

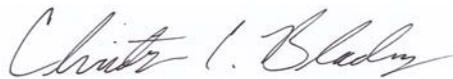
**National Aeronautics and Space Administration  
Washington, DC**

**NASA ADVISORY COUNCIL**

**November 29-30, 2005**

**House and Senate Office Buildings  
Washington, DC**

**MEETING MINUTES**



**Christopher C. Blackerby  
Executive Director**



**Harrison H. Schmitt  
Chair**

**NASA ADVISORY COUNCIL (COUNCIL)  
House & Senate Office Buildings, Washington, DC  
November 29-30, 2005**

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Meeting Report Prepared By:  
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**NASA ADVISORY COUNCIL  
Rayburn House Office Building, Washington, DC  
November 29, 2005**

***Opening Remarks***

The Hon. Senator Harrison H. Schmitt, Chair of the NASA Advisory Council (the Council) called the meeting to order at 8:00 a.m.

Dr. Michael Griffin, NASA Administrator, welcomed members and attendees to his inaugural Council meeting. The Council is one of two bodies specifically chartered by Congress to give advice to NASA. The Council members have the highest credentials of accomplishment and will work with NASA across several major areas to provide external guidance and critique. Advisory groups that have worked in the past with the mission directorates will be brought under the auspices of the Council. One of the goals of this meeting will include development of the Council's "go-forward" plan. He asked all of the members to look carefully at the time commitment that would be necessary for the work, and to inform him if they would not be able to support the commitment needed for the plan.

Senator Schmitt also welcomed and thanked the members. He indicated that the group would work to provide productive insight to the Agency, and also emphasized the importance of members' regular attendance. Senator Schmitt thanked the House Science Committee and its staff for the use of its Hearing Room in the Rayburn House Office Building, and noted that this meeting was open to the public and held in accordance with the Federal Advisory Committee Act (FACA) under which the Council will operate.

Senator Schmitt reviewed the manner in which the Council was organized. The newly organized Council is composed of five Committees: Exploration, chaired by Lt. Gen. James Abrahamson; Science, chaired by Dr. Charles Kennel; Aeronautics, chaired by Mr. Neil Armstrong; Audit and Finance, chaired by Mr. Robert Hanisee; and Human Capital, chaired by Dr. Gerald Kulcinski. A regular meeting of the Council and its Committees will be held on a quarterly basis. On the day preceding each Council meeting, the Committees will meet; Subcommittees, if they are formed, will meet sometime prior to the Committee meetings. The Council and each of its Committees will publish a short annual report, including approved recommendations. Those reports should include a tentative plan for the succeeding year. According to the NASA Policy Directive for advisory

committees, the Council Committees will operate under the letter and spirit of the FACA although not formally chartered as FACA committees. Committees and Subcommittees may have open meetings, subject to the discretion of the Chairs, but may engage in fact-finding meetings not open to the public. Committees will present and discuss their recommendations for Council action with the Council as a whole in open session.

After Senator Schmitt briefly described his background and interests, each of the Council members similarly introduced themselves (see Council biographies in Appendix B).

Dr. Griffin thanked all of the members for their service on the Council. The programs to be presented for review by the Council are within an overall NASA strategy, and within that context, the advice will be most useful. The civil space program is not going to receive a lot of new money. The President has allowed NASA to grow with inflation and slightly more, but it is not reasonable to expect growth beyond that. The space program will go forward in a new vector. Dr. Griffin indicated that he believes that the future of the US Space Program lies beyond Earth orbit, but that future needs to be reached in an orderly, careful, and expeditious way. We must protect and preserve the robust Space Science program created in NASA over the years. Inevitably, science, as well as other activities in NASA, has been asked to help pay to return the Shuttle to flight; however, despite rumors to the contrary, science has not been asked to pay for human exploration. Aeronautics is a third major pillar within NASA and is crucial to the nation, although it is not equal financially to the other pillars. Dr. Griffin noted that we need to understand that there has been substantial progress within the entrepreneurial sector that could be taken advantage of, and helping to strengthen that segment of the community is a primary goal.

Finally, as the President stated in his speech last year, we invite other nations to join in the exploration journey. However, cooperation should not put international partners or commercial providers on the critical path. The Council can provide its advice in this area. It can help NASA in its endeavor to keep stakeholders in the administration and Congress satisfied.

Senator Schmitt then noted that the primary goal of this meeting was for the members to gain a strong background in NASA missions and issues through a series of informational presentations and discussions. Over the next two days, the Council received updates from NASA's mission directorates as

well as the financial, human resources, small and disadvantaged business, and education offices.

***Federal Advisory Committee Act (FACA)***

Ms. Diane Rausch, NASA Advisory Committee Management Officer (ACMO), briefed the Council on the FACA. She noted the long tradition of advice to the Federal government. Today, there are over 1,000 Federal advisory committees. NASA's advisory committees have fluctuated from two (at present) to 26. Ms. Rausch discussed the nature of advisory committees, when FACA applies, and requirements of the FACA. Advisory committees can be established by statute, the President, or a Federal agency. She referred Council members to the Council charter. Mr. Chris Blackerby is the Designation Federal Official (DFO) and Executive Director of the Council. Basic requirements of the law include: a charter, a balanced membership (with regard to points of view), public meetings, formal minutes, opportunity for public filing of written statements, announcement of meetings in the Federal Register, and maintenance of all committee documents for public inspection. In addition, every Federal agency is required to have an ACMO and each FACA advisory committee must have a DFO. There are two types of advisory committee members, "Special Government Employees" (SGEs) and "Representatives." All of the Council members are SGEs.

In response to a question regarding subcommittees, Ms. Rausch indicated that Subcommittees that are deliberating and intend to report recommendations back to the Committees should have public meetings with the exception of some fact-finding meetings. NASA's policy is that Subcommittees will act in full compliance with the FACA, even though they are not chartered under the law. Ms. Rausch highlighted the process and conditions for closed meetings and "non-FACA meetings." She noted that the Administrative Session on the second day would be a non-FACA meeting—it is a purely administrative session. Ms. Rausch agreed that vetting Committee findings and recommendations through the Council is a good process to use. Key FACA regulations and policies can be found in 41CFR Parts 101-6 and 102-03, and NASA Policy Directive 1150.11. The purpose of the Council is to advise; only Agency officials can make decisions and implement policy and directions. Ms. Rausch noted that there will be a NASA website for the Council, but it is currently in under construction. In response to a question, Mr. Robert Flaak, Director of the

Committee Management Secretariat in GSA's Office of Government Policy, noted that some agencies accept the advisory committee reports and some don't. Many of the recommendations are not adopted in any way whatsoever. He and his staff are working with agencies to help them improve the ways that recommendations are implemented. In response to a question about liability, Mr. Andrew Falcon from NASA's Office of General Counsel, noted that advisory members, as SGEs, are probably not liable for their decisions; however, the final determination is subject to the Attorney General.

### ***Ethics Briefing***

Mr. Michael Wholley, NASA General Counsel, introduced Mr. Andrew Falcon, from the Office of the General Counsel, and emphasized his Office's proactive support to the Council. Mr. Falcon provided the ethics briefing for SGEs serving on the Council. He discussed the appointment as an SGE and what it means—SGEs are subject to ethics rules and post employment rules. The Agency has an obligation to work with the Council to ensure that it follows the ethics rules. He emphasized that potential issues must be worked in advance, and the Council's first line of defense is the DFO, Mr. Blackerby.

Mr. Falcon discussed representational conflicts and how they apply to SGEs, financial conflicts, and post-employment restrictions. Where there is a potential conflict, the Council member needs to have a conversation in advance with the Office of General Counsel to see what options may be available. In response to a question regarding stock trading, Mr. Falcon recommended that people talk to him first on an informal basis if the stock is with companies in the NASA contractor base. The formal statutory obligation is the Financial Disclosure Statement, and the General Counsel Office will review those statements. Mr. Falcon and his colleagues will work with the Council in advance to ensure that there is a plan for avoiding conflicts of interest. The simple solution for all of the restrictions is to avoid participating personally and substantially in particular matters in which the party has a substantial interest. Mr. Falcon provided contact names and numbers in the Office of General Counsel and encouraged Council members to call any of the contacts if they have questions or concerns. The most important point for the members to keep in mind is awareness of his or her personal and professional activities outside NASA and what topics will be coming up on the Council agenda. The trickiest question that often arises is when something is a "particular matter." Senator Schmitt indicated that as

soon as the list of Council topics is finalized, he would like Mr. Falcon to review it.

### ***Exploration Systems***

Dr. Scott Horowitz, Associate Administrator for the Exploration Systems Mission Directorate (ESMD), provided an update on the Exploration Systems Architecture. He reviewed the Vision for Space Exploration (the Vision) that was announced by the President in January 2004. The Exploration Systems Architecture Study (ESAS), completed in summer 2004, looked at a number of options in developing an overall architecture and plan. The first step is the Moon – learning how to operate away from low Earth orbit (LEO) as well as developing technologies such as crew and cargo launch vehicles, the Crew Exploration Vehicle (CEV), and Mars ascent and descent propulsion systems. In addition, fundamental science will be conducted. The first two missions will be part of the Robotic Lunar Exploration Program (RLEP), and will include (1) a Lunar Reconnaissance Orbiter (LRO) and (2) an RLEP-2 Lander.

Dr. Horowitz discussed the CEV. There has been considerable debate about what the CEV should be. Studies have concluded that a blunt body capsule is the safest, most affordable, and fastest approach. The Crew Launch Vehicle (CLV) design is currently a two-stage vehicle, one engine per stage, to deliver over 50,000 pounds to LEO. The heavy lift EELV, of which there are two, the Delta IV and Atlas V, has a 125 metric ton lift capacity. In response to a question regarding the EELV, Dr. Horowitz stated that the design document is stable and is a good starting point. Currently, Marshall Space Flight Center (MSFC) is the lead integrator for the CLV; one of the next developments is the Earth departure stage. The J-2S engine is out of production, and this type of engine would have to be developed or brought back to life. NASA does not have the budget for two parallel paths. The plan is to complete the second stage. The Lunar Lander and Ascent stage are further into the architecture and are represented conceptually at this time. The descent stage is baselined as a hydrogen/oxygen system. In response to a comment, Dr. Horowitz indicated that different chemistries are being examined and trades are still being done. Much of the funding for the Prometheus program (nuclear thermal propulsion) has been reduced in order to get the launch vehicles ready. Two classes of nuclear propulsion are needed, in-space and surface, but there are insufficient funds to support a nuclear rocket engine at this time. Dr. Horowitz stated that his principles are: start off with bite-size pieces, have good testing opportunities, have

good, solid requirements, and don't make changes unless absolutely necessary.

Dr. Horowitz showed the current Exploration Systems organization and discussed basic organizational roles. In response to a question, he noted that there hasn't been a decision on whether Johnson Space Center (JSC) will select a lead systems integrator or do the job themselves. Program Management is at the field Centers: the Constellation Systems Program is being led by JSC; the RLEP is being led by Ames Research Center (ARC); the Human Research Program is being led by JSC; and the Technology Development Program is being led by Langley Research Center (LaRC). In response to a question,

Dr. Horowitz indicated that the budget is currently under review. Senator Schmitt added that the Council should know something about the 2007 budget before the next meeting. In response to a question regarding launch costs, Dr. Horowitz noted that there have been a number of cost studies related to launch cost per pound. Some estimates indicate that a cost of \$3000/lb. is achievable. Future space flight must be worthy of the expense, difficulty, and risks. We need to build beyond our current capabilities, lower costs, and do it more reliably and safely. The goal for the new launch vehicle is better than one accident in one thousand launches.

Steps must be evolutionary, incremental, and cumulative. A committed and long-term lunar effort is needed. The ESMD has aggressively adopted the recommendations of the ESAS study team and is doing everything possible to accelerate the CEV to reduce the gap in US human space flight capability. Programs are refocused toward near-term needs. The ESMD organization has been streamlined at Headquarters and Program and Project offices have been established at the field Centers.

In response to a question regarding foreign technologies, Dr. Horowitz observed that in terms of being able to go to the Moon and back, from an engineering standpoint, the Chinese are about 6 years ahead of us. Dr. Tyson stated that the baseline approach was not adequately communicated to the public, i.e., why this Vision is different than what we did before. Dr. Horowitz agreed that NASA has a perception problem and needs to do better. He invited the Council's help in addressing the problem.

In response to a question, he indicated that he would like to have a significant test of the launch system in 2008. Hopefully, the commercial

world will take over some of the more routine services. There is sufficient technology to land on the Moon, but additional technology is needed to make it better. Mars is at the edge of our reach with current technologies. Chemical rocket engines can just barely get us to Mars, but not beyond.

Senator Schmitt qualified that by adding that we really don't know how to do descent landing on Mars. He commented that one of the things that the Council may want to look at is the peril of under funding a program. For example, a lot of the issues on Shuttle are related to under funding. Dr. Horowitz replied that in terms of architecture, NASA has not given up anything for the first step (the Moon) because of cost constraints; however, for Mars, the nuclear thermal engine has been deferred. Senator Schmitt observed that a lot of work was done under the Apollo program for sustained activities on the Moon. Mr. Colladay commented that the fear is that the gap in human space flight will widen. In response to a question regarding fallback options or alternatives around the gap, Dr. Horowitz stated that there is no alternative if the Shuttle is retired in 2010. We must use all of our resources to ensure that another vehicle is ready to go. For Station, services can now be purchased from Soyuz. Dr. Fisk noted that another unfortunate consequence of the budget constraints is fall off of interest by graduate students, who are the future workforce. Dr. Huntress added that we must do something worthy when we get there. Dr. Horowitz agreed and stated that he is working with Dr. Cleave to formalize arrangements to get "buy-in" from the science community.

### ***Shuttle/Station Operations***

Mr. William Gerstenmaier, Associate Administrator for the Space Operations Mission Directorate, provided an overview of the Space Shuttle and the International Space Station (ISS) Programs. The ISS partnership has been extremely strong and international cooperation has been outstanding. About 50 percent of the ISS assembly is complete from a mass standpoint. The remaining US elements are flight-ready at Kennedy Space Center (KSC). The problem is the delivery system to orbit. Mr. Gerstenmaier showed the Shuttle processing, launch to landing, and noted that it is an integrated, complicated system. The Exploration architecture is much simpler. The real challenge in the "gap" is retention of workforce and expertise at the smaller subcontractor level. The next major activity on Station is a cargo supply vehicle undocking on Dec. 20. Each of the planned Shuttle flights is full of activity—cargo and work crew.

Mr. Gerstenmaier discussed the launch vehicle capabilities for the Station. When the Shuttle is retired in 2010, a lot of upmass and capability will be lost. NASA is in the process of trying to get commercial services to bridge the gap to the CEV. About 15 flights are needed for assembly (with logistics/spares, etc. the number of flights is 18). As the Shuttle is retired, the ISS logistic system must migrate from a “repair and return” to a “build and burn” concept. Some components must be redesigned to support the new spares philosophy. There is synergy between the redesign activity and what Exploration needs for the future. In response to a question, Mr. Gerstenmaier noted that the ISS has a lot of capability for commercial users; the problem is the transportation aspect.

Mr. Gerstenmaier provided an overview of the Shuttle External Tank (ET). On the outside of the tank, there are about 4,800 lbs. of foam. Prior to Return to Flight, there were a number of modifications to the ET. Everything that was redesigned, except the bipod fitting, worked exactly as expected. NASA was surprised about the STS-114 foam debris events. The major area being worked is the LH2 Protuberance Air Load (PAL) ramp. Mr. Gerstenmaier described the latest results from ET troubleshooting and testing. To fix the problem, the Program is looking at redesigning the area or flying without the PAL at all.

Hurricane Katrina damaged some assets and slowed down processing. However, the Michoud workforce was tremendously motivated and were willing to make personal sacrifices to get the work done. About 90 percent of the workforce is back on the job.

The Shuttle ETs, solid rocket motors, and Space Shuttle Main Engine (SSME) will jump-start the EELV for Exploration as well as “buy down” risk. Workers can transition from their current Shuttle job to Exploration. NASA has evaluated the applicability of the Return to Flight (RTF) Task Group minority reports and has undertaken four broad Agency actions: set clear achievable expectations and hold people accountable; return to classic program management and rigorous system engineering principles; assign managers that have a solid foundation of engineering attributes; and eliminate prejudices and barriers to learning from mistakes. Mr. Gerstenmaier acknowledged that it would be a long-term process to affect some of these changes. People with solid engineering attributes are on the job now. However, there may be a problem if the next generation of engineers and managers are not available. The workforce is very important

to the success of the program. In response to a comment, Mr. Gerstenmaier agreed that in the past, NASA has outsourced too much of the core system engineering capability and is working on getting that core capability back. It is important for the operations team to work hand-in-hand with the development team.

Mr. Gerstenmaier noted that NASA has a solid plan in place for the next Shuttle flight (STS-121) in May. The Shuttle needs to return to a 90-day turnaround to meet the manifest and complete ISS assembly. Out year funding (FY 2009 and 2010) is a concern for Space Operations. NASA is developing a transition plan with ESMD to transfer operational experience into the development cycle. The Shuttle-derived exploration vehicles provide essential continuity between current and future systems.

In response to a question about downmass, Mr. Gerstenmaier noted that NASA can still deliver hardware to Station and dispose of the old hardware. However, there will be more *in situ* type of research or *in situ* repair rather than return. Station can be used as a testbed for exploration for *in situ* types of activities.

Russia is looking at replacing Soyuz with a new vehicle around 2014, but there may be funding issues. In the long term, the exciting aspects of the mission are developmental research, Mars analogy experiments, etc. These are in the process of being put into the mission plan. Mr. Gerstenmaier indicated that he could discuss specific budget details after the budget is released in February. There is a plan to decommission the ISS in 2016; however, the Station physical hardware will last well beyond this timeframe. With respect to the schedule, Mr. Gerstenmaier indicated that the 18 flights to assembly complete are very doable. The Program will start demonstrating this year and see how things go. Schedule cannot be ignored, but it will not be a driver. In response to a question, he indicated that NASA has some “plan B” options.

### ***Audit and Finance***

Ms. Gwendolyn Sykes, NASA’s Chief Financial Officer (CFO), provided an overview on the Office of the Chief Financial Officer (OCFO). She focused her presentation on financial management and audit statements. Ms. Sykes compared the organizational structure in 2002 with that of today. In the old structure, there was a dichotomy between the accounting and finance side and the budget side. The first change was to ensure stability and continuity

of operations. The OCFO now has strategic goals. In 2002, each Center had its own financial system; today, there is one core system, and financial statements come directly out of the system. In the future, there will be a need to put a lot more reporting into the hands of Financial and Program Managers.

Ms. Sykes noted several areas of budget improvements. The Program Planning and Budget Execution System (PPBES) is being implemented for the FY 2008 budget process. The funds distribution process is being streamlined to support Mission execution. For 2004, the external auditors (under contract to the Inspector General) have identified two material weaknesses and one reportable condition. Significant strides have been made in the intragovernmental fund balances with the US Treasury. Another area that represents a challenge is property. Property, plant, and equipment represents 75% of the balance sheet assets. Ms. Sykes noted that the reportable condition, "environment liabilities," can be resolved. NASA changed its way of estimating its environmental liability, and there was a training issue with the new tool.

The PPBES will be an essential part of the budgeting process, and will enable timely budget decisions and provide for tracking of those decisions. In response to a question, Ms. Sykes noted that a separate organization-- Program Analysis and Evaluation (PA&E)--does the program analysis. With respect to the accuracy and timeliness of information at the project level, NASA is moving forward and is in much better shape than it was in 2002. There is one core financial system as well as standards for the accounting operations. NASA is now (FY 2006) operating in the new program and project structure. Under the old accounting system, there were 120 subsystems. Today, the new SAP Core Finance is one single transaction-based accounting system. It is housed at MSFC. This system is being used in other agencies, e.g., the IRS. Gen. Lyles noted that the President's Commission recommended an independent cost analysis function. Ms. Sykes indicated that this is now part of PA&E. In conjunction with the core finance system, there is a single labor distribution system (time and attendance, etc.). Senator Schmitt noted that the Council should probably get a briefing from Scott Pace, who leads PA&E. The new system was implemented in stages, but implementation was completed in one fiscal year. For historical data, the legacy system must be kept in maintenance mode, but no new data is being put into it. Senator Schmitt noted that some of the NASA facilities were at risk because of the use of full cost accounting

for those facilities. Ms. Sykes indicated that her office is reviewing that and looking at what makes sense. With respect to property, plant, and equipment, a considerable amount of material is in the hands of contractors. This is one of the challenges.

Another area of dialogue is the capitalization policy and process. NASA has used the Defense Contract Audit Agency (DCAA) to do property audits at contractors' facilities. NASA is developing a corrective action plan to address the Audit findings. This plan will be available to the Council. The responsible parties are also working as a team to respond to the 45 GAO recommendations. In response to a question, Ms. Sykes indicated that she has hired 34 people into her organization over the past 6 months. She has been working with human resources to use hiring flexibility to bring qualified people on board. Dr. Fisk encouraged Ms. Sykes to put in place an organized process to evaluate the system at the working level, and determine whether the ultimate customers are satisfied that the system serves their needs. In response to a question, Ms. Sykes indicated that she has the equivalent of an internal audit team—the office of quality assurance within her organization. Dr. Levy observed that one of the big impediments to financial management of programs is NASA's inability to project costs accurately. Ms. Sykes indicated that she is working with the programs to provide the analytical tools that will address this issue. In response to a comment, she noted that she has regular interchange with the CFO's in other agencies.

Senator Schmitt adjourned the day's meeting at 5:00 p.m.

**NASA ADVISORY COUNCIL**  
**Dirksen Senate Office Building, Washington, DC**  
**November 30, 2005**

Senator Schmitt called the meeting to order at 8:00 a.m. and announced that this was a public meeting, being held in accordance with the FACA. The public session would end at 1:00 p.m. Senator Schmitt thanked the staff of the Senate Commerce Committee and the Dirksen Building for use of the facility and their support.

*Science*

Dr. Mary Cleave, Associate Administrator for the Science Mission Directorate (SMD), introduced Dr. Mario Livio from the Hubble Space Telescope Science Institute. He discussed some interesting highlights from the Hubble science program: the accelerating universe and dark energy; the distance scale and the age of the universe; the evolution of galaxies and cosmic star formation rates; and the composition of extrasolar planets. Perhaps the greatest achievement of Hubble is that it has brought the universe to the homes of people around the world. Dr. Livio showed a few of the Hubble images. Gen. Abrahamson requested that the presentation, with the images, be made available electronically to the Council members.

Dr. Cleave discussed the Science Program. The Program has a long history of excellent work, and this history is drawn upon for future work. The Directorate will be reorganized into four divisions: Astronomy and Physics (formerly the Universe); Heliophysics (formerly Sun-Earth and part of the Earth science group); Planetary Science (formerly Solar System); and Earth Science (formerly a separate enterprise). A number of key questions drive the science in each Division. For each Division, Dr. Cleave noted some recent highlights, technology priorities, and “hot topics.” She emphasized that the SMD works very closely with the science community in developing roadmaps. Dr. Cleave invited Council suggestions on an alternative name for the “Heliophysics” Division. The Mars group and Moon group are included within the Planetary Science Division, as is the planetary protection work. In response to a question, Dr. Cleave noted that Earth history (geologic) is under the National Science Foundation (NSF). However, the Climate Change Initiative is an interagency group in which NASA is a key player. In response to a question, Dr. Cleave explained the National Polar Orbiting Environmental Satellite System.

Dr. Cleave showed the SMD flight missions by phase—formulation, implementation, and operations—and a summary of planned launches CY2005 – CY2010. She emphasized that the planning process both directly and indirectly involves the community. The SMD will look to the Science Committee of the Council for tactical advice on implementation of strategic priorities. Each of the Science Divisions will have a Subcommittee, and findings and recommendations of those Subcommittees will come to the Council through Dr. Kennel, the Chair of the Science Committee. In response to a comment, Dr. Cleave noted that there are issues with cost growth, particularly within the small cap missions. The SMD is trying to manage missions within their budget lines. There has been a lot of change over the past year, but the essentials remain the same: the strategy is driven by science questions, selections are based on an open, competitive process; there is continuous technological advancement; and there are domestic and international partnerships.

In response to a question, Dr. Cleave stated that technology readiness is carefully examined to see whether a program is ready to move forward. With respect to impact of the Shuttle “gap” on SMD, Dr. Cleave indicated that SMD is working on how it will be aligned with the Exploration group. SMD provides the Program and Project Scientists for the Exploration Lunar missions. The Exploration Systems Mission Directorate (ESMD) provides the engineering. Budgets are currently under discussion. Dr. Griffin has stated that he wants a robust science program. However, there will be changes in priorities in the portfolio.

In response to a comment, Dr. Cleave noted that the SMD has a formal process for mission extension. There is a peer review, and all projects in mission extension must submit proposals. The peer reviewers evaluate the proposals and provide advice with respect to which missions should continue. For strategic inputs, the SMD relies on the National Academy of Sciences. In response to a question about life sciences, Dr. Cleave indicated that this science is not in her portfolio. Life sciences moved into the ESMD. Dr. Logsdon observed that when life sciences moved to the ESMD, it became focused on bioastronautics.

In response to a question about the organization, Dr. Cleave indicated that the SMD is reorganizing, coordinating business functions, and separating two science groups. The proposed changes are vetted through the

community and NASA management. NASA's investment in the Heliophysics Division is about \$700 million at the top level. The Prometheus program is a joint program with DOE, but the research in this program has been scaled back. There is no fusion program at the present time. Dr. Cleave noted that the SMD works on Space Weather, but there haven't been discussions with Exploration about other space hazards.

In response to a comment on out-year budget constraints, Dr. Cleave noted that SMD is struggling with out-year budget challenges. SMD is trying not to eat the "seed corn." Priorities come from the Academy's Decadal studies, but SMD considers the balances between mission portfolio and research and analysis (R&A).

In response to a question, Dr. Cleave explained how the decision was made on Hubble. The James Webb Space Telescope (JWST) will carry the investigations further than HST. It does not duplicate all of the things that HST is doing now. Dr. Colladay observed that it appears that there is an attempt across the Agency to get more fidelity in the up-front cost estimates. Dr. Cleave agreed and noted that her Directorate is working very hard on cost estimates.

Within Space and Earth Sciences, there has been an independent assessment team, and SMD is continuing that tradition. The challenge is in the Principal Investigator (PI) cost-cap missions. The SMD is working very hard on the Announcement of Opportunity (AO) process by funding up-front assessment studies and using the "down-select" approach. With respect to names of the Divisions, Dr. Tyson suggested "Astrophysics" rather than "Astronomy and Physics." In response to a question regarding value obtained through grants, Dr. Paul Hertz explained that the grant "deliverable" is through publication in peer-reviewed journals. The feedback mechanism is the peer review process. All awardees submit annual reports and subsequent year funding is conditional upon this report and appropriate progress being made. The portfolio is constantly being re-evaluated. Peer review and input from the community is used to identify priorities moving forward. A very small fraction of grants are unsolicited. Research solicitations are very broad.

In response to a question, Dr. Cleave indicated that SMD is not supporting fundamental biology at the present, although a small fraction of the grants go to astrobiology. The technology portfolio is highly competed.

Senator Schmitt asked the Council to take an action to get a briefing from NASA's patent counsel, specifically on the current situation regarding licensing. With respect to supercomputing, Dr. Cleave noted that there is a group at the Ames Research Center (ARC) and a more focused group at the Goddard Space Flight Center (GSFC). Dr. Fisk raised the issue of cost growth in programs during the execution phase. Dr. Cleave agreed that SMD worries about this. As a result of the change in administration, NASA is taking a fresh look at the Independent Technical Authority (ITA) and how it assists projects. Another area under scrutiny is program/project management governance.

Senator Schmitt raised the question of dialog with the ESMD regarding the lunar program. Dr. Cleave noted that she is in active discussion with Dr. Horowitz regarding this program. SMD will approach payloads through the AO process. As noted earlier, SMD provides the program and project scientists to the lunar program. The Directorate does not pay part of the launch costs on foreign launch vehicles. All international programs are on a "no exchange of funds" basis. SMD works with the US launch industry and DOD on expendable launch vehicles.

In response to a question, Mr. Luther commented on the International Traffic in Arms Regulation (ITAR)—it produces a difficult and arduous process, but is not insurmountable. SMD is actively working with the Centers on the ITAR process.

Gen. Lyles asked about the United Launch Alliance and whether NASA has been involved. Mr. Luther noted that the actual dialogue with the DOD takes place through the Space Operations Mission Directorate. There are still a lot of questions to be answered about what will happen in the long run. In the near term, there is an infrastructure as well as a vehicle problem, and NASA is in dialog with DOD about these issues.

In response to a question about longer term thinking on the relationship between robotic and human exploration, Dr. Cleave noted that she expects to work with the Council on this question.

### ***Human Capital***

Ms. Toni Dawsey, Acting Director of the Office of Human Capital Management (OHCM), provided an overview of the human capital program and discussed challenges and activities underway. OHCM at Headquarters

has a corporate role. The Human Resources Offices at the Centers have an operational role. Together, they work to support Center-specific and overall Agency needs. NASA is in the process of major workforce transformation to implement the Vision for Space Exploration and other NASA missions. In the short-term, OHCM and the Centers are addressing uncovered capacity among the Centers, the Shuttle Program transition, and reshaping the Aeronautics Program. In the long-term, the organization is working to ensure the workforce is viable to support the Vision. At the beginning of last year, there were about 2,000 uncovered FTE. After the President announced his Vision, OHCM began working on the challenge—through buy outs, restricting outside hiring, job fairs at Centers with uncovered capacity, and transition counseling. As a result, 650 people took buy-outs and 95 employees were reassigned through the job fairs. NASA is currently running a third round of buy-outs and about 400 employees are expected to take them. NASA has been complimented by the Hill on its conscientious use of buy-outs. In addition to the third round of buy-outs, the senior leadership has initiated a more aggressive plan to further reduce uncovered capacity while working to maintain in-house core competencies that are needed to carry out the Vision.

NASA has also looked at the Headquarters function and has performed an institutional review to look at those functions that should be performed at field Centers. NASA has also implemented tighter hiring guidelines. The workforce team has met with Center management to identify which Centers have the engineering, technology, and research capacity to accept work packages. In addition, there is another project team looking at current and new work outside the Exploration architecture that can be packaged and sent to Centers that have excess capacity. The goal is to have an equitable distribution of work and ten healthy Centers. This activity is scheduled to be completed in June 2006. With the movement of work packages, NASA believes that reduction in force may not be necessary. The organization is optimistic about the results of all of the rebalancing efforts.

Dr. Fisk commented that the impact on employment area is broader than civil service—it includes contractors. Ms. Dawsey noted that there is a study underway that includes contractors, but she was not prepared to discuss the details of the study at this time. She acknowledged that contractors play a key role in NASA, and will continue to do so. However, it is expected that a lot of design work will come back to NASA. The transition team is looking at the composition and size of the workforce.

Although NASA is planning to continue the new hire pipeline, there is a temporary halt to that at present. NASA needs to continue to bring in expertise in the areas of the Exploration Vision and ensure leadership for the future. After June, NASA will decide where and how it will recruit. If JSC and KSC cannot recruit within NASA, they can get waivers to hire from the outside.

In response to a question from Ms. James, Ms. Dawsey indicated that she has been Acting in her position since October 1; there should be a permanent person in the position by January.

The Systems Engineering and Institutional Transitions Team (SEITT) is developing and documenting the long-term workforce strategy. Human Capital representatives, both at Headquarters and field centers, are on the SEITT. In addition to identifying workforce competencies, the team is identifying transition strategies and flexibilities to facilitate the transition of the workforce to future Agency needs. Dr. Tyson noted that numerical charts that showed progress (e.g., dollars saved by buy-out) would be helpful at future meetings. Mr. Montelongo added that he would like to see a presentation of the comprehensive strategy at a future meeting.

Mr. Ralph Thomas provided an overview of NASA's Small Business Program. He stated that three-fourths of the black caucus and half of the Hispanic caucus now support the space program. This came out of the Agency's commitment to diversity of workforce and the role of small and disadvantaged businesses. Mr. Thomas discussed how small disadvantaged and women-owned businesses have contributed to Return to Flight and completion of the ISS, and are contributing to the building of the CEV, the return to the Moon, and sending humans to Mars and beyond. The mission of the Office of Small and Disadvantaged Business Utilization (OSDBU) is to provide expertise on the utilization of innovative small businesses that can deliver technical solutions in support of NASA's Vision for Space Exploration. The goal is to increase the quantity and quality of contracts and subcontracts going to all categories of small businesses and institutionalize best practices for small and disadvantaged business utilization.

NASA has a training program for small businesses in technology, a science forum for small businesses, a Space Science symposium for small business, a Mentor Protégé Program, and sponsors numerous conferences and seminars. The Office has internal and external oversight, e.g., a roundtable

with participants from prime contractors. NASA has set records on awards to small business and minority direct awards. NASA has an 8% small disadvantaged goal, but last year did 18.4%. NASA has received major accolades from a wide array of entities. Mr. Maddox commended Mr. Thomas on the exceptional work that he has provided to NASA over the years. He noted that before Mr. Thomas came to NASA, minority and women-owned businesses in the U.S. didn't have equal opportunity to perform contracts at NASA, and Mr. Thomas integrated minorities and women into NASA's goals. Mr. Thomas observed that it was a team effort—everyone worked together to make it happen.

In response to a question, Mr. Thomas noted that there is a large subcontract base, and NASA has started a uniform methodology for determining the percentage of subcontracts on prime contracts. NASA subcontracts a higher percentage (slightly over half) of contract dollars to small, minority, and women-owned businesses than any other agency. NASA has had a high success rate of 8(a) graduates, exactly the opposite of the government as a whole. Gen. Lyle observed that in many cases, the real workforce in the minority business does not fall into the minority category. This is a concern. Mr. Thomas agreed that his organization has been concerned about that and it is something to focus upon. Sometimes the Agency is a driver of the staffing. However, many minority owned companies work hard to bring minorities in.

Ms. Angela Diaz discussed NASA's Education Program. NASA is not the Department of Education or the National Science Foundation, but has a unique niche for its education activities. NASA is taking a very strategic look in terms of workforce, and the ultimate goal of NASA Education is the future workforce. NASA's unique niche in terms of capturing individuals is inspiration. NASA is recognized around the world for doing exciting things. NASA works closely with other mission agencies and the White House to increase capability and capacity in science and technology. Ms. Diaz showed the Office of Education funding by program for FY 2006. The investment is predominantly higher education. The other mission directorates have a comparable amount invested in education and outreach. The Administrator has charged the Office of Education (OE) to put together a detailed implementation plan that will provide a look at NASA's education program. It will be aligned to the Strategic Plan, have clearly aligned goals and objectives, and inventory what exists in the portfolio today. This comprehensive inventory should be available to the Council early next year.

Ms. Diaz showed the growth in the number of designated projects (earmarks) over the past 10 years. The two major challenges are developing the education portfolio—aligned with NASA’s Vision, and the Congressional priorities and working with them to align their interests with NASA’s Vision. In response to a question regarding what NASA has been doing during the “stand-down” phase, Ms. Diaz discussed the Pathfinder program (educator/astronauts) and the NASA Explorer Schools (middle schools, working with educator teams). Similar activities are planned for the robotic side. Most of the schools are identified through competition. In response to a question, Ms. Diaz indicated that NASA has a relationship with the Challenger Learning Centers. NASA tends to work with major organizations, e.g., the National Science Teacher’s Association, and other national and state affiliates to provide content that they can apply to their curriculum. A number of the states’ governors are convening science and technology (S&T) education summits. They recognize the importance of engaging NASA and other players to inspire their students in science and technology. NASA has a “strategic communications group” that includes the offices of legislative affairs, public affairs, external relations, and education.

### ***Aeronautics***

Dr. Lisa Porter, Associate Administrator for Aeronautics, provided an overview of the activities in the Aeronautics Program. She discussed the “big-picture” implementation strategies: conduct long-term, focused, cutting-edge research that is strongly integrated; have long-term research with milestones and short-term products; and get away from “stove-piping.” Research should be leveraged across projects and across Centers. The new program names are: Fundamental Aeronautics, Aviation Safety, and Airspace Systems. Fundamental Aeronautics will invest broadly and deeply in the core competencies of aeronautics in all flight regimes. There will be four thrust areas: hypersonics; supersonics; subsonics: fixed wing; and rotorcraft. It will address both the basic underpinning research as well as multidisciplinary research.

The Aviation Safety Program will focus research in areas appropriate to the unique capabilities of NASA. The projects will be Integrated Vehicle Health Management, Aging Aircraft, Integrated Resilient Aircraft Control, and Integrated Intelligent Flight Deck Technologies. The Airspace System

Program is being realigned to address the Air Traffic Management R&D needs of the Next Generation Air Transportation System (NGATS).

Aeronautics intends to invest heavily in fundamental, foundation research. The research must be integrated, and the organization is in the process of developing plans across the portfolio, where every milestone is linked to everything else. The research portfolio will be highly integrated and very robust at the base. Aeronautics will reinvest in in-house expertise, form strong partnerships with universities, and shift the industry partnerships from near-term, evolutionary procurements to long-term intellectual partnerships, particularly at the system level. Aeronautics will have much more detailed program plans and will be presenting these plans at the AIAA in January.

Dr. Collaway observed that what universities need is money and stability; what industry needs is confidence that proprietary information is protected. The question is whether there will be enough funds to provide stability, and whether there will be mechanisms to protect proprietary information. Dr. Porter indicated that there will be funds, and proprietary information will be protected. However, any research that the government funds should be broadly available throughout the industry. Dr. Porter indicated that she would call on the Council for help—specifically, recruiting Council members to assist with peer review of proposals for NASA/industry partnerships.

With respect to partnerships with other agencies, Dr. Porter noted that she has met with the Chief Scientist of the Air Force and has a meeting scheduled to display NASA's plan. Dr. Porter stated that it is her plan to partner with the Air Force and other agencies to the greatest extent possible. She wants to strengthen the alliance with DOD regarding wind tunnels. In response to a question about NGAST, Dr. Porter indicated that Aeronautics is working very closely with the government partners. She stated that she was not aware of problems associated with the ethics rules for government employees vis-à-vis industry partnerships.

Industry consortia will be working with NASA at NASA field centers, but people will be employed by the consortia. In response to a question regarding “stove-piping”, Dr. Porter stated that there have been a series of workshops with the Centers, and plans have been developed that are dispersed across Centers. The three program directors are working together to help each other to ensure that effort is not duplicated and that there is

sufficient coverage. The Directorate is also going to a PI concept. The FY 2006 budget for Aeronautics is \$912 million.

In response to a comment, Dr. Porter stated that wind tunnels provide experimental data, and they will not be replaced by computational models as long as she is in the job.

With respect to the budget and whether it is adequate, the Aeronautics Research Mission Directorate (ARMD) is in the process of prioritizing what it needs to do and can address the budget question when that process is complete. Dr Porter indicated that she was concerned about core competencies when she came on board, and has already course-corrected to some degree. ARMD is working with the Centers on this challenge. The intent in working with universities is to be completely open. ARMD will go after the best and brightest wherever they may be. Dr. Porter stated that she didn't foresee problems with cooperative research programs. NASA, industry, and academia should be able to work together under the research umbrella. At the base of the research pyramid, ARMD is considering what it takes to support the NASA Vision.

In response to a question, Dr. Porter noted that Aeronautics is putting together a strategic plan to address wind tunnels over the long term. The National Aeronautics Policy will address some of the issues raised by the Council members. Congress has given her group a year to put this policy into place.

Senator Schmitt adjourned the Public Session at 12:30.

**NASA Advisory Council Meeting  
November 29-30, 2005  
Washington, DC**

**Tuesday, November 29**

Location: Rayburn House Office Building, Room 2318

- |            |   |  |
|------------|---|--|
| 8:00 a.m.  | NASA Administrator's Remarks                                | <i>Michael Griffin</i>   |
| 8:10 a.m.  | Chairman's Opening Remarks                                  | <i>Hon. Harrison Schmitt<br/>Council Chairman</i>  |
| 9:30 a.m.  | Break   |  |
| 9:45 a.m.  | Federal Advisory Committee Act                              | <i>Ms. Diane Rausch<br/>Advisory Committee<br/>Management Officer,<br/>Office of External<br/>Relations</i>          |
| 10:15 a.m. | Ethics Briefing   | <i>Mr. Michael Wholley<br/>General Counsel</i><br><br><i>Mr. Andrew Falcon<br/>Office of the General<br/>Counsel</i> |
| 11:15 a.m. | Lunch   |  |
| 12:30 p.m. | Exploration Systems Architecture<br>Overview and Discussion | <i>Dr. Scott Horowitz<br/>Associate Administrator,<br/>Exploration Systems<br/>Mission Directorate</i>               |
| 2:00 p.m.  | Shuttle/Station Operations<br>Overview and Discussion       | <i>Mr. William Gerstenmaier<br/>Associate Administrator,<br/>Space Operations Mission<br/>Directorate</i>            |
| 3:30 p.m.  | Break   |  |



11:30 a.m. Aeronautics Research  
Overview and Discussion

*Dr. Lisa Porter  
Associate Administrator,  
Aeronautics Research  
Mission Directorate*

1:00 p.m. Adjournment

## NASA Advisory Council Members Separated according to committee membership

Chair	<ul style="list-style-type: none"> <li>• Hon. Harrison H. Schmitt, Apollo 17 Astronaut and Scientist</li> </ul>
Aeronautics Committee	<ul style="list-style-type: none"> <li>• <i>Chair: Mr. Neil Armstrong, Apollo 11 Astronaut</i></li> <li>• Dr. Juan J. Alonso, Department of Aeronautics &amp; Astronautics, Stanford University</li> <li>• General Lester L. Lyles, USAF (Ret.), Consultant, The Lyles Group</li> </ul>
Audit and Finance Committee	<ul style="list-style-type: none"> <li>• <i>Chair: Mr. Robert M. Hanisee, Trust Company of the West</i></li> <li>• Hon. Edward R. McPherson, Under Secretary, U.S. Department of Education</li> <li>• Hon. Michael Montelongo, Senior Vice President, Strategic Marketing, Sodexo Inc.</li> <li>• Mr. Howard J. Stanislawski, Partner, Sidley Austin Brown &amp; Wood, LLP</li> </ul>
Exploration Committee	<ul style="list-style-type: none"> <li>• <i>Chair: Lt. Gen. James A. Abrahamson, USAF (Ret.), Aerospace Consultant</i></li> <li>• Capt. Frederick Hauck, USN (Ret.)</li> <li>• Dr. John M. Logsdon, Director Space Policy Institute, George Washington University</li> <li>• Dr. Stephen I. Katz, M.D., Ph.D., Director, National Institute of Arthritis and Musculoskeletal and Skin Diseases</li> </ul>
Human Capital Committee	<ul style="list-style-type: none"> <li>• <i>Chair: Dr. Gerald L. Kulcinski, Dean of Research, College of Engineering, University of Wisconsin-Madison</i></li> <li>• Hon. Kay Coles James, Consultant</li> <li>• Mr. Wendell Maddox, President and Chief Executive Officer, ION Corporation</li> <li>• Dr. R. James Milgram, Professor, Department of Mathematics, Stanford University</li> </ul>
Science Committee	<ul style="list-style-type: none"> <li>• <i>Chair: Dr. Charles F. Kennel, Director and Vice Chancellor of Marine Sciences, Scripps Institute of Oceanography</i></li> <li>• Dr. Wesley T. Huntress, Jr., Director, Geophysical Laboratory</li> <li>• Dr. Eugene H. Levy, Provost and Professor of Physics and Astronomy, Rice University</li> <li>• Dr. Mark S. Robinson, Research Associate Professor, Department of Geological Sciences, Northwestern University</li> <li>• Dr. Neil DeGrasse Tyson, Frederick P. Rose Director, Hayden Planetarium, Department of Astrophysics, American Museum of Natural History</li> </ul>
<i>Ex-Officio</i>	<ul style="list-style-type: none"> <li>• Dr. Raymond S. Colladay, Chair, Aeronautics and Space Engineering Board, National Research Council</li> <li>• Dr. Lennard A. Fisk, Chair, Space Studies Board, National Research Council</li> <li>• Dr. David Longnecker, Chair, Committee on Aerospace Medicine and Medicine for Extreme Environments, Institute of Medicine</li> </ul>
Members not attending	<ul style="list-style-type: none"> <li>• Mr. Neil Armstrong (Not attending November 29)</li> <li>• Dr. Wesley T. Huntress, Jr. (Not attending November 30)</li> <li>• Dr. Charles F. Kennel (Not attending either day)</li> <li>• Dr. Mark S. Robinson (Not attending either day)</li> </ul>

**Harrison Hagan Schmitt**, a native of Silver City, NM, has the diverse experience of a geologist, pilot, astronaut, administrator, businessman, writer, and U. S. Senator. He received his B. S. from Caltech, studied as a Fulbright Scholar at Oslo, and attended graduate school at Harvard. His Ph.D. in geology in 1964 is based on geological field studies in Norway. As a civilian, Schmitt received Air Force jet pilot wings in 1965 and Navy helicopter wings in 1967.

Selected for the Scientist-Astronaut program in 1965, Schmitt organized the lunar science training for the Apollo Astronauts, represented the crews during the development of hardware and procedures for lunar surface exploration, and oversaw the final preparation of the Apollo 11 Lunar Module Descent Stage. He was designated Mission Scientist in support of the Apollo 11 mission. After training as back-up Lunar Module Pilot for Apollo 15, Schmitt served as Lunar Module Pilot for Apollo 17 - the last Apollo mission to the Moon. On December 11, 1972, he landed in the Valley of Taurus-Littrow as the only scientist and the last of 12 men to step on the Moon.

In 1975, after two years managing NASA's Energy Program Office, Schmitt fulfilled a long-standing personal commitment by entering politics. Elected in 1976, and he served a six year term in the U.S. Senate beginning in 1977. Senator Schmitt, the only "natural scientist" in the Senate since Thomas Jefferson was Vice-President of the United States, was a member of the Senate Commerce, Banking, Appropriations, Intelligence, and Ethics Committees. In his last two years in the Senate, Schmitt held the position of Chairman of the Commerce Subcommittee on Science, Technology, and Space and of the Appropriations Subcommittee on Labor, Health and Human Services, and Education. He later served on the President's Foreign Intelligence Advisory Board, the President's Commission on Ethics Law Reform, the Army Science Board, as Co-Chairman of the International Observer Group for the 1992 Romanian elections, and as Vice Chairman of the U.S. delegation to the 1992 World Administrative Radio Conference in Spain.

Harrison Schmitt consults, speaks, and writes on policy issues of the future, the science of the Moon and Planets, and the American Southwest. His scientific research concentrates primarily on the synthesis of data related to the origin and evolution of the Moon and the terrestrial planets and on the economic geology of the lunar regolith and its resources. Schmitt presently is Chair Emeritus of The

Annapolis Center (risk assessment) and is Adjunct Professor of Engineering, University of Wisconsin-Madison, teaching "Resources from Space." His current board memberships include Orbital Sciences Corporation, Edenspace Systems Corporation, and PhDx Systems, Inc., and, as a retired Director, he is a Member of the Corporation of the Draper Laboratory. He is a member of the Energy Department's Laboratory Operations Board, the Maguire Energy Institute's Board of Advisors and served as co-chair of NASA's Human Planetary Landing Systems Capabilities Road-mapping effort in 2004-05. Schmitt became Chairman of the NASA Advisory Council in November 2005. He founded and is Chairman of Interlune-Intermars Initiative, Inc., advancing the private sector's acquisition of lunar resources and Helium-3 fusion power and clinical use of medical isotopes produced by fusion-related processes. Schmitt's book, "Return to the Moon – Exploration, Enterprise and Energy in the Human Settlement of Space," was published by Copernicus-Praxis in November 2005.

Schmitt's honors include 1973 Arthur S. Fleming Award, 1973 Distinguished Graduate of Caltech, 1973 Caltech Sherman Fairchild Scholar, NASA Distinguished Service Award, Fellow of the AIAA, Honorary Member of the Norwegian Geographical Society and Geological Association of Canada, 1989 Lovelace Award (space biomedicine), 1989 G.K. Gilbert Award (planetology), and Honorary Fellow of the Geological Society of America, American Institute of Mining, and Geological Society of London. Dr. Schmitt has received honorary degrees from several U.S. and Canadian Universities. In recognition of past service, the U.S. Department of State in July 2003 established the Harrison H. Schmitt Leadership Award for U.S. Fulbright Fellowship awardees.

**James A. Abrahamson** retired in 1989 as director of the Strategic Defense Initiative Organization, Office of the Secretary of Defense, Washington, D.C. He was responsible to the president and the secretary of defense for managing, directing and selecting key research and development programs designed to eliminate the threat posed by strategic nuclear ballistic missiles and to increase the contribution of defensive systems to U.S. and allied security. In concert with the Joint Chiefs of Staff and undersecretary of defense for policy, he was also responsible for the review and development of strategy and policy implications of defensive capabilities.

General Abrahamson was born in Williston, N.D., in 1933. He earned a bachelor of science degree in aeronautical engineering from the Massachusetts Institute of Technology in 1955 and a master of science degree in the same field through the Air Force Institute of Technology program at the University of Oklahoma in 1961. He completed Squadron Officer School in 1958, Air Command and Staff College in 1966, and the Industrial College of the Armed Forces in 1973.

He was commissioned as a second lieutenant through the Reserve Officer Training Corps program in November 1955 and completed pilot training at Laughlin Air Force Base, Texas, in May 1957.

In August 1961 General Abrahamson was assigned as spacecraft project officer on the VELA Nuclear Detection Satellite Program at Los Angeles Air Force Station, Calif. From October 1964 to August 1965, while assigned to the 428th Tactical Fighter Squadron, Cannon Air Force Base, N.M., he served two temporary tours of duty in Southeast Asia, where he flew 49 combat missions.

The general graduated from Air Command and Staff College as a distinguished graduate in July 1966. He then attended the Aerospace Research Pilot School at Edwards Air Force Base, Calif., and, upon graduation, served as an astronaut with the Air Force's Manned Orbiting Laboratory Program from August 1967 until it was canceled in June 1969.

General Abrahamson then served on the staff of the National Aeronautics and Space Council in the Executive Office of the President of the United States. In March 1971 he became manager of the TV-guided, air-to-ground Maverick missile program at Headquarters Aeronautical Systems Division, Wright-Patterson Air Force Base, Ohio. In June 1973 he assumed command of the 4950<sup>th</sup> Test Wing there.

In March 1974 General Abrahamson was assigned as inspector general, Air Force Systems Command, Andrews Air Force Base, Md. From May 1976 to July 1980 he served as director for the F-16 Multinational Air Combat Fighter Program, Aeronautical Systems Division, Wright-Patterson Air Force Base. He then became deputy chief of staff for systems at Air Force Systems Command headquarters.

In November 1981 the general was assigned as associate administrator for the Space Transportation System, Headquarters National Aeronautics and Space Administration, Washington, D.C. He was responsible for the nation's space shuttle program, leading it safely and successfully through 10 developmental and early operational launches. During his tenure, NASA performed many firsts, including the first satellite retrieval and repair mission that vividly demonstrated the operational capabilities of the space shuttle. General Abrahamson assumed his present duties in April 1984.

The general is a command pilot with more than 3,000 flying hours. His military decorations and awards include the Distinguished Service Medal, Legion of Merit with two oak leaf clusters, Meritorious Service Medal, Air Medal with oak leaf cluster, Air Force Commendation Medal, NASA Distinguished Service Medal, Order of King Olaf of Norway, Order of the Orange from the Netherlands and the Order of King Leopold of Belgium. He also wears the Space Badge and Command Missile Badge. General Abrahamson has received honorary doctorate degrees in engineering from New York University, Utah State University and Rensselaer Polytechnic Institute. In 1984 he received the General Bernard A. Schriever Award for outstanding achievement in support of Air Force missile and space programs. In 1986 he received the Dr. Robert H. Goddard Trophy for leadership and excellence in advancing space flight programs contributing to United States leadership in astronautics. In 1987 he was honored as Man of the Year in Science and Technology from the Achievement Rewards for College Scientists Foundation, Metropolitan Chapter, Washington, D.C.

**Juan J. Alonso** is an associate professor in the Department of Aeronautics & Astronautics at Stanford University. He joined the faculty in 1997 shortly after receiving a PhD degree in Mechanical and Aerospace Engineering from Princeton University. He is the founder and director of the Aerospace Design Laboratory (ADL) where he specializes in the development of high-fidelity computational design methodologies to enable the creation of realizable and efficient aerospace systems. Prof. Alonso's research involves a large number of different applications such as transonic, supersonic, and hypersonic aircraft,

helicopters, turbomachinery, and launch and re-entry vehicles. He is the author of over 100 technical publications on the topics of computational design, multi-disciplinary optimization, fundamental numerical methods, and high-performance parallel computing. He is also the recipient of numerous awards and fellowships including the AIAA Best Paper Award, the Stanford Chapter AIAA Professor of the Year Award, the Ray Grimm Memorial Prize in Computational Physics, and the Terman and Princeton University Honorific fellowships. Prof. Alonso is deeply interested in the development of an advanced curriculum for the training of future engineers and scientists and has participated actively in the curriculum committee for the Institute for Computational and Mathematical Engineering (ICME) at Stanford University. He holds a Bachelor of Science in Aeronautics & Astronautics from the Massachusetts Institute of Technology (MIT 1991) where he was a member of the team that currently holds the world speed record for human powered vehicles over water. Prof. Alonso serves in the AIAA Multidisciplinary Optimization Technical Committee, the CGNS Steering Committee and the Center for Turbulence Research Steering Committee and he is a reviewer for a number of archival journals. In the past, his research work has been funded by DARPA, AFOSR, the Department of Energy, NASA, Boeing, and Raytheon Aircraft among others. Prof. Alonso is an avid squash, soccer, tennis player and skier and lives in Stanford, CA with his wife and daughter.

**Neil A. Armstrong** was born in Wapakoneta, Ohio, on August 5, 1930. He received a Bachelor of Science degree in Aeronautical Engineering from Purdue University in 1955. After serving as a naval aviator from 1949 to 1952 and completing his studies at Purdue, Armstrong joined the National Advisory Committee for Aeronautics (NACA) in 1955. His first assignment was with the NACA Lewis Research Center in Cleveland, Ohio. For the next 17 years, he was an engineer, test pilot, astronaut and administrator for NACA and its successor agency, the National Aeronautics and Space Administration (NASA).

As a research pilot at NASA's Flight Research Center, Edwards, Calif., he was a project pilot on many pioneering high speed aircraft, including the well known, 4000-mph X-15. He has flown over 200 different models of aircraft, including jets, rockets, helicopters and gliders.

Armstrong transferred to astronaut status in 1962. He was assigned as command pilot for the Gemini 8 mission. Gemini 8 was launched on March 16, 1966, and Armstrong performed the first successful docking of two vehicles in space.

As spacecraft commander for Apollo 11, the first manned lunar landing mission, Armstrong gained the distinction of being the first man to land a craft on the

moon and first to step on its surface.

Armstrong subsequently held the position of Deputy Associate Administrator for Aeronautics, NASA Headquarters, Washington, D.C. In this position, he was responsible for the coordination and management of overall NASA research and technology work related to aeronautics.

He was Professor of Aerospace Engineering at the University of Cincinnati between 1971-1979. During the years 1982-1992, Armstrong was chairman of Computing Technologies for Aviation, Inc., Charlottesville, Va.

He received a Bachelor of Science Degree in Aeronautical Engineering from Purdue University and a Master of Science in Aerospace Engineering from the University of Southern California. He holds honorary doctorates from a number of universities.

Armstrong is a Fellow of the Society of Experimental Test Pilots and the Royal Aeronautical Society; Honorary Fellow of the American Institute of Aeronautics and Astronautics, and the International Astronautics Federation.

He is a member of the National Academy of Engineering and the Academy of the Kingdom of Morocco. He served as a member of the National Commission on Space (1985-1986), as Vice-Chairman of the Presidential Commission on the Space Shuttle Challenger Accident (1986), and as Chairman of the Presidential Advisory Committee for the Peace Corps (1971-1973).

Armstrong has been decorated by 17 countries. He is the recipient of many special honors, including the Presidential Medal of Freedom; the Congressional Space Medal of Honor; the Explorers Club Medal; the Robert H. Goddard Memorial Trophy; the NASA Distinguished Service Medal; the Harmon International Aviation Trophy; the Royal Geographic Society's Gold Medal; the Federation Aeronautique Internationale's Gold Space Medal; the American Astronautical Society Flight Achievement Award; the Robert J. Collier Trophy; the AIAA Astronautics Award; the Octave Chanute Award; and the John J. Montgomery Award.

**Raymond Colladay** is a retired corporate officer of the Lockheed Martin Corporation and the former President of the Lockheed Martin Astronautics company in Denver. Before entering the private sector, he held positions as Director of DARPA – the Defense Advanced Research Projects Agency - of the U.S. Department of Defense and was Associate Administrator of NASA where

he had senior executive responsibility for the agency's aeronautics and space research and technology development including operations oversight of Ames, Langley, Dryden, and Glenn Research Centers. Dr. Colladay started his aerospace career at NASA Glenn Research Center in propulsion R&D before moving to NASA Headquarters where he held a number of leadership positions before being appointed Associate Administrator of the Office of Aeronautics and Space Technology. He has been a member of the Air Force Scientific Advisory Board and various Defense Science Board summer studies. Currently, he owns an aerospace consulting company, RC Space Enterprises, Inc.; teaches leadership and ethics for the Colorado School of Mines; and serves on a number of boards, steering committees, and commissions. He received his BS, MS, and PhD degrees in mechanical engineering from Michigan State University and attended the Harvard Business School's Advanced Management Program. He is a fellow of the AIAA and of the American Astronautical Society. Dr. Colladay is Chairman of the Aeronautics and Space Engineering Board (ASEB) of the National Academies.

**Lennard A. Fisk** is the Thomas M. Donahue Collegiate Professor of Space Science at the University of Michigan, where from 1993-2003 he was Chair of the Department of Atmospheric, Oceanic, and Space Sciences. Prior to joining the University in July 1993, Dr. Fisk was the Associate Administrator for Space Science and Applications of the National Aeronautics and Space Administration. In this position he was responsible for the planning and direction of all NASA programs concerned with space science and applications and for the institutional management of the Goddard Space Flight Center in Greenbelt, Maryland and the Jet Propulsion Laboratory in Pasadena, California.

Prior to becoming Associate Administrator in April 1987, Dr. Fisk served as Vice President for Research and Financial Affairs and Professor of Physics at the University of New Hampshire. In his administrative position, he was responsible for overseeing the University's research activities and was the chief financial officer of the University. Dr. Fisk joined the faculty of the Department of Physics at the University of New Hampshire in 1977, and founded the Solar-Terrestrial Theory Group in 1980. He was an astrophysicist at the NASA Goddard Space Flight Center from 1971 to 1977, and a National Academy of Sciences Postdoctoral Research Fellow at Goddard from 1969 to 1971.

Dr. Fisk is the author of more than 180 publications on energetic particle and plasma phenomena in space. He is a Member of the National Academy of Sciences (NAS) and the International Academy of Astronautics (IAA); he is a

Foreign Member of Academia Europaea and a Fellow of the American Geophysical Union. He currently serves as Chair of the National Academies Space Studies Board; he is a co-founder of the Michigan Aerospace Corporation and a Director of the Orbital Sciences Corporation. He is the recipient of the NASA Distinguished Service Medal in 1992, the AIAA Space Science Award in 1994, and the IAA Basic Science Award in 1997.

He is a graduate of Cornell University. In 1969, he received his doctorate degree in Applied Physics from the University of California, San Diego.

**Robert Hanisee** joined TCW in 1990. He has been a member of the Private Client Services Group since 1997 where he serves as Chief Investment Officer and was in charge of Asset Allocation. From 1990 to 1996 he was Director of Research, from 1992 to 1998 he was Manager of the \$1.2BYN Convertible Securities Group, from 1992 to 1996 he was Portfolio Advisor of Large Cap Equities Investment strategy, from 1992 to 1997 he was Chairman of the Equity Policy Committee, and from 1996 to 1998 Portfolio Manager of the \$155MYN Global Telecom Trust where he was responsible for conception, implementation and management.

In January, 2004, Mr. Hanisee retired from his full time duties, but continues on a part time basis. His current TCW duties include membership on the Comprehensive Asset Allocation Committee and he continues to Chair various equity portfolio oversight committees. He continues to serve as a member of the Equity Policy Committee.

Prior to joining TCW, Mr. Hanisee was President and Director of Research for Seidler Amdec Securities, Los Angeles, CA from 1980-1990; Director of Research and a Partner at Crowell Weedon & Co, Los Angeles, CA from 1974-1980; Director of Research for Stern Frank Meyer and Fox, Los Angeles, CA from 1971-1974; Senior Analyst and Group Leader for Merrill Lynch, Los Angeles, CA from 1968-1971; and a trainee and then analyst for JP Morgan Bank in New York City from 1966-1968. From 1959-1962 he was in the US Army in Europe.

Mr. Hanisee has completed over 20 public financings, including IPO's and secondary offerings, both equity and debt, and was involved in the initial round and follow-on financing of five defense and technology venture capital startups. Mr. Hanisee has continued to be involved with each through either board

membership or financial consulting.

Mr. Hanisee has been involved with other boards and business related activities, including EDO Corporation as the Chairman of the Audit Committee, a member of the Corporate Governance and Nominating Committee, a member of the Compensation Committee, and the Chairman of the Board of Directors from 1994-1996. Since 2002, he has been Chairman of the Audit Committee and Member of the Corporate Governance and Nominating Committee for Orbital Sciences; and from 1998-2005, he was Chairman of the Audit Committee for Titan Corporation. He is also currently involved with Space Computer Corporation of LA, Marine Biotech Corporation of Beverly, MA, and Wavestream Corporation of San Dimas, CA.

In other business activities, Mr. Hanisee was a Member of the Commercialization Council at Jet Propulsion Laboratories from 1999-2001, and Chairman of the Commercialization Committee for Al Mann Institute for Biomedical Engineering from 2001-2003. Mr. Hanisee is also on the Board of Directors for the Los Angeles Master Chorale and the Symphony in the Glen, and was recently appointed to the NASA Advisory Council.

Mr. Hanisee holds a BA in Economics from California State University at Northridge and an MA in Economics from the University of California at Berkeley. He is a Chartered Financial Analyst and a member of the Los Angeles Society of Financial Analysts and the Association for Investment Management and Research, and has taught financial analysis for aspiring CFA candidates. He is a member of the Dean's advisory council, Business and Economics Dept, California State University at Northridge.

**Rick Hauck** was born in Long Beach, Calif., in 1941. He received a Bachelor of Science degree in physics in 1962 from Tufts University, where he was a Navy ROTC student. He was commissioned upon graduation and served as communications officer aboard a destroyer for 20 months. In 1964 he attended the Naval Postgraduate School in Monterey, California. Selected for the Navy's Advanced Science Program, he received a master's degree in nuclear engineering from MIT in 1966. He began flight training and received his wings in 1968. Deployed to the Western Pacific, he flew 114 combat and combat support missions in Southeast Asia off the aircraft carrier *USS Coral Sea*. Selected for test pilot training, he reported to the U.S. Naval Test Pilot School at Patuxent River, Maryland, in 1971. From 1971 to 1974, Hauck served as a project test

pilot for automatic carrier landing systems in the A-6 *Intruder*, A-7 *Corsair II*, F-4 *Phantom* and F-14 *Tomcat* aircraft and was team leader for the aircraft carrier trials of the F-14. In 1974, he reported as operations officer of Air Wing 14, flying the A-6 *Intruder*, A-7 *Corsair*, and F-14 *Tomcat* aircraft from the deck of the aircraft carrier *USS Enterprise*.

NASA named Hauck to its astronaut corps in 1978. His first flight assignment was as pilot for *Challenger* in 1983 on the seventh shuttle launch. The crew deployed two communications satellites, tested the 50-robot arm, and conducted the first formation flying of the shuttle with another satellite.

History's first space salvage mission began in 1984 when Captain Hauck and his four crew members launched aboard *Discovery* to rescue two communications satellites, *Westar VI* and *Palapa B2*, stranded in useless orbits when their kick motors failed to ignite after they were released from another shuttle. Early in the flight the crew successfully released two commercial communications satellites. They then rendezvoused with first *Palapa* and then *Westar*. After some technical difficulties, Joe Allen and Dale Gardner succeeded in corralling both and berthing them in the cargo bay for return to earth for repair and relaunch.

In March 1985 Captain Hauck became the astronaut office project officer for the integration of the liquid-fueled Centaur upper stage rocket into the shuttle. In May 1985 he was named Commander of the Centaur-boosted Ulysses solar probe mission (sponsored by the European Space Agency), scheduled to be launched in April 1986. After the *Challenger* accident this mission was postponed, and the Shuttle Centaur project was terminated.

During the hiatus following the loss of *Challenger* Hauck was asked by the NASA Administrator to serve as the NASA Associate Administrator for congressional, public, and international relations. When NASA was ready to return to flight in 1988, Hauck was selected to command a crew of five veteran shuttle astronauts to test the redesigned spacecraft. *Discovery* lifted off on September 29, 1988. During the four day mission they deployed a communications relay satellite, conducted several experiments and tested more than 200 changes made to the orbiter since *Challenger*.

Hauck left NASA in 1989 to become director of Navy Space Systems in the Pentagon. When he retired from the Navy in 1990, he entered the space insurance business. He retired again in April, 2005 after fourteen years as president and CEO of AXA Space, Bethesda, MD.

Hauck was chair of the NASA External Independent Readiness Review Team for the Second Hubble Space Telescope Servicing Mission. He was a member of the External Program Assessment Team for NASA's 2<sup>nd</sup> Generation Reusable Launch Vehicle Program, the Space Launch Initiative and the Orbital Space Plane. He has chaired a study for NASA regarding the vulnerability of the space shuttle to micrometeoroids and orbital debris, and a study regarding the measurements that must be made robotically before the first human mission to Mars.

He is a Fellow of Society of Experimental Test Pilots, the American Institute of Aeronautics and Astronautics, and the American Astronautical Society. Hauck has been inducted into the Astronaut Hall of Fame and is a National Associate of the National Academies. He serves on the boards of the Astronaut Scholarship Foundation, the Association of Space Explorers, and the U.S. Space Foundation. He is a member of the Advisory Council of the Institute of Nuclear Power Operations, the industry group that conducts biennial evaluations of all of the nuclear power plants in the United States. In the wake of the space shuttle *Columbia* tragedy and subsequent return to flight of *Discovery* he has been a featured guest and news analyst on NBC and National Public Radio.

Rick Hauck is married to Susan Camera Bruce. Together they have five children and six grandchildren.

**Wesley Huntress** is the Director of the Geophysical Laboratory at the Carnegie Institution of Washington where he conducts inter-disciplinary research in geobiology and astrochemistry. Prior to joining the Lab in 1998, he was Associate Administrator for Space Science at NASA Headquarters in Washington, DC, where he was responsible for NASA's robotic science missions to observe the universe and to explore the solar system. He developed many of the flight projects that are still operating today, including the Mars Exploration Program and the Cassini mission at Saturn, and is the originator of the Discovery program of low cost planetary missions. At the Carnegie Institution, he continues today as a spokesman and strategist for the scientific exploration of space. Dr. Huntress began his career at Caltech's Jet Propulsion Laboratory where his research group gained international recognition for its pioneering work in astrochemistry, the study of chemical evolution in space. He holds a B.S. in chemistry from Brown University (1964), a Ph.D. in chemical physics from Stanford University (1968) and an honorary Doctorate of Science from Brown (2005). He has published more than 100 papers in the scientific literature and has received many awards including NASA's Distinguished Service Medal, the US

Presidential Distinguished Executive Award, the Robert H. Goddard Award from NASA, the Carl Sagan Award from the American Astronautical Society, and a National Endowment for the Arts/Federal Design Achievement award for the Mars Pathfinder mission. Asteroid 7225 has been named after him. Dr. Huntress is President of The Planetary Society, an Academician in the International Academy of Astronautics, a Lifetime Associate of the National Academies, an Associate of the Royal Astronomical Society, and is a Distinguished Visiting Scientist at Caltech and JPL.

**Kay Coles James** was being nominated by President George W. Bush, and the United States Senate unanimously confirmed her to be Director of the U.S. Office of Personnel Management (OPM) on July 11, 2001. Former Director James is an advocate for Federal employees and leader of a dynamic agency with over 3,600 employees across the country, an annual budget in excess of 261 million dollars and trust funds that annually exceed 29 billion dollars in appropriations.

As President Bush's principal advisor in matters of personnel administration for the 1.8 million members of the Federal civil service, OPM, under Former Director James' leadership, manages financial programs and workforces that are larger than many Fortune 500 companies! In fact, if OPM were in the private-sector, it would rank as the largest Fortune 500 company in terms of assets.

Former Director James oversees the stewardship of over \$650 billion in Federal retirement, health, life and long term care insurance assets and oversees the Federal HSA program - the largest trust fund in the world.

Kay Coles James played an instrumental role in designing the process and system through which nearly 170,000 employees from 22 different agencies, each with different cultures and human resources services and represented by 17 separate labor unions, merged into the new Department of Homeland Security - one of the largest personnel mergers in history.

She was also a central official in supporting and implementing the legislation that led to human resource flexibilities at the Department of Defense - providing the President and Secretary of Defense greater flexibility to manage 700,000 Defense employees in the performance of their duties to support America's men and women in uniform.

OPM, under the leadership of Kay Coles James has streamlined the way Federal employees are hired by creating a website recording over 100 million visitors

since it was unveiled 19 months ago- and turning OPM into one of the largest recruiting agencies for thousands of retiring military veterans.

And OPM, under James, advises many nations on civil service and management issues - among those countries are Mexico, Taiwan, Japan, India, and Uganda.

James currently serves as the Chair of the Joint Financial Management Improvement Program (JFMIP) Principals. The JFMIP is a joint and cooperative undertaking of the U.S. Department of the Treasury, the General Accounting Office, the Office of Management and Budget, and the Office of Personnel Management working in cooperation with each other and other agencies to improve financial management practices in government.

Among OPM's responsibilities are planning for the future needs of the Federal workforce and for helping agencies improve human resources management and human capital practices and the protection of the Merit System Principles, ensuring Veterans' Preference, and monitoring workforce diversity in the Federal workforce. OPM is also responsible for the Federal Employee Health Benefits Program, Federal retirement benefits, Federal labor management relations, assisting agencies with recruiting and hiring employees, and developing managers and executives across Government to help agencies meet their strategic objectives.

OPM manages five Governmentwide e-Gov initiatives and oversees the Human Capital portion of the President's Management Agenda. The agency is also responsible for the creation of Flexible Spending Accounts for Federal employees, and the introduction of the new Federal Long-Term Care insurance program.

James is chair of the Chief Human Capital Officers Council (CHCO), a group comprised of the selected officers from cabinet departments and other agencies. Each CHCO is accountable for the strategic alignment of the agency's work force to its mission, and will be given the responsibility of maintaining and effectively directing its human resources management policies and programs. James is also a member of the President's Management Council and Chair of the Council's Subcommittee for Human Capital / Workforce Management. The Council has been charged by the President to ensure the implementation of his bold agenda of reform. James has also been appointed by the President to serve on the White House Fellows Commission.

Prior to coming to OPM James served as a leader and manager in Government on

the Federal, state, and local levels and in private, non-profit, and academic settings. She most recently served as a Senior Fellow and Director of The Citizenship Project at the Heritage Foundation. Prior to joining Heritage, James served as Dean of the School of Government at Regent University and as Chair of the National Gambling Impact Study Commission. James served as Secretary of Health and Human Resources for former Virginia Governor George Allen where she designed and implemented Virginia's landmark welfare reform initiative. As Secretary, James was responsible for fourteen state agencies and over 19,000 employees.

Before serving in the Allen Administration, James was Senior Vice President of the Family Research Council. She has also served as Executive Vice-President and Chief Operating Officer for One to One Partnership, a national umbrella organization for mentoring programs. She served under President George H. W. Bush as Associate Director of the White House Office of National Drug Control Policy and as Assistant Secretary for public affairs at the U.S. Department of Health and Human Services. She was appointed by President Reagan and reappointed by President George H. W. Bush as member of the National Commission on Children. James has served on the Fairfax County School Board and the Virginia Board of Education. She has also served on several corporate boards, including Focus on the Family and Amerigroup, Inc., a health care provider exclusively for low-income families.

A graduate of Hampton University, James is the recipient of numerous honorary degrees, most recently the Doctor of Laws Degree from Pepperdine University. Former Director James is also the recipient of several awards and special recognitions, including the University of Virginia's Publius Award for Public Service.

As a frequent commentator and lecturer, Mrs. James has appeared as a guest on every network morning show, several national news and talk programs, and her editorials have been featured in newspapers across the country. In addition, James is the author of three books; her award winning 1993 autobiography *Never Forget*; *Transforming America: From the Inside Out* (1995); and a third book on the subject of marriage (2001).

Most importantly, Kay Coles James is the wife of Charles James, Sr. and the proud mother of three grown children, and a new grandchild.

**Stephen Katz** was born in New York City in 1941 and grew up in the Washington, D.C., and Bethesda, Md., areas. He earned a B.A. degree cum laude

in history from the University of Maryland, College Park; an MD degree cum laude from Tulane University Medical School, New Orleans; and a Ph.D. degree in immunology from the University of London, England. He completed a medical internship at Los Angeles County Hospital, a residency in dermatology at the University of Miami School of Medicine, Florida, military service at Walter Reed General Hospital in Washington, DC, and postdoctoral work at the Royal College of Surgeons of England.

In 1974 he joined NIH as a senior investigator in the Dermatology Branch of NCI, becoming acting chief in 1977 and chief from 1980 - 2001. From 1989 to 1995, he also served a Marion B. Sulzberger professor of dermatology at the Uniformed Services University of the Health Sciences in Bethesda. On August 1, 1995, he was appointed director of NIAMS.

Dr. Katz' studies of Langerhans cells and epidermally derived cytokines have demonstrated that skin is a critical component of the immune system both in its normal function and as a target in immunologically mediated diseases. He has also made seminal discoveries in the field of inherited and acquired blistering skin diseases.

At NCI, he has led a program of investigations in fundamental biological and clinical problems in neoplastic and inflammatory diseases of the skin. He has trained a large number of immunodermatologists from the U.S. and abroad. These individuals are now leading their own independent research programs.

Dr. Katz has received many government and private sector honors and awards, including the Presidential Executive Meritorious Rank Award, PHS Superior Service Award, NIH Director's Award, Master Dermatologist Award and Sulzberger Lecture Award from the American Academy of Dermatology, Lifetime Achievement Award and D. Martin Carter Mentor Award from the American Skin Association, Outstanding Alumnus Award of Tulane University School of Medicine, Stephen Rothman Memorial Award of the Society for Investigative Dermatology (SID), Inflammatory Skin Disorders Research Award, Scleroderma Foundation's Messenger of Hope Award, honorary membership in many international dermatologic societies, and election into the NAS Institute of Medicine.

He has served many scientific organizations in leadership positions such as president of the Society for Investigative Dermatology, membership on the board of directors of SID and of the Association of Professors of Dermatology, secretary-general of the World Congress of Dermatology, and secretary-treasurer

of the Clinical Immunology Society. In addition, he was named president of the International League of Dermatological Societies in 1997, for a 5-year term.

Dr. Katz has also served on the editorial boards of most clinical and investigative dermatology journals and many immunology journals. He has authored or coauthored more than 180 scientific articles and 50 book chapters and edited several conference proceedings and books.

**Charles F. Kennel** was born in Cambridge, Massachusetts and spent his first 30 years on the east coast, where he was educated in astronomy and astrophysics at Harvard and Princeton. He joined the UCLA Department of Physics in 1967 and enjoyed a long and distinguished career in space plasma physics and rose eventually to the position of Executive Vice Chancellor of UCLA. In 1994 he was asked to serve as Associate Administrator at NASA and Director of Mission to Planet Earth, the world's largest Earth science program. His tenure at NASA convinced him of the importance of Earth system science and he decided to devote the rest of his professional efforts to matters of Earth and environment.

Kennel was appointed the ninth Director of Scripps Institution of Oceanography and Vice Chancellor of Marine Sciences at the University of California, San Diego, in 1998. A member of the National Academy of Sciences since 1991, he has served on many national and international boards and committees, including the Pew Oceans Commission, and he chaired the NASA Advisory Council. He has also received numerous distinguished prizes and awards.

At the request of UCSD Chancellor Marye Anne Fox in June 2005, Dr. Kennel is leading the effort to develop a campus-wide environmental sustainability initiative for UCSD, embracing teaching, research, campus operations, and public outreach. He plans to step down as Director of Scripps in September 2006 and assume a faculty position at Scripps working on sustainability science.

**Gerald L. Kulcinski** has been the Associate Dean for Research for the College of Engineering at the University of Wisconsin-Madison since 2001. Dr. Kulcinski is also the Grainger Professor of Nuclear Engineering and the Director of the Fusion Technology Institute. He was elected to the National Academy of Engineering in 1993 and was awarded the NASA Public Service Medal in 1993. He has been a Fellow in the American Nuclear Society since 1978.

Professor Kulcinski worked on the Nuclear Rocket Program at Los Alamos in 1963 and conducted and directed research on the effects of radiation in metals

while serving as a senior research scientist at the Battelle Northwest Laboratories from 1965 to 1971. From 1965 to 1971 he was a Lecturer at the Center for Graduate Study in Richland, Washington. Dr. Kulcinski joined the Nuclear Engineering Department at the University of Wisconsin in 1972. He was a visiting scientist at the Karlsruhe Nuclear Research Center in West Germany in 1977 and was on sabbatical leave at the Bechtel Corporation in San Francisco in 1989 and 1995.

He has been a member of the American Nuclear Society since 1961, Technical Program Chair of the 2nd ANS Topical Meeting on Fusion Technology (1976), served on the ANS Board of Directors (1987-90), and was the General Chairman of the 16<sup>th</sup> ANS Topical meeting on Fusion Technology in 2004. In 1978, he received the Curtis W. McGraw Research Award by the Engineering Research Committee of the American Association of Engineering Education. In 1980, he received the Outstanding Achievement Award from the Controlled Thermonuclear Division of the American Nuclear Society. He was a U.S. delegate to the International Tokamak Reactor (INTOR) Project in Vienna, Austria from 1979 to 1981. In 1984, he was appointed to the Grainger Chair of Nuclear Engineering at the University. He received the John Randle Grumman Achievement Award from the Grumman Aircraft Corporation in 1987. He was awarded the 1992 Leadership Award in Fusion by Fusion Power Associates. In 1993, he was elected to Phi Kappa Phi. In 1994, he was awarded the Distinguished Faculty Award by the Wisconsin Alumni Foundation and in 1995 he received the Wisconsin Big 10 Centennial Award. He was an Associate Editor of Fusion Engineering and Design from 1983-2003. Dr. Kulcinski has served on several review panels for the National Academy of Sciences, the Department of Energy, Los Alamos National Laboratory, Sandia National Laboratory, and Argonne National Laboratory in the United States as well as for the Karlsruhe Nuclear Laboratory in Germany and the Ontario Hydroelectric Utility in Canada. He was a member of the National Research Council Board on Energy and Environmental Systems from 2000 to 2005.

Dr. Kulcinski received his B.S. Chemical Engineering degree in 1961 and his Ph.D. in Nuclear Engineering from the University of Wisconsin in 1965. His current research interests lie with In-Situ Resource Utilization on the Moon and the development of clean, safe, and economical energy sources from space. He has published over 210 peer reviewed scientific articles, over 270 additional reports and articles in conference proceedings, and is a co-author or contributor to four books.

**Eugene Levy** was appointed to the Howard R. Hughes Chair as Provost and Professor of Physics and Astronomy at Rice University in July 2000. As Provost, Professor Levy is the chief academic officer of the university and has overall responsibility for educational and research programs. The university's deans report to the Provost, as do other university units directly responsible for supporting academic and research programs. In addition, the Provost oversees many interdepartmental initiatives and institutes, is a liaison with government and industry regarding academic and research programs and their funding.

Professor Levy received a Ph.D. in Physics from the University of Chicago (1971) and an A.B. in Physics from Rutgers University (1966). Before assuming his current position at Rice University, Professor Levy held appointments as Professor of Planetary Sciences and Professor of Physics at the University of Arizona. From 1983 to 1994, he was the Head of the Planetary Sciences Department and Director of the Lunar and Planetary Laboratory. From 1993 to 2000, he served as Dean of the College of Science. Professor Levy also was a member of the faculties of Arizona programs in Applied Mathematics and Theoretical Astrophysics. In 1989, he established the NASA/Arizona Space Grant College Consortium and served as its director for eleven years.

In 1983 Professor Levy was awarded the NASA Distinguished Public Service Medal, and from 1985 to 1991 he held appointment as Distinguished Visiting Scientist at the Jet Propulsion Laboratory of the University of California Institute of Technology. In Germany in 1989, Professor Levy was presented with an Alexander von Humboldt-Stiftung Senior Scientist Award. At the University of Arizona, Professor Levy received a Martin Luther King, Jr. Distinguished Leadership Award in 1996, and in 1999 he was the inaugural recipient of the Hispanic Alumni Association Outstanding Administrator Award. Professor Levy is a fellow of the American Association for the Advancement of Science. He was elected to Phi Beta Kappa and Sigma Xi at Rutgers.

Professor Levy has served on numerous scientific policy and program advisory committees and boards at the national and international levels throughout his career. Currently, he is a member of the Board of Trustees of the Associated Universities, Inc. (AUI) (2001-2004) as well as the Space Telescope Institute Council. He has served on the NASA Planetary Protection Advisory Committee since 2002; he currently chairs the committee and is a member of the NASA Advisory Council.

Professor Levy's research interests have focused in several areas of theoretical

cosmic physics, aimed at elucidating mechanisms and processes that underlie physical phenomena in planetary and astrophysical systems. His work has encompassed areas of planetary geophysics, magnetohydrodynamics, solar and space physics, and electrodynamics. He has investigated the generation and behavior of magnetic fields in natural bodies, including the Earth, Sun, and the planets; origin of the geomagnetic reversal; theory of cosmic rays; theory of physical processes associated with the formation of the solar system, stars, and other planetary systems. He has also worked on the development of observational techniques for the discovery and study of other planetary systems.

**John M. Logsdon** is Director of the Space Policy Institute at George Washington University's Elliott School of International Affairs, where he is also Professor of International Affairs. From 1983-2001, he was also Director of the School's Center for International Science and Technology Policy. He has been a faculty member at GW since 1970; from 1966-1970 he taught at the Catholic University of America. He holds a B.S. in Physics from Xavier University (1960) and a Ph.D. in Political Science from New York University (1970). Dr. Logsdon's research interests focus on the policy and historical aspects of U.S. and international space activities.

Dr. Logsdon is the author of *The Decision to Go to the Moon: Project Apollo and the National Interest* and is general editor of the eight-volume series *Exploring the Unknown: Selected Documents in the History of the U.S. Civil Space Program*. He has written numerous articles and reports on space policy and history, and has recently completed the basic article on "space exploration" for the new edition of Encyclopedia Britannica. Dr. Logsdon has lectured and spoken to a wide variety of audiences at professional meetings, colleges and universities, international conferences, and other settings, and has testified before Congress on several occasions. He has served as a consultant to many public and private organizations. He is frequently consulted by the electronic and print media for his views on space issues.

Dr. Logsdon in 2003 served as a member of the Columbia Accident Investigation Board. He is a member of the NASA Advisory Council and the Commercial Space Transportation Advisory Committee of the Department of Transportation. He is a recipient of the Distinguished Public Service and Public Service Medals from NASA and the 2005 John F. Kennedy Astronautics Award from the American Astronautical Society. He is a Fellow of the American Institute of Aeronautics and Astronautics and the American Association for the Advancement of Science, and a member of the International Academy of

Astronautics and Chair of its Commission on Space Policy, Law, and Economics. He is member of the Board of Directors of the Planetary Society and former chair of the Society's Advisory Council. He is faculty member of the International Space University and former member of its Board of Trustees. He is on the editorial board of the international journal *Space Policy* and was its North American editor from 1985-2000. He is also on the editorial board of the journal *Astropolitics*.

Dr. Logsdon has served as a member of a blue-ribbon international committee evaluating Japan's National Space Development Agency and of the Committee on Human Space Exploration of the Space Studies Board, National Research Council. He has also served on the Vice President's Space Policy Advisory Board, the Aeronautics and Space Engineering Board of the National Research Council, NASA's Space and Earth Sciences Advisory Committee, and the Research Advisory Committee of the National Air and Space Museum. He has served as the Director of the District of Columbia Space Grant Consortium. He is former Chairman of the Committee on Science and Public Policy of the American Association for the Advancement of Science and of the Education Committee of the International Astronautical Federation. He has twice been a Fellow at the Woodrow Wilson International Center for Scholars and was the first holder of the Chair in Space History of the National Air and Space Museum.

**David E. Longnecker, M.D.** is a Director at the Association of American Medical Colleges (AAMC), the organization of U.S. medical schools and teaching hospitals, and the Robert D. Dripps Professor Emeritus of Anesthesiology and Critical Care at the University of Pennsylvania. At the AAMC, he is leading the development of a national organization for Chief Medical Officers, the physicians who are responsible for coordinating clinical care, clinical service and patient safety in academic medical centers.

Dr. Longnecker received his undergraduate and medical education at Indiana University. He has spent his professional career as a physician-scientist, physician-educator and physician-administrator, first at the University of Missouri, subsequently at the University of Virginia and recently at the University of Pennsylvania, where he served as Chair of the Department of Anesthesiology, Vice Dean for Professional Services and Senior Vice President-Corporate Chief Medical Officer of the University of Pennsylvania Health System. Dr. Longnecker is the author of numerous scientific articles and chapters and the editor of six medical textbooks. Currently he is editing his seventh text, a two-volume, 2500 page textbook of anesthesiology that will be

published in 2006.

Dr. Longnecker has served as President of the American Board of Anesthesiology, President of the National Resident Matching Program, President of the Association of University Anesthesiologists, and founding President (by election) of the W.T.G. Morton Society. He is a member of the Harvard-Kennedy School of Government Health Care Delivery Design Project that is exploring innovative approaches to quality, cost and productivity in health care. He is a fellow (by election) of the Royal College of Anaesthetists (UK) and member of the Institute of Medicine (IOM) of the National Academy of Sciences. At the IOM, Dr. Longnecker is Chair of the Committee on Aerospace Medicine and Medicine for Extreme Environments, which advises NASA on medical risks, medical care and health-related matters associated with space flight. He is the senior author on two recent reports from the IOM; A Review of NASA's Longitudinal Study of Astronaut Health (2004) and A Review of NASA's Bioastronautics Roadmap: A Risk Reduction Strategy for Human Exploration of Space (2005).

**Lester L. Lyles** is the former Commander of the Air Force Materiel Command, headquartered at Wright-Patterson AFB , Ohio. The Command was responsible for all Research and Development, Science and Technology, Test, and Logistics Support for the U.S. Air Force.

He has commanded The Ogden Air Logistics Center at Hill AFB, Utah; and, the Air Force Space and Missile Development Center in Los Angeles. He was also the Director of the Ballistic Missile Defense Office under the Office of the Secretary of Defense. General Lyles served as the 27th Vice Chief of Staff of the Air Force. He retired from the Air Force in 2003 after 35 years of service.

His numerous awards include the Defense Distinguished Service Medal ; the Astronautics Engineer of the Year from the National Space Club ; the National Black Engineer of the Year Award ; Honorary Doctor of Laws from New Mexico State University ; and NASA's Distinguished Public Service Medal for serving on the 'President's Commission on Implementing the U.S. Space Exploration Policy'.

General Lyles received a Bachelor of Science degree in Mechanical Engineering from Howard University in Washington, D.C., and a Masters degree in Mechanical Engineering from New Mexico State University [under the auspices of the Air Force Institute of Technology].

General Lyles is a native of Washington, D.C.

**Wendell Maddox** is President and CEO of ION Corporation. Starting with no more than a dream in 1985, Mr. Maddox turned ION Corporation in 3 years into an engineering company with annual revenues of \$13 million. ION Corporation has been recognized as a United States leader in the fabrication of spaceflight and aerospace hardware. Mr. Maddox's vision has lead ION to expand its products and services from manufacturing, to design, engineering, and systems integration. In 2005, ION was presented NASA's Special Recognition Award for its performance on NASA's Deep Space Network Advanced Systems Program. Since 1995

Mr. Maddox founded the Midwest Aerospace Consortium of Small Business, which has a membership to more than 300 small businesses located throughout 6 Midwestern states. Its Charter is to bring Midwest technology to the aerospace industry and the United States of America. Mr. Maddox also served as a director on the Board of the American's for a Sustainable Economy. He served as Chairman to the White House Conference on Small Business from the State of Minnesota and has personally met with a number of Presidents including Ronald Reagan, George Bush Sr., Bill Clinton, and George W. Bush. Wendell has a deep sense of community responsibility serving on the MN State Board of Education, the Hopkins Rotary, and the Twin Cities Chamber of Commerce and chairing the Hopkins United Way campaign. He served as Director for Minnesota Project Outreach, Minnesota Youth at Risk.

After completing his service in the US Air Force, and acquiring his BSEE degree from the University of Minnesota, Mr. Maddox joined FMC Corporation. During his 20 year career, he held a variety of management positions and was the General Manager of Manufacturing, when he left to found ION. He currently resides with his wife Julia and youngest son Julian in Minnetonka, a suburb of Minneapolis, MN.

**Edward R. McPherson** was appointed the under secretary of education in April 2004 by President Bush and subsequently confirmed by the United States Senate. He is a member of the President's Management Council.

As the under secretary of education, McPherson serves as Chief Operating Officer of the Department, overseeing the effective investment and management of the Department's grants, loans, contracts and related services. The Department of Education invests an annual budget in excess of \$66 billion to promote excellence in education throughout America and manages student loans, grants

and guarantees of approximately \$400 billion.

He contributes valuable results in the use of resources by states and localities on behalf of America's children and taxpayers. McPherson also enhances the Department's operating effectiveness in information technology, human capital and management processes.

McPherson had been serving since Oct. 5, 2001, as chief financial officer of the U.S. Department of Agriculture (USDA), following his appointment by President Bush and confirmation by the U.S. Senate. At the Department of Agriculture he was responsible for the financial leadership of an enterprise that, were it in the private sector, would be one of the largest companies in the United States with more than 100,000 employees, \$123 billion in assets and \$70 billion in annual spending. The Department of Agriculture provides \$100 billion in direct loans, \$29 billion in credit guarantees and \$38 billion in reinsurance to support America's farmers and ranchers, promote global trade, protect America's food and water, and conduct massive humanitarian nutrition programs.

Just over a year after McPherson took office, the Department of Agriculture and all its agencies for the first time ever received a "clean" audit opinion from its Office of the Inspector General for fiscal year 2002. This achievement required massive changes in accountability and internal control and was recognized by the Secretary of Agriculture through an Honor Award. USDA sustained this improved accountability by also receiving clean audits in FY 2003 and FY 2004. McPherson was also responsible for the National Finance Center in New Orleans, La., which administers the world's largest retirement plan, with \$100 billion in investments for three million federal civilian and military personnel, and processes \$26 billion annually in payroll for more than 500,000 governmental employees.

Prior to being appointed by President Bush, McPherson was president of InterSolve Group, which he founded in 1989. The business of InterSolve Group is executing the commercial agenda of chief executive officers by leading high-performance project teams of JUST-IN-TIME-TALENT™. InterSolve Group is widely recognized as America's first virtual service company that takes responsibility to produce valuable results by leading the best available talent so as to execute "on demand" for Fortune 100 companies and Forbes 400 entrepreneurs.

McPherson has been called a pioneer by Tom Peters, who featured him in his seminars, his book *Crazy Times Call for Crazy Organizations* and his newsletter

*On Achieving Excellence.* In addition, Business Week's cover story on the "Virtual Corporation" in 1993 highlighted McPherson for earning \$14 million in 90 days for a client by leading project teams from four different companies totaling 26 people, only one of whom he had met before, in restructuring business processes, applying information technology and managing the human side of change.

McPherson received special recognition in 2000 and 1999 for his personal contributions to advancing domestic outsourcing as a means of helping companies improve performance, profitability and shareholder value. He was nominated in 2000 for an Entrepreneur of the Year Award in Ernst & Young's Southwestern region.

With over 30 years of experience in leadership, organizational enhancement, business strategy and corporate finance, McPherson has served as chief financial officer of two large holding companies, including SunAmerica, which now has over \$100 billion of mutual funds, annuities, and investment services in Los Angeles as part of American International Group. Earlier, at age 37, he was chief financial officer of First Republic Bank Corporation in Dallas, which had peaks of \$140 million in earnings, \$35 billion in assets and more than 17,000 people prior to its acquisition by Bank of America.

He has participated in 25 business acquisitions, issued debt and equity in the domestic and international capital markets, and served as a director of a venture capital fund. McPherson has received an award for excellence from the Financial Analysts Federation in New York City, gained recognition as a management consultant with Booz Allen Hamilton, and was awarded the Joint Service Commendation Medal as an officer in the U.S. Navy with the Defense Intelligence Agency.

He graduated from Williams College, has a master's degree from the George Washington University, and attended the corporate financial management executive program at Harvard University Graduate School of Business Administration.

McPherson has served as a trustee of the Hockaday School—one of the largest private secondary school for girls in the United States—and has addressed numerous business and leadership groups. His insights into the new economy have appeared in *Fast Company* and Reuters.

Raised in Gettysburg, Pa., and a resident of Dallas, Texas, McPherson and his

wife Sally have two children: Beth, a teacher in Austin, Texas, and Edward, a writer in New York City. McPherson is an advocate for excellence in academics and amateur athletics, enjoys playing in alumni basketball games, and has completed a marathon race.

**R. James Milgram**, professor of mathematics at Stanford University, received his B.S. and M.S. from the University of Chicago, and his Ph.D. from the University of Minnesota. He has given lectures around the world and is a member of numerous boards and committees, including the National Board of Education Sciences, a body created by the Education Sciences Reform Act of 2002 “to advise and consult with the Director of the Institute of Education Sciences (IES) on agency policies.”

Dr. Milgram is the author of *"An Evaluation of CMP," "A Preliminary Analysis of SAT-I Mathematics Data for IMP Schools in California,"* and *"Outcomes Analysis for Core Plus Students at Andover High School: One Year Later."* This latter paper is based on a statistical survey undertaken by Gregory Bachelis, professor of mathematics at Wayne State University. Each of these papers identifies serious shortcomings in the mathematics programs: CMP, Core-Plus, and IMP.

**Michael Montelongo** is Senior Vice President, Strategic Marketing for Sodexho, Inc. and a member of Sodexho’s executive committee where he is based in Gaithersburg, Maryland.

Mr. Montelongo has extensive senior management experience in the national security community, including service in the Senate and the Pentagon, and the telecommunications and consulting industries. Throughout his career he has been involved in strategy and policymaking for major, multinational commercial and public sector enterprises and is recognized for leading change in large organizations.

At Sodexho Inc., a \$6 billion, 110,000-person enterprise, Mr. Montelongo is the chief strategist leading the company’s North American strategic planning and development including its mid-term planning process. This process includes market research, client segmentation and sub-segmentation activities, and strategy development.

Previously, Mr. Montelongo was appointed by President Bush as assistant secretary of the Air Force where he served as its chief financial officer

responsible for a budget of over \$120B and financing two major combat operations; he concluded his tenure at the Pentagon as acting secretary of the Air Force.

Before joining the Bush administration, he was a sales executive and consultant with Cap Gemini Ernst and Young and earlier served as director for sales and service support with BellSouth Telecommunications. Additionally, Mr. Montelongo completed a career in the U.S. Army serving as a congressional fellow in the U.S. Senate, Special Assistant and Speechwriter to the Army Chief of Staff, Special Assistant to the Commander-in-Chief of U.S. Southern Command, and as assistant professor teaching economics and political science at the U.S. Military Academy at West Point.

Active in several civic pursuits, he served a term as National President for the American Society of Military Comptrollers and is a member of the Council on Foreign Relations. Mr. Montelongo also serves on the board of directors for Denny's Corporation and the National Aeronautics and Space Administration (NASA) Advisory Council.

Mr. Montelongo earned his bachelor's degree in science from the U.S. Military Academy and a master's degree in business administration from Harvard Business School. He is listed in Hispanic Business Magazine's *100 Most Influential Hispanics* and in Hispanic Engineer Magazine's *50 Most Important Hispanics in Technology and Business*.

**Mark Robinson** is Professor of Earth and Planetary Sciences and Director of the Center for Planetary Sciences at Northwestern University. His research interests are currently focused on the origin and evolution of planetary crusts, including volcanism, tectonism, and regolith development. Investigations are approached using a variety of remote sensing techniques: multispectral imaging, spectroscopy, stereo analysis, and geomorphology utilizing datasets from Apollo, Lunar Orbiter, Clementine, Galileo, NEAR, Lunar Prospector, Mars Global Surveyor, and Mars Odyssey.

As a member of the MESSENGER Science Team he will work to constrain the chronology of volcanism and tectonism on Mercury using the rich datasets to be returned upon the spacecraft's arrival at this enigmatic planet. As PI of the Lunar Reconnaissance Orbiter Camera (LROC) Robinson will lead science analysis of ultra-high resolution (50 cm/pixel) imaging and the first ever global high resolution UV through Visible multispectral mapping (315 nm to 680 nm) of the

Moon. The LROC imaging systems provide opportunities to map compositional variations of the lunar crust and reveal details of how airless body regoliths (soils) are formed and evolve with time — key knowledge for planning and executing future lunar exploration endeavors. Robinson is also a member of the Mars Reconnaissance Orbiter CRISM imaging spectrometer team working to find the spectral fingerprints of aqueous and hydrothermal deposits to help unravel the history of water on Mars.

**Howard J. Stanislawski** is a partner in the Washington, D.C., office of the law firm of Sidley Austin Brown & Wood. He has worked extensively with both international and domestic clients in counseling and litigation involving aerospace and defense issues, export controls, foreign military sales and many aspects of Government contracting. In his representation of clients, he has worked extensively with agencies of the United States Department of Defense, Department of Commerce, Department of Education, Department of Energy, Department of State, Federal Bureau of Investigation, Environmental Protection Agency, United States Agency for International Development, Department of Justice, Department of Transportation and Department of Health and Human Services. Mr. Stanislawski has represented clients in litigation before the United States Court of Appeals for the Federal Circuit, United States Court of Federal Claims, United States District Courts and state courts in a variety of states, Armed Services Board of Contract Appeals, General Services Board of Contract Appeals, and Government Accountability Office. He is currently the chair of the American Bar Association's Section of International Law's Aerospace and Defense Industries Committee.

Mr. Stanislawski holds a J.D., magna cum laude, from Boston College Law School (1986, Order of the Coif), a Ph.D. in Politics from Brandeis University (1981), an M.A. in Near Eastern Studies (1975) and an M.A. in Politics (1972), also from Brandeis University, and a B.A., First Class Honors in Economics and Political Science, from McGill University (1970). He was admitted to the Massachusetts Bar in 1986 and the DC Bar in 1987, and is currently a member of the DC Bar.

Mr. Stanislawski advises clients on a wide array of statutory and regulatory requirements applicable to the aerospace and defense industries, such as protectionist provisions like the Buy American Act, the export control regimes of the Departments of State and Commerce, and the requirements of the Missile Control Technology Regime. He has particular expertise in the area of American anti-boycott provisions and their enforcement by the Department of Commerce,

and, since the mid-1970s, he has followed closely the development and implementation of anti-boycott provisions in American law. Mr. Stanislawski's doctoral dissertation focused on anti-boycott statutes, regulations and policies implemented in the United States, United Kingdom, France, the Netherlands and Canada. Mr. Stanislawski also advises clients on the legal regimes applicable to foreign ownership, control and influence over American companies performing classified work for the Departments of Energy and Defense. He works closely with clients in all areas of due diligence involving Government contracts and advises clients on acquisitions and divestitures of Government contracting businesses.

Mr. Stanislawski has been at the forefront of Sidley's focus on Government contract cost accounting issues, including matters involving interpretation and implementation of the Federal Acquisition Regulation's cost principles and the Cost Accounting Standards. He has expertise in the highly complex area of accounting for pension costs in Government contracts, and has been involved in counseling clients and litigating disputes involving interpretations of the cost principles, including those relating to depreciation and asset step-up resulting from business combinations. He has worked closely with clients in the development of complex claims relating to federal Government contracts and in their development and implementation of cost accounting systems and negotiation of contracts with the federal government. He has also conducted internal investigations at the request of clients and has represented clients in their responses to investigations conducted by the Department of Justice, Inspectors General of various agencies, and investigatory bodies of the Department of Defense and other federal agencies. He regularly advises clients on multiple aspects of U.S. Government contracts that are performed abroad, and advises foreign clients on many aspects of their performance of contracts for the U.S. Government, both abroad and in the United States.

Prior to his work as an attorney, Mr. Stanislawski taught Political Science at Wellesley College, Brandeis University and Boston College.

**Neil deGrasse Tyson** was born and raised in New York City where he was educated in the public schools clear through his graduation from the Bronx High School of Science. Tyson went on to earn his BA in Physics from Harvard and his PhD in Astrophysics from Columbia.

Tyson's professional research interests include star formation, exploding stars, dwarf galaxies, and the structure of our Milky Way. Tyson obtains his data from

the Hubble Space Telescope, as well as from telescopes in California, New Mexico, Arizona, and in the Andes Mountains of Chile.

In 2001, Tyson was appointed by President Bush to serve on a 12- member commission that studied the Future of the US Aerospace Industry. The final report was published in 2002 and contained recommendations (for Congress and for the major agencies of the government) that would promote a thriving future of transportation, space exploration, and national security.

In 2004, Tyson was once again appointed by President Bush to serve on a 9-member commission on the Implementation of the United States Space Exploration Policy, dubbed the "Moon, Mars, and Beyond" commission. This group navigated a path by which the new space vision can become a successful part of the American agenda.

In addition to dozens of professional publications, Dr. Tyson has written, and continues to write for the public. He is a monthly essayist for Natural History magazine under the title "Universe." And among Tyson's seven books is his memoir *The Sky is Not the Limit:*

*Adventures of an Urban Astrophysicist;* and *Origins: Fourteen Billion Years of Cosmic Evolution*, co-written with Donald Goldsmith. *Origins* is the companion book to the PBS-NOVA 4-part mini-series *Origins* in which Tyson serves as on-camera host. The program premiered on September 28 and 29, 2004.

Tyson is the recipient of seven honorary doctorates and the NASA Distinguished Public Service Medal. His contributions to the public appreciation of the cosmos have been recognized by the International Astronomical Union in their official naming of asteroid "13123 Tyson". On the lighter side, Tyson was voted "Sexiest Astrophysicist Alive" by *People Magazine* in 2000.

Tyson is the first occupant of the Frederick P. Rose Directorship of the Hayden Planetarium where he also teaches. Tyson lives in New York City with his wife and two children.

**Christopher Blackerby** is the Executive Director of the NASA Advisory Council. Most recently he worked as an International Programs Specialist in NASA's Office of External Relations, Exploration Systems and Aeronautics Research Division. In this capacity, he supported and advised the Exploration Systems Mission Directorate on issues related to cooperation with international partners. Mr. Blackerby first entered federal government service in October 2002

as a Presidential Management Fellow. After working for 1 year in the External Programs and Research and Technology Directorates at NASA Glenn Research Center, Mr. Blackerby transferred to NASA Headquarters, where he has supported the Science and Exploration Systems Mission Directorates.

Mr. Blackerby has a Masters degree in Political Science/International Relations from the University of Rhode Island, and a B.A. in History and Education from the University of Richmond (VA). Prior to enrolling in graduate school, he was a high school teacher in Seattle, Washington for 2 years, and subsequently lived in Nara, Japan, where he worked as an English teacher and conducted graduate school research for a total of two years.

**NASA ADVISORY COUNCIL**  
**House & Senate Office Buildings, Washington, DC**  
**November 29-30, 2005**

**MEETING ATTENDEES**

*Council Members:*

Schmitt, Harrison, <i>Chair</i>	Aerospace Consultant
Abrahamson, James	US Air Force (Ret.), Aerospace Consultant
Alonso, Juan	Stanford University
Armstrong, Neil	Apollo 11 Astronaut
Blackerby, Christopher, <i>Executive Director</i>	NASA Headquarters
Colladay, Raymond, <i>Ex-Officio</i>	Aeronautics and Space Engineering Board
Fisk, Lennard, <i>Ex-Officio</i>	Space Studies Board
Hanisee, Robert	Trust Company of the West
Hauck, Frederick (Rick)	US Navy (Ret.)
Huntress, Wesley	Carnegie Institute of Washington
James, Kay Cole	Consultant
Katz, Stephen	NIAMSD, National Institutes of Health
Kulcinski, Gerald	University of Wisconsin-Madison
Levy, Eugene	Rice University
Logsdon, John	George Washington University
Longnecker, David, <i>Ex-Officio</i>	Institute of Medicine
Lyles, Lester	US Air Force (Ret.), Consultant
Maddox, Wendell	ION Corporation
McPherson, Edward (Ted)	US Department of Education
Milgram, R. James	Stanford University
Montelongo, Michael	Sodexo, Inc.
Stanislowski, Howard	Sidley Austin Brown & Wood
Tyson, Neil	Hayden Planetarium

*NASA Attendees:*

Allen, Marc	NASA Headquarters
Barrie, Terry	NASA Headquarters
Beasley, Dolores	NASA Headquarters
Bianco, Jean	NASA Headquarters
Borvis, Terry	NASA Headquarters
Braukus, Michael	NASA Headquarters
Cleave, Mary	NASA Headquarters
Cordwell, Kevin	NASA Headquarters
Cucarola, Pamela	NASA Headquarters
Dakon, Kathy	NASA Headquarters
Dawsey, Toni	NASA Headquarters
Diaz, Angela Philips	NASA Headquarters
Falcon, Andrew	NASA Headquarters
Gerstenmaier, William	NASA Headquarters
Geuthner, Paul	NASA Headquarters
Green, Thomas	NASA Headquarters
Griffin, Mike	NASA Headquarters
Harrington, J.D.	NASA Headquarters
Hertz, Paul	NASA Headquarters
Horowitz, Scott	NASA Headquarters
Howard, Rick	NASA Headquarters
Jani, G.	NASA Headquarters
Kellum-Cloman, Kamann	NASA Headquarters
King, Marla	NASA Headquarters
Kovalchik, Bob	NASA Headquarters
Krezel, Jon	NASA Headquarters
Luther, Mike	NASA Headquarters
Maizel, Roy	NASA Headquarters
Marinero, John	NASA Headquarters
Mathews, Melissa	NASA Headquarters
McGinley, Stephen	NASA Headquarters
Medus, Kathy	NASA Headquarters
Moore, Michael	NASA Headquarters
Mould, David	NASA Headquarters
O'Brien, Carley	NASA Headquarters
Ostrach, Louis	NASA Headquarters
Parham, Jane	NASA Headquarters

Porter, Lisa	NASA Headquarters
Rahn, Debbie	NASA Headquarters
Ralsky, Michael	NASA Headquarters
Rausch, Diane	NASA Headquarters
Rummel, John	NASA Headquarters
Schingler, Robert	NASA Headquarters
Smith, Eric	NASA Headquarters
Spencer, Larry	NASA Headquarters
Stehmer, Karl	NASA Headquarters
Sykes, Gwen	NASA Headquarters
Thomas, Ralph	NASA Headquarters
Varsi, Giulio	NASA Headquarters
Walker, Kevin	NASA Headquarters
Wholley, Mike	NASA Headquarters
Williams, Greg	NASA Headquarters
Wipensky, Jennifer	NASA Headquarters

*Other Attendees:*

Bannan, Kate	University of California
Bardos, Russ	Spacehab
Beckman, Bill	Boeing
Billings, Linda	SETI Institute
Boyd, Robert	Knight Ridder
Bronwer, Randy	Cong. Rohrabacker
Brown, Doug	[not affiliated]
Bruno, Mary	Ball
Clark, Conn	Space News
Connors, Deborah	GSA
Cowing, Keith	NASA Watch
Dador, Daphne	Space Subcommittee
Damphousse, Paul	USMC/DARPA
Dinerman, Taylor	WSJ
Eckardt, Derrick	Boeing
Feddeman, Ed	House Science
Ferguson, Shawn	Sen. Kent Conrad
Fisher, Mischa	Rep. Jim Ramstad
Flaak, A. Robert	GSA
Freer, Harrison	Northrop Grumman

Garretson, Peter	USAF
Geller, P.S.	Wroer
Gibbs, Graham	CSA
Glinn, Bridget	Lewis-Borke Assoc.
Higgins, Jordan	US Congress
Karanian, Linda	LMC
Kim, Sophia	NGC
Koch, Robbie	CHCG
Ladwig, Alan	Northrup Grumman
Lang, John	Aerospace
Lawler, Andrew	Science Magazine
Livio, Mario	Space Telescope Science Institute
Loschnigg, Johannes	House Science Committee
Malay, Jon	Lockheed Martin
Morring, Frank	Aviation Week
Morris, Jeff	Aerospace Daily
Nordlund, Frederic	ESA
Obermann, Richard	US Congress
Ono, Ayako	foreign student (Space Art)
Peterson, Chris	SRI
Peura, Angela	GWU SPI
Reichhardt, Tony	National Air & Space
Roberts, Roselee	Science Committee
Ryen, Tind	House Science Committee
Schaffer, Audrey	GWU SPI
Scott, Amy	AAU
Shea, Karen	Lunar Development
Shibukawa, Kiwao	JAXA
Smith, Dave	Sen. Conrad Burns
Smith, Marcia	CRS
Smith, Mike	Senate staff
Smith, W. S.	AURA
Springs, Tony	NGC
Stasny, Jim	FAA
Stewart, Mike	ITT Industries
Treat, David	GWU SPI
Tsuruma, Hitoshi	JAXA
Vann, Tim	Sen. Trent Lott
Wemies, Maria	SAIC

**NASA ADVISORY COUNCIL  
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November 29-30, 2005**

**LIST OF PRESENTATION MATERIAL<sup>1</sup>**

- 1) Federal Advisory Committee Act [Rausch]
- 2) Ethics Briefing for Special Government Employees Serving on NASA Advisory Committees [Falcon]
- 3) Exploration Systems Overview [Horowitz]
- 4) Space Shuttle and International Space Station Programs Overview [Gerstenmaier]
- 5) Audit and Finance Overview [Sykes]
- 6) NASA Science Overview [Cleave]
- 7) Reshaping the NASA Workforce [Dawsey]
- 8) NASA's Small Business Program [Thomas]
- 9) NASA Office of Education [Diaz]
- 10) Reshaping NASA's Aeronautics Program [Porter]

Other material distributed to the Council:

- 1) GAO Testimony: National Aeronautics and Space Administration – Long-standing Financial Management Challenges Threaten the Agency's Ability to Manage Its Programs, October 27, 2005
- 2) Charter of the NASA Advisory Council
- 3) Editorial by Donald Kennedy: "NASA – Back to Eating Seed Corn"
- 4) Administrator Michael Griffin's Remarks at the Center for Strategic & International Studies Workshop on Space Exploration and International Cooperation, November 1, 2005
- 5) "NASA and the Business of Space", Administrator Michael Griffin's Remarks at the 52<sup>nd</sup> Annual Conference of the American Astronautical Society, November 15, 2005
- 6) The Role of Small Businesses in NASA's Return to Flight Initiative
- 7) Women Contractors at NASA – Selected Profiles of Women-Owned Small Businesses Contributing to America's Space Program

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<sup>1</sup> Presentation Material is on file at NASA Headquarters, OER/ACMD, 300 E Street SW, Washington, DC 20546.