIDING OFFICER. Without objection, it is so ordered.

#### PROGRAM

Mr. WARNER. For the information of all Senators, the Senate will convene at 9:30 a.m. and be in a period of morning business for 1 hour. Following morning business, the Senate will resume the debate on the intelligence authorization bill. Senator BINGAMAN will be recognized to offer a second-degree amendment regarding field reporting to the Kyl amendment regarding Department of Energy reforms. Other amendments are expected to be offered and debated throughout tomorrow's session of the Senate. Therefore, Senators can expect votes throughout the day and into the evening.

The majority leader would like to inform all Members that the Senate will