DEPARTMENT OF THE AIR FORCE

PRESENTATION TO THE SENATE ARMED SERVICES COMMITTEE

SUBCOMMITTEE ON EMERGING THREATS AND CAPABILITIES

UNITED STATES SENATE

SUBJECT: Fiscal Year 2001 Air Force Science and Technology

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(Acquisition)

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Mr. Chairman, Members of the Subcommittee, and Staff, the Air Force is committed to a strong Science and Technology (S&T) Program to help achieve our vision of an integrated air and space force capable of rapid and decisive global engagement. In 1944, General Hap Arnold stated, "The first essential of air power is pre-eminence in research." That truth still resonates today. By investing in a broad and balanced selection of technologies, we will continue a successful legacy of superior technology development and transition more high-payoff technologies into warfighting capabilities.

Innovation is key to ensuring today's Air Force will meet the challenges of tomorrow. Innovation is part of our aviation heritage and will enable the Air Force to continue to meet the

future security needs of the nation. We must be prepared for worldwide availability of advanced weapons, wide-ranging terrorist activities, increasing regional instabilities, and other emerging and less predictable threats. We must develop technologies that permit flexible, yet lethal, forces capable of operating far from home on short notice. We must also be able to afford these new capabilities once we develop them. To meet these challenges, we want the most promising and affordable technologies in order to protect our forces, minimize collateral damage, and win decisively.

THE AIR FORCE S&T PROGRAM

The Air Force S&T planning process uses guidance from the National Military Strategy, Defense Planning Guidance, Joint Staff guidance, and the Air Force Strategic Plan to focus our S&T investment. The resulting Air Force S&T Plan ensures we properly balance and support the near-, mid-, and far-term needs of the joint warfighter. This fiscally-constrained plan replaces the former ten technology area plans with a more integrated picture of the Air Force S&T investment for the future, consistent with our single laboratory organization. To ensure program relevance, we involve system developers and warfighters to focus our efforts on the warfighters' most urgent needs. Finally, to ensure the technical quality of the program, the Air Force Scientific Advisory Board, Reliance Technology Area Review and Assessment teams, the Defense Science Board, and other peer review groups regularly evaluate and critique our S&T programs.

The single most important factor to strengthening the Air Force S&T Program is an overall increase in the Air Force topline funding. We have been faced with the reality of a fiscally-constrained environment – further burdening our ability to maintain readiness. The high operations tempo the Air Force has maintained in support of peacekeeping operations and conflicts, such as Kosovo, has placed a great burden on our people and resources. Now, urban

warfare has become a post-Cold War trend that is likely to deepen in the 21st Century, requiring new forms of technology to counter the threat. These factors have created a tremendous competition for resources, limiting the amount of funding available for our S&T programs.

In spite of these tight budgets, the Air Force is working hard to increase S&T funding and maintain a balanced S&T portfolio. The Air Force has heard the message of Congress regarding two percent real growth within the S&T budget. In fact, the Air Force's Fiscal Year 2001 President's Budget request exceeds two percent real growth using the Fiscal Year 2000 President's Budget request as a baseline. Our Fiscal Year 2001 request of $1,291.3 million is up almost $110 million above our Fiscal Year 2000 request of $1,182.8 million. This breaks out to approximately 16 percent for Basic Research (6.1), 46 percent for Applied Research (6.2), and 38 percent for Advanced Technology Development (6.3). We are also working hard to increase the S&T budget in future years as well.

Two key areas represented in this increase are Basic Research and Aerospace Propulsion. We have increased funding for Basic Research to focus on potential breakthrough technologies that could dramatically change the future. For example, research is underway to understand and apply the quantum effects of molecular electronics to unleash extraordinary computing power--a thousand times faster while occupying a smaller volume even when compared to the most ambitious forecasts for silicon chips. MegaLasers could enable a new airborne laser with over four times the laser power output to engage targets with greater effectiveness at much longer ranges. Biosensors, modeled after the behavior of infrared sensors in biological organisms, could reduce the weight of current infrared sensor packages a hundred-fold.

The Air Force has also increased its investment in Aerospace Propulsion to reflect our commitment as the Department of Defense's lead Service in airbreathing and strategic and space

propulsion. Most of the increase went to two programs. The Integrated High Performance Turbine Engine Technology (IHPTET) program aims to increase the performance and efficiency of jet turbine engines. While, the Integrated High Payoff Rocket Propulsion Technology (IHPRPT) program seeks to double our 1995 rocket propulsion capabilities by 2010. In addition, the Air Force restored funding for Hypersonics propulsion technology to support the Defense Advanced Research Project Agency's (DARPA) hypersonic missile project.

STRETCHING LIMITED S&T DOLLARS

As we embark into the new Millennium, we will leverage technology to achieve new levels of combat effectiveness. Our strategy is to pursue integrated technology solutions that support our warfighter's highest priority needs. We must also pursue the fundamental enabling technologies that will improve tomorrow's Air Force. As technological superiority is increasingly a perishable commodity, we work hard to stretch our limited S&T funding, by not only "inventing the future" ourselves, but also by speeding the introduction of new technologies to our warfighters.

One way we will do this is by implementing the new concept of Applied Technology Councils. The councils are composed of two- and three-star, senior-level representatives of the Air Force Research Laboratory (AFRL), our acquisition product centers, and our major user commands. They are ensuring that up-front, documented planning by all stakeholders takes place, to improve the probability that a demonstrated technology will transition out of the laboratory to the customer. This new process will ensure AFRL only pursues those Advanced Technology Demonstrations with the highest user support and transition funding.

General Ryan, the Air Force Chief of Staff, has said, "We have to work on today's readiness; but, also, we have to work on tomorrow's readiness; not fight the last war, but fight the

next war." He also pointed out that the force is currently deploying around the world with 20-year old equipment and noted, "Even if we execute every modernization program to date, much of the same equipment will be 30 years old in 2015." Because most deployed technology will remain in use for decades, the Air Force S&T Program not only focuses on enhancing performance, but has also increased its emphasis on the reliability, maintainability, and affordability of weapon systems. Emphasizing affordability from the very beginning through training of our management and engineering staff, as well as through careful review of technology transition pilot projects, allows us to reduce the costs of technology early in the process. This emphasis on affordability will help us avoid excessive future costs in the acquisition phase and throughout a product's life cycle.

The funding level for Fiscal Year 2001 forces us to be very selective about investing in the right technological opportunities. First, this requires carefully integrated planning by the Air Force and leveraging our S&T dollars by cooperating with other Services, Agencies, the private sector, and international partners. For example, we rely on the Army as the lead Service for chemical-biological technology research. The Air Force has strong inter-Agency efforts such as our program in aging aircraft, which is focused on detection and amelioration of corrosion and fatigue in aging structures. It is closely coordinated with the civilian aging-aircraft research programs at the National Aeronautics and Space Administration and Federal Aviation Administration. Second, we have restored funding for Hypersonics propulsion technology. The DARPA program for an advanced hypersonic missile is relying on the output of the Air Force's propulsion system for its in-flight demonstration in 2002. Third, our Dual-Use S&T program helps us to leverage commercial technologies.

Finally, the Air Force is closely involved in international technology cooperative efforts for S&T such as the Four Powers (France, Germany, United Kingdom, and the United States) cooperative technology development programs in tactical missile propellants, insensitive high explosives, and aircraft battle damage repair. Another type of international cooperation is the bi-lateral work we are doing with the United Kingdom on developing a novel new target detection device, fuze, and warhead integration concept.

International cooperative efforts help us increase the number of sources for innovative ideas and transition new capabilities to the warfighter. Cooperation in the early stages of technology development also helps to ensure any ensuing technology product will be interoperable with the equipment of potential allies in coalition operations. The Air Force S&T Program is now a highly-leveraged, highly-interdependent, focused effort that the Air Force considers critical to ensure technological superiority over future adversaries.

S&T WORKFORCE FOR THE 21ST CENTURY

All of the Air Force advances mentioned would not be possible without a quality workforce of scientists and engineers; both those within AFRL plus those within the industrial and academic communities. For instance, Dr. Ahmed Zewail, of the California Institute of Technology, is the 1999 recipient of the Nobel Prize in chemistry for his work in femtochemistry. The Air Force Office of Scientific Research (AFOSR) has supported Dr. Zewail for 12 years. Dr. Zewail's research has led to a measurement technique that may be described as the world's fastest camera. Femtochemistry enables scientists to understand how and why certain chemical reactions take place. Potential applications of his research range from design of molecular-electronic devices to rocket propellants. AFOSR support for his pioneering research continues today.

However, the Air Force currently faces a potential personnel crisis, a migration of skilled workers out of the lab, compounded by a very limited hiring of talented new workers. While less visible than some of the defense industry mega-mergers with their attendant layoffs, the Air Force has significantly downsized and consolidated its laboratory structure. Today, more than 30 percent of the civilian workforce is eligible to retire in the next five years, and approximately 50 percent can retire in the next six to ten years. Complicating this situation, entry-level employees — those with 25 years or more until retirement — constitute less than ten percent of our lab population, and we are increasingly non-competitive in attracting entry-level scientists because of the robust civilian economy.

The Air Force is undertaking several efforts to continue attracting top-flight talent to maintain the quality of its S&T workforce. In response to the potential for a large exodus as more experienced personnel retire, the Air Force commissioned a study last year titled, "Science and Technology Workforce for the 21st Century" (STW-21). The guiding vision was to enhance

our S&T personnel management practices and maintain the excellence and relevance of the Air Force's S&T workforce. The study recommends the Air Force undertake an innovative partnering concept called Government-Owned, Collaborator-Assisted (GOCA). Under this approach, an AFRL research site could team with one or more collaborative associates to get the proper cross-section of skills into the site. For example, the site might use the civil service system to hire and hold its core, long-term employees. It could partner with a prominent university to obtain graduate students and post-doctoral fellows, and it might partner with a Federally-Funded Research and Development Center or a university to access world-class researchers for a specific project. The site will also use Air Force uniformed personnel to ensure familiarity with Air Force requirements and to train technical officers for later assignments in requirements, planning, and acquisition. Currently, the Air Force is exploring the managerial and legal aspects of the concept. If the concept becomes reality, it will bring partnering in the S&T community to new levels by allowing greater integration of the work between multiple agencies, and perhaps between agencies and industry.

EXPEDITONARY AEROSPACE FORCE

Last summer, the Air Force announced the beginning of our Expeditionary Aerospace Force (EAF) journey. Today, our first two aerospace expeditionary forces (AEFs) have assembled and deployed in part to Southwest Asia. It has not been easy to get to this point. It has been a learning experience, but it is the first step in trying to create a stable and predictable lifestyle for all of our men and women. We have many more steps to take along this path as we transform the Air Force from a forward-based, Cold War force to an expeditionary force able to respond to crises around the globe.

The war in Kosovo served as a testing ground for future information warfare operations. We validated the reach-back concept, pulling forward information from continental United States-based support elements to enhance the effectiveness of our deployed fighting forces while reducing the footprint of our combat support forces. The Air Force tested the commercial high-tech products and services that helped fulfill the EAF vision of "light and lean" expeditionary forces. And, for the first time, we tied key mission processes to web-based networks, making critical information instantly available to in-theater forces.

The Air Force is already applying lessons learned in Kosovo to its EAF planning. We're developing and incorporating new technologies and concepts to ensure our warfighters get all the right information, at the right time. To do that, "network-centric" information infrastructures will use "smart push" to make assured information available to the warfighters, while providing ensured and easy access, or "pull," of timely assured information in a user-friendly format. Our theater deployable communications systems will provide our aerospace expeditionary wings with secure and nonsecure voice, data, imagery, e-mail, and messaging - doubling the current capability of our aerospace expeditionary wings, while getting to the fight with only one-half the airlift requirement.

Using the latest advances in information technology developed by AFRL, the Air Force demonstrated several advanced planning and execution tools in the Joint Expeditionary Force Experiment last August. The Joint Assistant for Deployment and Execution (JADE) allowed us to generate time-phased force deployment plans and tasking orders to send any combination of forces anywhere in the world, and have them arrive in the right place at the right time, and in the right sequence. This tool will allow the Air Force to complete in one hour a process that normally takes two weeks. Using a unique adaptation of the Global Air Traffic Management system, we

were able to use both military and civilian air-traffic communication systems to provide continuous contact with our airlifters. Still another tool we demonstrated was the Worldwide Aeronautical Route Planner. Using multiple parameters, such as flight performance models, global weather patterns, country avoids, current navigational aids, and airway restrictions, this tool plots the most fuel and time efficient route possible in seconds versus hours.

Training is another integral part of implementing our EAF vision. The technology for Distributed Mission Training (DMT) is an area that holds great promise. Using state-of-the-art simulation technology, DMT permits geographically-separated aircrews to jointly train in a synthetic battlespace, connected electronically from their distant air bases. Importantly, DMT delivers this enhanced training from the home station, which helps the Air Force limit the amount of time airmen spend deployed and facilitates the training of Air Expeditionary Forces as they prepare for deployment.

Agile combat support technologies will enable the logistics and combat support communities to deploy, sustain, and protect personnel, assets, and capabilities across the spectrum of operations. Effective beddown support and sustainment allow deploying forces to downsize the amount of equipment to start-up and sustain base operations. This reduced footprint lowers the need for prepositioned assets and airlift requirements. For example, logistics command and control and other logistics decision support tools leverage information technology, enhance agile combat support command and control, improve base support planning, and enhance tailoring deployment packages for specific locations and scenarios. Other leading edge technologies, such as the Logisticians Contingency Assessment Tools, will continue to enhance agile combat support in the future.

AEROSPACE INTEGRATION

The Air Force's journey continues towards evolving our air and space competencies into a full spectrum aerospace force. As more countries enter the space domain, the potential for spaced-based threats will increase and space control will become a required capability of the Air Force. Our strategy calls for a continued increase in space technology investments. This will enable a fully integrated aerospace force which relies on space-based information-gathering and communications technologies to find, fix, track, target, engage, and assess any potential target, worldwide. As a result, we have adjusted, and will continue to vector, the content of the Air Force S&T Program to focus on technologies, especially space technologies, that support Air Force strategic planning**.** Our advantage in space gives us a decisive edge in the battlespace -- it helps our targeting efforts with weather predictions, supplies much of our communications in and out of theater, guides our precision munitions with incredible accuracy, and provides us with an unparalleled capability to see the battlespace.

Over the past two decades, the Air Force has developed a number of key capabilities that clearly demonstrate the further potential of integrating air and space competencies. For example, integrated intelligence, surveillance, and reconnaissance (ISR) systems, which combine sensors in space, in the air, and on the ground, are becoming standard for global ISR capabilities. In Operation Allied Force, our U-2s flying over Kosovo and Serbia relayed their data via satellite in real-time to the United States. Real-Time-Into-Cockpit (RTIC) information and sensors technologies have taken ISR a step further. RTIC conveys perishable battlespace information directly to the cockpit, enabling aircrews to take advantage of new target opportunities while avoiding new threats. This concept became a reality with the Multi-Source Tactical System and

Track II systems that provide satellite communications links to aircraft already en route to the target area.

In Fiscal Year 2000, the Air Force invested approximately 13 percent of the S&T portfolio in space-only programs with another 25 percent applicable to both air and space. By Fiscal Year 2005, we plan to reach a level of S&T investment in space-only efforts of approximately 30 percent while retaining our current level of investment in technologies applicable to both air and space at approximately 25 percent. This shift toward space will include increased research in large deployable optics, reusable space vehicles, hyperspectral imaging, and microsatellites. Placing increased emphasis on space-related technologies will require eliminating, reducing, or restructuring of other S&T programs, most of which are non-space in nature. We believe, however, these changes are necessary to ensure the Air Force invests in the technologies needed to enable a superior 21st Century Aerospace Force.

Joint Vision 2010 and the Air Force Strategic Plan will guide the Air Force space technology investment roadmap. To achieve the overarching vision of space superiority, the Air Force will implement two major technology thrusts, Space-Based Surveillance and Space Capability Protection. The Space-Based Surveillance thrust focuses on active and passive surveillance technology for detecting and identifying threats. The Space Capability Protection thrust focuses on the survival of our space systems, whether the threat is natural or man-made. These thrusts are broadly defined to address everything from radiation hardened electronics to threat warning and attack reporting. They include both passive and active techniques for self-protection, as well as the development of protocols for debris management and mitigation. These investments form the foundation for tactical situational awareness for the 21st Century.

Small satellites represent one area of innovative surveillance technology for maintaining United States space superiority in the 21st Century. Lightweight solar arrays will combine advances in thin-film photovoltaics, smart mechanisms, and multifunctional structures to attain a two-to-three times improvement in specific power over current state-of-the-art solar arrays. A cable-free next generation spacecraft will integrate electronics, sensors, power distribution and storage, and thermal management with modular, lightweight structures to potentially reduce weight ten-fold and volume over two times compared to current state-of-the-art spacecraft. Combined with highly integrated packaging and processing concepts, flywheel energy storage, and advanced electric propulsion concepts, future spacecraft will be one-third the mass of current designs, at lower cost, with higher performance.

As previously stated, the Air Force is the Department of Defense's lead Service in both airbreathing and strategic and space propulsion. Currently, the Air Force is working on rocket propulsion breakthroughs that will provide our next generation capabilities in space. For example, the Air Force is pursuing Super Energetic Propellants. The expert application of advances in supercomputing technology, chemical theory, and chemical synthesis techniques is leading to breakthroughs in new fuels and rocket propellants that are signature-free and environmentally friendly. Super energetic propellants could lead to significant reductions in fuel consumption and could cut the cost of delivering payloads to space in half. The Integrated High Payoff Rocket Propulsion Technology (IHPRPT) program is a national (Department of Defense, National Aeronautics and Space Administration, and Air Force) effort to double 1995 rocket propulsion capabilities by 2010. The boost and orbit transfer component of IHPRPT seeks to reduce expendable launch costs to $2,000 per pound to low earth orbit, which represents a 30

percent cost decrease. Improvements in satellite maneuvering could increase spacecraft repositioning by 500 percent, or increase satellite payload by 30 percent.

Complementing the rocket propulsion program is the Integrated High Performance Turbine Engine Technology (IHPTET) program, which aims to increase the performance and efficiency of jet turbine engines. Maximum thrust performance of modern jet engines is limited by temperature and airflow constraints. Therefore, the Air Force is developing internal engine components made of new high temperature shape-shifting ceramics that will allow significantly higher combustion temperatures, which could translate into fuel savings of approximately 40 percent. This breakthrough technology may enable a new type of engine, the turboburner, which could bring about a paradigm shift in engine technology similar to that realized with the invention of the jet engine. Research is also underway using advanced super computer capabilities, to identify fuel components and treatment techniques to enhance fuel properties for increased performance and reduced fuel consumption. This "smart" fuel technology has the potential of drastically reducing the Air Force fuel logistics tail. The sooner we act in building the technological underpinnings of a truly integrated aerospace force, the faster we can transform it into a force capable of meeting the challenges of the 21st Century.

DUAL-USE TECHNOLOGIES

The Air Force has two dual-use programs that help us leverage commercial technology for military needs, the Dual-Use S&T program and the Commercial Operations and Support Savings Initiative (COSSI) program. The Dual-Use S&T program jointly funds research projects with industry for the development of dual-use technologies to solve specific technical problems. All projects yield military value and the industrial contribution can be characterized by "spin-on" of commercial technology for the benefit of reducing the cost and enhancing the performance of Air

Force systems, subsystems, and components. For example, a 1997 dual-use technology program for holographic polymer-dispersed liquid crystals (HPDLC) is providing enabling technology applicable to both commercial and military high-resolution reflective displays, laser protection filters, and diffractive telecommunication elements. The technology has successfully transitioned to the commercial sector for specific display applications such as personal High Definition TV viewers.

The COSSI program's mission is to reduce Department of Defense Operations and Support (O&S) costs by routinely inserting commercial components into fielded military systems. Typical technology areas include computers, electronics, software, information systems, open system architectures, advanced materials, and manufacturing processes. For example, replacing the F-16 Heads-Up Display electrical unit's current old and high maintenance computer with a commercial off-the-shelf-based computer will produce an estimated O&S savings of more than $300 million by project completion in Fiscal Year 2002.

LINKS TO MANUFACTURING TECHNOLOGY

Manufacturing Technology (ManTech) is a keystone Air Force affordability program that is a natural companion to the Air Force S&T Program. ManTech focuses on process improvements, cycle time reduction, and commercial/military integration. A pervasive program, ManTech works with industry, academia, and government organizations. Program benefits are found in both new acquisitions and in fielded systems. The Air Force ManTech program has had two primary customer areas: aircraft and missiles/munitions. Beginning in Fiscal Year 1999, the program increased its emphasis on sustainment and space. Improvements in sustainment not only offer a tremendous opportunity on extending the service life of many of our legacy systems, but also are a necessity to reduce O&S costs.

The ManTech program continues to provide affordable process improvements across the full weapon systems life cycle. A recently completed fiber optic gyro project reduced production costs 80 percent and makes fiber optic gyros an affordable option for the Advanced Medium Range Air-to-Air Missile and other systems. Another ManTech project significantly improved metal forming process yields at Warner-Robins Air Logistics Center and reduced cycle times from 45 days to 6 days. This project is being implemented at the Oklahoma City Air Logistics Center as well. An ongoing ManTech project is the Composites Affordability Initiative, an effort to reduce airframe composite costs by as much as 50 percent.

IMPACT OF AIR FORCE S&T

As we begin facing the challenges of the 21st Century, it merits a moment to look at our successes over the past few years. From virtual reality to laser-propelled space vehicles, the Air Force S&T Program has broken technology barriers and pushed the envelope in support of the warfighters and the various missions of the Air Force and has transferred technology to civilian industry. Each directorate of AFRL has taken science fiction and made it, or is in the process of making it, science fact.

In Air Vehicles, there have been significant advances made in propulsion integration, computational fluid dynamics, reconfigurable flight control, and simulation-based research and development that have enabled the development of the F-22. In Directed Energy, adaptive optics, atmospheric compensation, tracking and pointing, and highly accurate optical acquisition technologies have enabled the development of the Airborne Laser. In Human Effectiveness, programs such as the transition of the Visually Coupled Acquisition Targeting System to the Joint Helmet-Mounted Cueing System, Distributed Mission Training, integrated Panoramic Night

Vision Goggles, and laser eye protection will provide future warfighters significant improvements in safety and capability.

In Materials and Manufacturing, materials have been designed via neurocomputing and new cladding and coating processes have been developed to protect critical sensors. In Information, advanced data storage devices, a Deoxyribonucleic Acid (DNA) optical storage media, and tagging devices for ground equipment and personnel have been created. In Propulsion, technology advances include Lightcraft - a small laser-propelled spacecraft, advanced turbine engines for strike/global reach aircraft, and a hypersonic engine that could power a vehicle at eight times the speed of sound.

In Sensors, large aircraft infrared countermeasures to counter ground-to-air threats and sensorcraft - a visionary concept for an unmanned ISR airborne vehicle have been developed. Automatic target recognition technology to see targets under trees is being cooperatively developed between the Air Force and DARPA. In Munitions, scientists and engineers have successfully merged a low-cost Laser Radar seeker, a highly efficient airframe, and a futuristic multi-mode warhead into a small, autonomous weapon that can think for itself, called the Low-Cost Autonomous Attack System.

In Space Vehicles, technology advances include micro satellites (TechSat 21), deployable optics and sensors, hyperspectral imaging (Warfighter-1), and experimental inflatable space structures. Finally, in Basic Research, the Air Force Office of Scientific Research continues investment in many areas of interest. The November 1999 issue of Chemical and Engineering News highlighted their work on synthesizing the high-energy N5+ cation, the first new all-nitrogen species to be isolated in more than a century, as one of the top five achievements in chemistry for 1999. It holds the promise of opening up a new class of extremely energetic

materials for Department of Defense use. Such materials will allow very long-range missions without refueling and provide enabling technology for access to space.

CONCLUSION

The Air Force is in the midst of a modernization that is radically changing airpower and the nature of war. Stealth and precision strike, in particular, have injected improvements into combat power unlike any we have known since the introduction of the jet engine. We are making important strides in command and control, long-range power projection, and mobility that are intended to result in a truly integrated Expeditionary Aerospace Force.

The Air Force is fully committed to providing this nation the advanced aerospace tools and technologies required to meet America's interests around the world and ensure we remain on the cutting edge of technology, performance, military flexibility, and affordability. The technological advantage we enjoy today is a legacy of decades of investment in S&T. Likewise, our future warfighting capabilities will be substantially determined by today's investment in S&T. Therefore, the Air Force is working hard to stabilize and increase funding for the S&T Program. As we face the new Millennium, our challenge is to advance technologies for an Expeditionary Aerospace Force at the same time we move aggressively into the realm of space technologies. With the building blocks of a revitalized workforce and a solid strategic plan, we can truly go where no one has gone before - to lead the discovery, development, and timely transition of affordable, integrated technologies that keep our Air Force the best in the world. As an integral part of the Defense S&T team, we look forward to working with Congress to ensure a strong Air Force S&T Program tailored to achieve our vision of an integrated air and space force.