

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

NASA ADVISORY COUNCIL

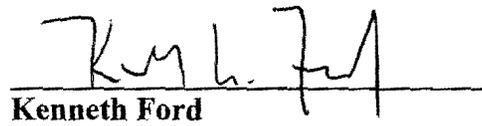
October 29, 2009

**Ames Research Center
NASA Research Park Conference Center
Mountain View, CA**

MEETING MINUTES



**P. Diane Rausch
Executive Director**



**Kenneth Ford
Chair**

**NASA ADVISORY COUNCIL
Ames Research Center
NASA Research Park Conference Center
October 29, 2009**

**Meeting Report
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*Meeting Report Prepared By:
Paula Burnett Frankel*

**NASA ADVISORY COUNCIL
NASA Research Park
NASA Ames Research Center
Mountain View, CA
October 29, 2009**

Announcements and Opening Remarks

Ms. Diane Rausch, Executive Director of the Council, called the meeting to order, welcomed the NASA Advisory Council (NAC) members and attendees, and made a few brief announcements. She reminded everyone that the meeting was open to public and held in accordance with the Federal Advisory Committee Act (FACA) requirements. All comments will be on the record. The meeting minutes will be taken by Ms. Paula Frankel, and will be posted to the web site: www.nasa.gov/offices/nac/, shortly after the meeting. All of the NAC members are serving as experts in their fields and as Special Government Employees. They are subject to the ethics regulations, and will recuse themselves from discussions on any topic in which there could be a potential conflict of interest. Ms. Rausch invited the public attendees to take a copy of the roster of members and the agenda.

Dr. Simon P. "Pete" Worden, Director of NASA Ames Research Center (ARC), welcomed the members of the NAC and the public to the Center. He indicated that the NAC would hear informative briefings from ARC staff on four topics, and invited comments, advice, suggestions, and recommendations from the Council.

Dr. Kenneth Ford, Chair of the Council, welcomed everyone to the first meeting of the newly restructured NAC. He congratulated NASA on the impressive launch of the Ares1-X rocket on October 28. The Council member and attendees took advantage of the opportunity to watch a video of the launch, which had occurred on the previous day. He noted that the NAC had an impressive morning tour of several of ARC's facilities, and he extended his thanks to Dr. Worden and his staff.

The NAC has been in existence as a FACA committee since 1977, and reports to the NASA Administrator with findings and recommendations. Dr. Ford noted that it had been his honor to serve on the Council for the past several years and as Chair for the past year. In terms of structure, the previous Council was a significantly larger group. With the arrival of the new NASA Administrator, Mr. Charles Bolden, there was a fresh look at the organization and it was determined that some changes were in order. A decision was made to restructure the NAC to be more streamlined and enable more personal interactions than would be possible with a larger group. Only the Committee Chairs will serve on the Council. One Committee was decommissioned (Human Capital), and four new Committees were added: Technology and Innovation; Information Technology Infrastructure; Education and Public Outreach; and Commercial Space. Additional Council members may be appointed as required to bring fresh perspectives and expertise. Two ex-officio members from the National Academies will continue to serve on the NAC. Dr. Ford was very pleased that 10 of the 12 members of the new Council were present at this meeting.

Each of the Council members introduced themselves and their Committee affiliation: ex-officio members Dr. Raymond Colladay from the Aeronautics and Space Engineering Board, and Dr. Charles Kennel from the Space Studies Board; Mr. Robert Hanisee, Chair of the Audit, Finance, and Analysis Committee; Col. Eileen Collins, Chair of the Space Operations Committee; Ms.

Esther Dyson, Chair of the Technology and Innovation Committee; Dr. Kenneth Ford, NAC Chair; Ms. Diane Rausch, NAC Executive Director; Dr. Wesley Huntress, Chair of the Science Committee; Mr. Miles O'Brien, Chair of the Education and Public Outreach Committee; Mr. Brett Alexander, Chair of the Commercial Space Committee; and Ms. Marion Blakey, Chair of the Aeronautics Committee. The Council represents an outstanding set of experts. The NAC was especially pleased that the new NASA Administrator, Mr. Charles Bolden, was able to be with them.

NASA Administrator Update

Mr. Bolden thanked the Ames Center Director and his staff for their hospitality. He noted that he and the NAC had enjoyed a great tour of some of the ARC facilities that morning. The NAC is an extremely important advisory group for both the Administrator and NASA. It advises him in his capacity as Administrator. Mr. Bolden asked the Council to be somewhere between advocates and auditors, and asked the members to be very candid in their advice. He noted that he had worked with most of the members of the NAC in the past and looks forward to a continuing relationship. As a former member of another NASA Federal advisory committee, the NASA Aerospace Safety Advisory Panel (ASAP), Mr. Bolden said that he understands the significant commitment that each member must make, and he expressed his gratitude for their service. By virtue of the diverse backgrounds and experience of the members, NASA will benefit greatly from their service. Each Council member will play an important role in helping NASA to meet the challenges that face the Agency.

Mr. Bolden addressed the restructuring of the NAC, which he had discussed with Dr. Ford. He noted that he had received both compliments and criticisms on the action. However, for what he wanted to do with the Council, it was much too large (35 members). He used as a model his experience on a Federal Aviation Administration advisory council on which he had served, as well as his experience on the ASAP, both of which were relatively small groups. Each of the Council members still has the assistance of a Committee that he or she chairs. Mr. Bolden emphasized that the Council had not lost any of the technical expertise or experience that it had before. He indicated that shortly after arriving at NASA Headquarters as Administrator, he had asked for an internal study to determine how the organization could become more efficient and operate more cost effectively. This study action also contributed to the decision that he and Dr. Ford reached to downsize the Council. Based upon what Mr. Bolden understood as the mission that the President has given to NASA, four new Committees were added: Education & Public Outreach (a passion for both the President and Mr. Bolden), Technology and Innovation, Information Technology Infrastructure, and Commercial Space.

Mr. Bolden noted that NASA has been in the news lately, some good and some bad. The Council would hear about the Lunar Crater Observation and Sensing Satellite (LCROSS), an Ames flight program, later in the afternoon. The successful launch of Ares 1-X made yesterday a tremendous day for everyone. Everyone should be incredibly proud. He thanked his predecessor, Administrator Mike Griffin, who brought the Constellation Program about. The final report has been received from the Augustine Committee (Review of U.S. Human Space Flight Plans Committee), and this will help NASA consider different options for continuing human space exploration. The results from that report will impact every aspect of NASA. There is an exceptional opportunity to make some radical changes in the way that NASA does business. Mr. Bolden hopes that the President will agree with NASA on extension of the International Space Station (ISS) beyond its presently planned end in 2015, and that NASA will bring about the type of inspirational activity that he wants for the Agency and the Nation, including new programs of

technology innovation. Mr. Bolden expects some great things to come out of the study. He looks forward to working with the Council over the coming years.

Speaking on behalf of the Council, Dr. Ford expressed enthusiasm and excitement about serving on the NAC and working with Dr. Bolden.

Scientific Update from LCROSS Mission

Dr. Anthony Colaprete, Principal Investigator of the LCROSS Mission, provided an overview of some preliminary results from the mission. LCROSS was conceived after the Lunar Prospector detected an increase in the hydrogen concentration over the lunar poles. LCROSS was selected to move forward quickly to provide data on the nature of lunar hydrogen. The principal questions are: What is the form of the hydrogen? What is nature of the lunar polar regolith? The next step is to investigate how the volatile processes and the lunar atmosphere work. Dr. Colaprete showed a photo of the measurement and sensing instruments comprising the LCROSS. The satellite impacted the Cabeus region of the moon on October 9, 2009. Upon impact, a plume rose above the crater very quickly. The plume was monitored both by the visible camera and the spectrometers. There were three phases of impact: the flash, the plume/curtain, and the crater. A strong dip in radiance was detected by the near infrared spectrometer after impact. Dr. Colaprete showed some of the thermal plume analyses. Rolling hills and hidden craters were revealed in frames about 30 seconds before impact in the double shadow region, which is very cold and very difficult to image. Dr. Colaprete showed data from some scans from the near infrared (NIR) spectra of impact and the ultraviolet (UV)/Visible spectra of impact. He noted some emission lines and indicated that the teams are working to identify about 50 lines from different species.

The LCROSS data collected during impact, plume/curtain, and crater exceeded expectations and will address each mission goal. The LCROSS Team is working toward presentations at the Lunar Exploration Analysis Group (LEAG) in November and the American Geophysical Union in December. The Team is also working with the multiple complementary observations from the Lunar Reconnaissance Orbiter (LRO).

Science Update from KEPLER Mission

Dr. William Borucki, KEPLER Principal Investigator, provided an update on the KEPLER mission. He reviewed the key science questions, which concern the frequency and nature of Earth-size planets in or near the habitable zone of solar-like stars. The instrument is a wide-field-of-view photometer that uses transit photometry to detect Earth-size planets. It will monitor 100,000 stars for 3.5 years. Dr. Borucki described the observations taken during the first 47 days of the mission. Several hundred eclipsing binaries and thousands of variable stars are seen in the data. Several low-amplitude transit-like signatures have been detected. Science observations began on May 12 with observations of 145,000 mostly dwarf stars. Image artifacts and image motion are a greater concern than expected and are slowing data analysis and availability. Mitigation work is underway to correct problem areas and will be complete in 2011. Until that time, it will be very difficult to find Earth-size planets in the habitable zone of stars like the Sun. Dr. Borucki showed a sample of light curves and discussed the results. A group of over 300 investigators are analyzing the light curves. Asteroseismology observations will provide characterization of planet-hosting stars, including size and age. One of the first things seen was data that initially appeared to indicate a binary with circumbinary planet, but it turned out to be two eclipsing binary stars. This showed the importance of validating all discoveries. KEPLER

measurements are being compared with ground-based measurements. Detection of the occultation proves that KEPLER has the precision to find Earth-size planets. KEPLER measurements are being compared with ground-based measurements. Papers are being prepared for two sessions at the American Astronomical Society meeting in Washington in January 2010. A similar number of papers are being prepared for special issues of *Science* and *The Astrophysical Journal Letters*. In summary, KEPLER is working well, producing discoveries, and should meet all science goals after mitigation work is completed.

In response to a question from Dr. Kennel, Dr. Borucki stated that this is the largest data set taken with this photometric accuracy. The teams expect to get rotation curves and rotation rates. In reply to a question from Mr. O'Brien, Dr. Borucki asserted that we do know what caused the image artifact—a flaw in the electronic design. This can be a lesson-learned for future missions. Each mission should look carefully at the design. In this case, some amplifier oscillation was responsible for the image artifact. Although the amplifier component had been used in other missions, it was not designed specifically for the KEPLER mission.

Green Building Initiative

Dr. Steven Zornetzer, ARC Associate Center Director, discussed a new and exciting project at Ames called “Sustainability Base.” It is also known as the “Green Building Initiative.” NASA Headquarters funded it under a program called “Renovation by Replacement” – systematically replacing antiquated infrastructure with new, innovative infrastructure. It was a competitive program among the NASA Field Centers. About three years ago, Ames won this competition and was given \$26M to build a new building. Initially, Dr. Zornetzer was not engaged in the project. About three to four months into the design, Dr. Zornetzer attended the design review and was very disappointed with the project as it was taking shape. Designers were not innovating or bringing in new technology. With the Center Director’s support he stopped the project and redirected it. The restart was inspired by the notion of “First Lunar Outpost on Earth” in terms of the philosophy of the habitat. William McDonough, one of the world’s premier green architects, also played a key role in the development of the project. The project has some bold goals: the greenest building in the Federal government; zero net energy consuming; Leadership in Energy and Environmental Design (LEED, a green building certification system) platinum plus; and a living testbed for new technologies. It will incorporate some of the innovative technologies that have come out of NASA in the past few years. There will be two basically identical wings. This would enable one wing to be used as an experimental subject, and the other wing to be used as a control subject.

Dr. Zornetzer showed a few renditions of what the building will look like. All of the trees on the site will be preserved or replanted. The building is inspired by a number of things that are inherently NASA, such as a tremendous amount of integrated photo-voltaics, which will provide both shading and energy for the building. The building will have intelligent systems built into it – it will be a living system. The work habits of the inhabitants will be analyzed to optimize work performance while minimizing energy use. This approach has been used to optimize operations of the ISS and the Shuttle. Real-time feedback to every occupant will be key to optimizing performance. The building will have a column-free interior, mindful window wall design, and raised floors to allow space plan reconfigurations based on changing needs. The exterior environment of the building will be an extension of the interior workspace, and people will be encouraged to work outdoors on a collaborative basis. The building was specifically designed and sited so as to optimize natural lighting and ventilation. The need for ambient artificial lighting will be eliminated. The building will be heated and cooled with 200 geothermal wells. Windows

will be specially designed to minimize heat gain and heat loss. Sophisticated, intelligent adaptive controls are the key that will enable the building's metabolism. Water is an important feature—the building will use 90 percent less potable water than a comparable building of its size. If there is a black water treatment facility on site, it will be derived from research on the ISS to recapture black water. The building will be a testbed – there will be a variety of areas and materials where the state of the art can be advanced and tested. Construction began last month. It will be completed and occupied in March 2011. This building will be a model for both NASA and the entire Federal sector. With respect to cost, the additional cost delta of this building over a traditional building will be recaptured in five years. After five years, the marginal operating cost of the building will be close to zero.

In response to a question regarding who would occupy the building, Dr. Zornetzer noted that the intention initially was to put institutional support people in the building. However, he would like to see a portion of this building reserved for collaborative work by scientists and engineers. Various groups have expressed significant interest. People will be able to monitor the performance of the building on the web, and there will be an educational facility in the lobby of the building.

Dr. Ford commented that it is gratifying to see that NASA is showing leadership in this area. In response to a question, Dr. Zornetzer indicated that the unique ARC intelligent adaptive controls would be implemented on top of a high-quality, commercial Siemens system. If something fails in the Ames enhancements, operations would automatically revert to the Siemens system.

Virtual Institute Concept and Execution

Dr. Carl Pilcher, Director of the NASA Astrobiology Institute (NAI), discussed one of the “Virtual Institutes” at ARC. He first provided some background about astrobiology itself. Astrobiology addresses three fundamental questions: How does life begin and evolve? Does life exist elsewhere in the universe? What is the future of life on Earth and beyond? NASA has been engaged in research into these questions for many years, but a catalytic event on August 7, 1996 – the possible evidence of biological activity in Martian meteorite ALH 84001 – thrust astrobiology ahead. Although the science community is in consensus today that there was not biological activity in ALH 84001, this event triggered many others. It led to an announcement of a space summit with the Vice President; to a new Origins Program with a \$1B per year increase in NASA's science program, and to a new Astrobiology Program. That event also catalyzed a recognition that several areas of scientific investigation had matured to the point that the time was ripe to bring these areas of scientific discovery together. Evidence of the diversity of life reflected an ability of life to inhabit very diverse and hostile environments. Also, planets were being discovered around other stars. Another area that had come to maturity was the understanding that the ingredients of life are made in interstellar space and are delivered to inhabitable planets such as the Earth. Collaboration was needed, and all of these communities needed to be brought together. What was needed was a “virtual institute.” This was the rationale for forming the NAI – a virtual institute without walls. Currently, there are about 600 members at about 150 participating institutions. A central office at ARC manages the institute. In addition, there are a number of international partners. Since inception, there have been five competitions (cooperative agreement notices) for the teams.

The mission of the NAI is to carry out, support, and catalyze collaborative interdisciplinary research, train the next generation of astrobiology researchers, provide scientific and technical leadership on astrobiology investigations for current and future NASA missions, explore new

approaches using modern information technology to conduct interdisciplinary and collaborative research, and support education and public outreach. The NAI requires the formation of broad, interdisciplinary teams to address questions in astrobiology requiring collaboration between diverse disciplines. It further integrates these teams with each other and the community to address timely issues in astrobiology emerging from current research and space flight mission planning. The NAI also creates a broad, interdisciplinary forum in which individual researchers can consider the “big picture.” A great deal of emphasis is placed on communication. Dr. Pilcher encouraged the NAC to explore the NAI website: www.astrobiology.nasa.gov/nai.

The use of collaborative tools is essential to the NAI. There is a tremendous videoconferencing capability. The international partnerships provide access to sites that NASA would not ordinarily have. Other organizations have been formed in response to the NAI. When the National Academy of Sciences (NAS) reviewed the NAI, it concluded that the NAI had fulfilled its original mandate and should continue to be supported. It has played a key role in supporting the development of astrobiology and has positively affected NASA’s current and future missions. Dr. David Morrison, Director of the NASA Lunar Science Institute (NLSI), discussed the NLSI and the overall role of virtual science institutes at NASA. The NLSI supplements and extends existing NASA lunar science programs through a nationwide, connected network of teams. It builds on the experience base of the NAI. It is sponsored by the Science Mission Directorate and has significant support from the Exploration Systems Mission Directorate. It was initiated because NASA wanted to get a running start on a new lunar program, and the fastest way to do that was to create a virtual institute to take advantage of all of the researchers in academia and industry. The NLSI mission statement is very similar to the ASI with one exception: it does not highlight collaborative tools, which already has considerable focus under the ASI mission. Lunar science is broadly defined. It includes investigations of the Moon, investigations on the Moon (including human presence), and use of the Moon as a platform for performing scientific investigations, including observations of the Earth and other celestial phenomena that are uniquely enabled by being on the lunar surface.

The NLSI is a year and a half old. Teams were brought on board about six months ago. ARC hosts a NLSI Lunar Science Conference every summer on the anniversary of the Apollo landing. Currently, there are seven teams. The NLSI has a program of international partners – three so far – and is on the verge of signing three more. Education and public outreach is very important. The teams themselves devote up to five percent of their budget to this area, and the NLSI provides additional support.

Virtual institutes have a much broader application in NASA. They can be created quickly in response to NASA requirements. NASA funds are highly leveraged since team members are already largely funded by universities and NASA Centers. The best scientists are brought into the NASA family without the need to construct buildings or recruit civil service scientists. NASA retains management, ensuring that work is linked to NASA missions. Since many teams are university based, NASA gains access to labs, students, and post-docs.

Research teams are multi-disciplinary and multi-institutional. Emphasis on teamwork, using the most effective information technology tools, enables broad collaboration. Partnership with the best universities provides opportunities for NASA to contribute to undergraduate science education. NASA can best accomplish training the next generation of scientists through partnerships with universities.

Institutes could be useful in any field where NASA needs extramural scientific and technical expertise and faces challenging new problems demanding fresh, multidisciplinary perspectives.

Two examples of potential institutes are: Climate and geoengineering, to seek and evaluate technical solutions to mitigate global warming; and radiation biology, understanding the risks and devising countermeasures that will permit safe travel of humans beyond the Earth-Moon system.

Dr. Huntress inquired about the circumstances that would demand a science institute versus a standard grants program. Dr. Morrison noted that both are needed. Dr. Pilcher added that “collaborate” and “multidisciplinary” are the key words for a virtual institute. It serves to bring people and institutes together.

General Discussion

Dr. Ford opened the floor for comment, discussion, and deliberation on what the Council members had heard at the public meeting as well as the tour of the ARC facilities.

Ms. Dyson suggested that at the next meeting, a more functional room arrangement be employed by which the public could better observe the NAC meeting. Mr. Alexander concurred. Dr. Ford asked the Education and Public Outreach Committee to take an action to offer some suggestions for a meeting arrangement that might provide better a better experience for the public.

Ms. Blakey complimented the group on the combination of work that was portrayed here at Ames – everything from near-term practical to next generation, e.g., the work with the San Francisco Airport to Astrobiology. Mr. Alexander noted that five or ten years ago, Ames made a strategic decision to diversify and form partnerships with the surrounding business community as well as other science areas across the country. It is now coming to fruition, and ARC has some great activities across the spectrum that can be brought into exploration as well as the science missions. That aspect is missing at some of the other NASA Centers. Ames is in a good position because of what it can draw upon from the surrounding community.

Dr. Colladay added that the NAC saw only a small fraction of what goes on at Ames. There is a lot of extraordinary work here, and the NAC should have an opportunity to see some of it.

Dr. Huntress was impressed with the ARC’s decision to be the center in the Agency that learns how to assimilate large amounts of data and compute and display it for both scientists and the public. Dr. Ford noted that the things that the NAC saw today in high performance computing as well as at the Intelligent Robotics Group could be traced back to the mid-to-late 1990’s. As the technology moved forward, ARC has stayed at the forefront of high performance computing for science and engineering. The Intelligent Robotics Group develop technologies that not only will enable efficient planetary surface exploration, but that also can serve as the basis for strong public outreach or participatory exploration.

Mr. O’Brien indicated that he had been thinking about how to connect with the public and keep the public engaged. The human space flight program sometimes takes the oxygen out of other efforts to talk about what NASA does. What the NAC saw here was a lot of energy and openness among researchers and with the public. They are trying to answer some intriguing questions.

Ms. Dyson remarked that one of the noteworthy things she observed during the Ames tour was the idea of “small” (used in relation to the small satellite program, as it pertains to cost and schedule), and how it impacts consideration of risk. She wondered about whether it might be better to try ten small efforts, even if you fail on three of them, rather than spend three times as much time and money on a single effort. Dr. Ford noted that this is another case of necessity

driving ARC into an interesting new line of work. In this, and other cases, they have moved into niches previously under-served in the Agency.

Dr. Kennel responded to Ms. Dyson's remarks and talked about the dynamics of risk in projects of this kind. When something in a high-risk venture goes wrong, someone in Congress calls someone from NASA Headquarters to account. It is difficult to withstand the emotional aspects of that, and conservatism and restrictions start creeping back in. It takes considerable commitment to have a program like this, and to advertise in advance that there may be failures. Dr. Kennel also commented on the green building initiative. It is true that 40 percent of all carbon emissions come from heating buildings. An average building has a 40-year lifetime. If one replaces every old building with a green building, it would still take over 40 years to have an impact on the carbon load. He asked if ARC has any future intent to retrofit older buildings. It was noted that this is a lot tougher, and so far, there isn't a plan to do that. It is easier and less expensive to build a new structure.

In the context of the morning tour, Dr. Ford noted that the success of high performance computing (HPC) at ARC was not only due to their very capable hardware, but also the staff is spending a lot of time and effort helping Principal Investigators who aren't specialists in HPC develop codes that effectively use the computational resources. The human side is the key to what is going on in the facility. Mr. Alexander observed that what NASA spends for supercomputing – about \$40M – is a modest expenditure for HPC at this level of capability.

Dr. Kennel commented on high volume data acquisition. The results of KEPLER and the Beyond Einstein astrophysics program will produce large data sets. He noted that there will be a temptation to not focus on the tremendous amount of data that is background for the prime mission, but over a long period of time it could have an impact.

Dr. Ford commented again on the impressive work that the NAC saw when they visited the Intelligent Robotics Group. Technologies such as those demonstrated will lead the way for participatory exploration – the same tools that are being used to plan, operate, and accomplish planetary exploration...can also be used to enable wider participation.

With respect to risk and what the NAC heard about small satellites, Dr. Colladay noted that the Defense Advanced Research Projects Agency (DARPA) celebrates its failures if the failures teach something. The community expects that of DARPA. That is not true of NASA. It would be hard to separate a subset of NASA's culture and say that it is OK to fail if the benefit is sufficient. NASA would find it difficult to manage tools of mission non-success. It is not easy to tell one segment of NASA's culture to take risks and manage that so that it is helpful to the Agency.

Dr. Ford agreed that this is a critical issue. NASA lives in a fishbowl in a way that the DoD doesn't. It is different from other agencies. If a significant technology R&D program is reinstated at NASA, it will be critically important for it to reach for the hard problems, not just pick the low-hanging fruit.

Dr. Huntress noted that in the past, NASA did have a program to test new technologies called New Millennium. That program was advertised as a flight demonstration program where NASA would conduct flight tests.

Ms. Dyson observed that NASA is not the only institution that is struggling with heightened expectations. It is important to make the distinction between where risk is acceptable and where it is not. Col. Collins noted that this goes hand in hand with leadership. NASA must look at why

things fail. If you fail after identifying the risk and putting a control in place, and then you learn something. That message needs to get out. Dr. Ford added that NASA often doesn't like to tell the public just how hard some things are. Moreover, it is important to recognize that to attempt to do something routine and then to fail is to appear inept, but to attempt to do something great... something truly hard ... and fail, that is heroic.

Dr. Ford then moved the discussion to the near-term work before the Council. Each Committee is reconstituting its membership, and excellent progress is being made. A "Terms of Reference" document must be developed for each Committee, and that activity will be started shortly. Dr. Ford indicated that he would be working with the Committee Chairs to develop TORs for their committees. He invited members to look at the 2009 Work Plan to see how it is structured, and to think about the plan for their committee in 2010. At the next NAC meeting, Committee reports will be re-established. Each Committee Chair will report to the Council on what it saw, what it learned, and what observations or recommendations the committee would like to make. The Chairs will bring forward recommendations to the Council, which will then deliberate on them with the goal of arriving at something actionable and relevant, to which the Administrator can respond. This process has worked well in the past.

Dr. Ford reviewed the plans for the next meeting, which will be at NASA Headquarters on February 18, 2010. The Council will not have a tour at that meeting, so members should plan to arrive on February 17, have dinner together that evening, and work all day on February 18. He indicated that they will try to make the schedule of one day work, but if that is not possible, to leave time on their schedules to make the meeting a day and a half in duration.

Other meetings during FY 2010 will be:

- April 27-29 at Johnson Space Center
- July 20-22, location TBD
- October 5-7, location TBD

Dr. Ford reiterated that all of the NAC presentations seen at the meeting today would be available on the NAC website soon. Committee memberships will be put on the site soon. He thanked the public for their interest and attendance at this meeting and invited their comments. One comment concerned the issue of risk and failure and how it can be handled. We need to encourage the younger generation and help them see that failure is not the end of the world, but is one of the important ways to learn. Dr. Ford agreed that this is an important issue. A good technology demonstration program, such as the aforementioned New Millennium Program, can attract the best and the brightest technologists who often find such efforts more exciting than the flagship science missions where failure is not a viable option. In light of the Decadal Surveys, Dr. Kennel asked whether it would help if the Academies identified areas in which they would appreciate a higher-risk, innovative approach. All seemed to think this a good idea.

Dr. Ford thanked the Executive Director, all of the members of the Council, and the Council staff for their participation and support. The meeting was adjourned at 4:20 p.m.

NASA ADVISORY COUNCIL

**NASA Ames Research Center
NASA Research Park
Conference Center, Building 3 – Ballroom**

October 29, 2009

1:00 – 4:00 pm

Meeting Agenda

1:00 – 1:05 pm	Call to Order and Announcements	Ms. Diane Rausch, Executive Director NASA Advisory Council, NASA HQ
1:05 – 1:10 pm	Remarks by Council Chair	Dr. Kenneth Ford, Chair NASA Advisory Council
1:10 – 1:20 pm	Welcome to NASA Ames Research Center	Dr. Simon P. “Pete” Worden, Director NASA Ames Research Center
1:20 – 1:35 pm	NASA Administrator Update	Mr. Charles F. Bolden, Jr. NASA Administrator
1:35 – 2:00 pm	Scientific Update from LCROSS Mission	Dr. Anthony Colaprete LCROSS Principal Investigator
2:00 – 2:25 pm	Scientific Update from KEPLER Mission	Dr. William Borucki KEPLER Principal Investigator
2:25 – 2:45 pm	Green Building Initiative at ARC	Dr. Steven Zornetzer, Associate Director NASA Ames Research Center
2:45 – 3:15 pm	Virtual Institute Concept and Execution	
	- NASA Lunar Science Institute	Dr. David Morrison, Director NASA Lunar Science Institute
	- NASA Astrobiology Institute	Dr. Carl Pilcher, Director NASA Astrobiology Institute
3:15 – 4:00 pm	General Discussion/Next Steps	All
4:00 pm	Adjourn	

NASA ADVISORY COUNCIL MEMBERS
October 2009

<p>Dr. Kenneth M. Ford Council Chair <i>Founder and Director, Florida Institute for Human and Machine Cognition (IHMC)</i></p>	<p>General Lester L. Lyles, USAF (Ret.) Chair, Exploration Committee <i>Consultant, The Lyles Group</i></p>
<p>Ms. P. Diane Rausch Council Executive Director <i>Designated Federal Official NASA Headquarters</i></p>	<p>Dr. Wesley T. Huntress, Jr. Chair, Science Committee <i>Director Emeritus, Geophysical Laboratory, Carnegie Institute of Washington</i></p>
<p>Ms. Marion Blakey Chair, Aeronautics Committee <i>Chief Executive Officer, Aerospace Industries Association</i></p>	<p>Colonel Eileen M. Collins, USAF (Ret.) NASA Space Shuttle Pilot and Commander (Ret.) Chair, Space Operations Committee <i>Aerospace Consultant, President of Space Presentations, LLC</i></p>
<p>Mr. Robert M. Hanisee Chair, Audit, Finance, and Analysis Committee <i>Managing Director, Trust Company of the West</i></p>	<p>Ms. Esther Dyson Chair, Technology and Innovation Committee <i>EDventure Holdings</i></p>
<p>Mr. Brett Alexander Chair, Commercial Space Committee <i>President, Commercial Spaceflight Federation</i></p>	<p>Dr. Raymond S. Colladay, Ex-Officio <i>Chair, Aeronautics and Space Engineering Board, National Academies</i></p>
<p>Mr. Miles O'Brien Chair, Education and Public Outreach Committee <i>Miles O'Brien Productions</i></p>	<p>Dr. Charles F. Kennel, Ex-Officio <i>Chair, Space Studies Board, National Academies</i></p>

Other Attendees:

Engola, Mary
Grady, Jim
Mobilia, Sean
Hand, Eric
McCohon, Linda
Werner, Debra

Ball Aerospace
SGEEI
GEI
Nature
BAH
Space News

LIST OF PRESENTATION MATERIAL

- 1) LCROSS Mission Update [Colaprete]
- 2) KEPLER Mission Update [Borucki]
- 3) Sustainability Base [Zornetzer]
- 4) NASA Lunar Science Institute [Morrison]
- 5) NASA Astrobiology Institute [Pilcher]