

National Aeronautics and Space Administration
Office of Education

Education Advisory Committee Meeting

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Jet Propulsion Laboratory
Pasadena, California

MEETING REPORT



Dr. William Harvey
Chair, Education Advisory Committee



Dr. Katie Blanding
Executive Director

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Introduction

Dr. William Harvey, Chairman of the Education Advisory Committee (EAC) opened the meeting, welcomed members, and made introductions around the table.

Welcome to the Jet Propulsion Laboratory by Director Charles Elachi

Dr. Bernice Alston provided a detailed introduction for Jet Propulsion Laboratory (JPL) Director Dr. Charles Elachi, who presented an overview of the laboratory, beginning with how JPL helps to obtain answers to NASA's compelling questions: How did we get here? Where are we going? Are we alone? Why do we explore when there are so many other practical concerns? The critical question is what led to the development of intelligent species. The existence of other intelligent species in the universe is an amazing prospect, however an equally astonishing discovery would be a complete absence of other sentient life. Dr. Elachi described his team leadership of the Cassini-Huygens mission to Saturn, which was poised to send its first radar images to Earth on October 25, 2004. Missions such as Cassini can inspire the next generation of explorers, a role also subsumed by the NASA Office of Education. NASA represents 46 years of space and aeronautics exploration. There are 16 JPL spacecraft now in flight in the solar system, including 4 near or on Mars. Photos of the Mars Endurance crater and its sedimentary layers were shown, suggesting that water had

indeed been present on Mars at one time in its planetary history. The Mars Rover has drilled sites in the crater, showing presence of sulfates that indicate mineral deposition from water. Hematite (iron oxide), which also forms in the presence of water, is evident on Mars as well. Over 15 billion hits to the NASA website and the Mars Rover pages have been recorded during the course of the Mars mission. The long-term program for Mars Exploration was presented, including a Mars Science Laboratory that may have the ability to perform chemical and biological experiments *in situ*, and a planned Mars Sample Return mission for 2013. A Mars mission is planned for roughly every two years (every 26 months, in concurrence with the relative positioning of the planets).

The Cassini-Huygens mission to Saturn and its large moon, Titan, was conceived of 20 years ago, and is just now coming to fruition. In early 2005, after flying by and obtaining radar images of Titan, the Huygens probe will be dropped into Titan's atmosphere and onto the surface to attempt to discern evidence of a pre-biotic environment, with constituents such as methane. Titan is believed to have some characteristics in common with Earth's composition and atmosphere soon after its formation. The probe will also send history's first pictures of Titan's surface, now obscured by a densely opaque atmosphere, back to the Earth. Other JPL missions include Stardust and Deep Impact, which are spacecraft that will impact, sample and photograph the comets Wild 2 and Tempel 1. Microwave Limb Sounder is a mission that will examine the development of the Antarctica ozone hole. Genesis, a solar wind sampling mission that recently experienced a near-catastrophic return to Earth, has yielded data that is now undergoing analysis, with the hope of extracting some useful information.

JPL offers Summer Education programs for students in high school, college, and graduate school, and hosted 436 individuals last summer. Dr. Elachi expressed concern about the status of the Summer Faculty Fellowship Program and fervently hoped that this program will continue. JPL also wants to approach more students at the pre-college level. The JPL faculty is mostly post-secondary, with a few K-12 instructors. The undergraduate numbers are trending up, but the graduate population has remained level. There are a number of graduate students from the California Institute of Technology (Caltech) who carry out their thesis work at JPL. There are also student employment programs, spanning academic and cooperative education. In 2004, 58 of 162 new hires were conversions from student programs. An EAC representative raised a question about the diversity of the student population. Dr. Elachi replied that over 14% of students are from minority institutions. JPL is trying hard to represent the diverse ethnic distribution represented in Los Angeles. A sampling of student employee profiles was presented. Everyone wins through student employment: the student (scholarships, real world learning, resume-building), employer, and society. Dr. Elachi felt it heartening that different administrations have supported investment in science at NASA. He foresaw a permanent presence on Mars, a totally accessible Internet connection to NASA instruments, and further exploration of Jovian and Saturnian satellites.

An Advanced Planning and Integration program, headed by Dr. Elachi, has been put into place at the behest of NASA Administrator Sean O'Keefe. Beginning with the Nation's Vision for Space Exploration, NASA has a set of objectives that reflect this vision (one of which is specifically tied to Education). Capabilities, competence and infrastructure are being identified to determine, and foresee, a technology roadmap to support the steps that need to be taken to make the Exploration vision possible. In response to this vision, there are 12 separate roadmaps, one of which is the Education roadmap (number 11).

Dr. Bernice Alston mentioned that the Office of Education believes that an Education representative should be on each roadmap committee, as the integration aspect of Education's function is very important. Dr. Elachi expressed his mild frustration with the slow pace of government action on certain initiatives surrounding roadmap development.

Dr. Elachi professed the belief that education is a lifetime experience; thus NASA must look at all levels of education. Clearly the long-term workforce needs to be included in continuing education. A participant asked: in industry, how do we do R&D outside the walls of the corporation. What sort of framework is used to determine the pipeline? How is the R&D federated? Dr. Elachi responded that each roadmap committee should be balanced with internal and external membership. Implementation is the purview of the Associate Administrators at NASA Headquarters (HQ). Currently, for 14 JPL projects, 2 are in-house, and 12 are out-of-house. Competitive sourcing is the key, however NASA must also be able to make more investments at universities for building complex space hardware. It will take about 9-12 months to develop these roadmaps- this extended time period will be a good opportunity to collect many viewpoints and make appropriate evaluations. Dr. Alston noted that NASA must also merge legacy programs into the effort and move them forward. A list of the Strategic Roadmap chairs was presented. Former Astronaut Dr. Sally Ride, who is very engaged in reaching young people, will also be involved in the education roadmap strategic planning.

Dr. Elachi felt it was necessary to re-engage industry giants (such as Lockheed-Martin) in offering fellowships to students; he has seen these fellowships drop off during his teaching tenure at Caltech. Dr. Harvey noted that as it is only the third meeting of the EAC, and in view of the changes at NASA, Dr. Elachi's information still pushes the committee back against the larger issues. Dr. Elachi averred that one to two percent of every mission's budget goes to education, which JPL takes very seriously, but the facility also had to turn away 35,000 student visitors last year due to

lack of facilities. Therefore, JPL is adding an education center to help address this issue, in an attempt to accommodate 80-90,000 students per year; the hope is to have it online in 2 years.

Ms. Senta Raizen asked if an evaluation plan were available for each of these programs, and if desired outcomes had been identified. Dr. Elachi replied that he makes an effort to phone participants and has also made a habit of visiting schools. JPL is in the process of making outside evaluation a formal task for the more mature programs. Some programs are not as mature, and some legacy programs did not have evaluation funds built in.

Ms. Carol Ramsey mentioned visits to Challenger centers and asked how JPL is integrating what is known to be effective into new programs. Dr. Elachi said he was getting first-hand input from local schools on this issue. Formal approval of the FY05 budget has not yet been obtained. JPL's role is to provide tools and excitement to the teachers, not the actual education. Dr. Harvey observed that the numbers of individuals interested in JPL is replicated in centers across the country and was curious as to what JPL is doing that is effective. Dr. Harriett Jenkins asked Dr. Elachi if he felt that the educational programs are the best and most effective, or if there are other things that can be done. Dr. Elachi was generally satisfied with what is being done, given the means available. When on tours, he has been impressed with the students' questions- they have been well prepared by their teachers. He knows that other center directors take education very seriously, as does Administrator O'Keefe. Dr. Elachi was not a believer in homogeneity- each program must be shaped to the regional demographics.

Dr. Harvey asked what the Chief Education Officer's (CEO) role should be. Dr. Elachi felt that the CEO must have oversight, but must not necessarily control the funding. The current approach is that the money is in the programs and projects, with its percentage of Education funds specifically allocated. Ms. Raizen expressed concern with a discrepancy of funding allocated largely to graduate students. Dr. Elachi agreed to retrieve those numbers. The 1-2% rule applies to the Office of Space Sciences, which categorizes the funding into formal education, informal education and public engagement.

Mr. Wayne Johnson expressed concern about the general decline in hard science investments and deficiencies in talent, and felt that NASA had played a big role in the past; NASA can't solve it by itself. It's a competitive issue worldwide. Dr. Elachi felt that NASA was trying to keep the issue in front of the representatives, but also continues to fan the excitement of the Space Exploration Vision. The enthusiasm overshadows other issues. The other issue is the possibility of being overwhelmed economically by other countries.

Spirit of Exploration DVD Presentation

Dr. Parvin Kassaie, Manager of Education Programs at JPL, introduced a DVD recording entitled "Spirit of Exploration" (a hard copy of the DVD was distributed at the meeting), detailing the most recent JPL Mars exploration mission.

A Systems Approach to Portfolio Management at NASA

Mr. Douglas Stetson addressed the process of transformation of the NASA organization that had been prompted by the new Space Exploration Vision. The new vision will require a strong emphasis on focusing, prioritizing and integrating activities to achieve NASA objectives. The headquarters transformation details were briefly touched on. The Strategic Planning Council, the Operations Council, and Director for Advanced Planning (Dr. Elachi) are the three major components for developing the new organization. The Associate Deputy Administrator (Mary Kicza) for Systems Integration will work with

Dr. Elachi in the Advanced Planning and Integration Office (APIO). Dr. Elachi and Ms. Kicza were described as a team for maintaining oversight on the planning and integration activities.

Old versus new processes of strategic planning were graphically displayed, showing the APIO presiding over the mission directorates. The scope of the integration process was characterized, including the integration planning, strategy and capabilities, budget, and architecture. Dr. Alston asked how Education fits into the process. Mr. Stetson provided his interpretation, couched in the language of the 13-14 agency strategic objectives, which was to identify education specialists and assign them to all the roadmaps being prepared. This interpretation agreed with the prior efforts by the EAC to provide recommendations for such individuals. In addition, the Education roadmap team would serve as a voice for the Education platform. Ms. Ramsey asked how these individuals are tied back to the mission. Mr. Stetson replied that there would be an initial call to the representatives to report on their experiences on the individual roadmaps. Pending those results, another subset of representatives may be created to serve some other Education categories.

The strategic planning framework was briefly discussed- one point to bring out was that the National Academy of Sciences (NAS) and the National Academy of Engineering (NAE) have been engaged to review and evaluate the roadmaps. The roadmap teams are not NASA-centric; they will include industry and academia in addition to NASA employees. The process of managing requirements has received a lot of attention recently; they should be directly traceable back to the top level of the NASA vision. NASA is trying to achieve this traceability through the Program

Management Council, and is also in the process of articulating the chain of approval for making changes in these requirements. For architectural requirements, for example, the approval source would be Ms. Kicza.

Mr. Stetson felt that the APIO now plays a well-understood role in achieving NASA objectives, through its role in integrating workforce analyses, and developing new initiatives, roadmaps and an agency strategic plan. Twelve strategic roadmaps will be developed along with fifteen capabilities roadmaps. Ms. Alston mentioned that Education has already expanded its efforts in including workforce capabilities as an objective, which involves Ms. Vicki Novak and her shop (Office of Human Capital Management). Mr. Sefton recommended further synchronization between Education and Ms. Kicza as the APIO works to identify core competencies. The roadmap schedules were presented. An important concern is to synchronize the roadmaps with the Program Operating Plan (POP) cycle, the agency's budget schedule, in order to influence the NASA budget.

Mr. Johnson commented that compiling such data is a 9-12 month process and that NASA should not beat itself up on the perceived lengthiness of the task thus far. The other point is that this is not a one-time activity; the transformation and compilation of roadmaps and strategies are in fact meant to lead NASA on an ongoing basis.

A participant observed that NASA needs to have a better definition of pipeline, which is essential to populating the workforce, and also the contrast between defining pipeline needs for NASA and pipeline needs for the U.S. workforce in general. Ms. Raizen was not sure that this is transparent to the public. Mr. Stetson replied that issue is the connection to what NASA does and why it is important. The roadmaps are a tool for making these connections. The three co-chairs of each roadmap report to the director of Advanced Planning, and the Strategic Planning Council will be the final authority. In summary, the roadmaps are the 75% solution to achieving what is realistic in the transformation process for the first year. Dr. Harvey noted that the EAC is trying to absorb and reconcile the rapid changes experienced over three meetings. Mr. Johnson applauded the decision to add the NAS and NAE to the effort to formulate recognition of national goals. The NAE also manages the Government-University-Industry Research Roundtable (GUIRR); this may help to convey what NASA is doing in the context of what other government agencies are accomplishing in overlapping areas. Ms. Ramsey asked about the ramifications of the presidential election outcome. Mr. Stetson's personal view was that what is being put in place is general good management practice that, ideally, will be independent of the current Administration.

To Inspire the Next Generation of Explorers

Dr. Bernice Alston presented the briefing in lieu of the Chief Education Officer, Dr. Adena Williams Loston, who was absent due to illness. As NASA goes through the transformation, initiatives are still ongoing, scholarships are being offered, etc. The transformation impacts Education on a daily basis? Who's in charge? How do we reconcile this to budget realities?

The Office of Education, which reports to Mr. O'Keefe through Deputy Administrator Mr. Frederick Gregory, continues to maintain direct responsibility for all education-related activities. The Chief Education Officer is responsible for improving scientific and technological literacy. Dr. Harvey requested an organizational flow chart for NASA. It was clarified that Dr. Loston reports to the Administrator. Dr. Jenkins felt that the terminology surrounding "advocate" versus "who has the money" was not clear.

Dr. Alston replied that Education has a significant role in the Agency, and is trying to break down some "stovepipe" barriers. The Administrator is very involved on a regular basis. The Office of Education, through the transformation of agency management, is involved in policy. It is critical to have Education's role spelled out in NPR 1000.3. There is a tiger team (including representatives from the National Science Foundation and the U.S. Department of Education) that meets regularly to get a pulse on what is working on a national basis. Presidents of universities were invited to this effort to look at pre-service education to identify connections between content areas and teacher training.

Dr. Philip Clay asked if the Education Office would like to have an impact that it does not currently possess. Dr. Alston replied that the Office has not requested budget control, but does want more input into integration. Dr. Jenkins noted that the language is "oversight" over "education investment", and that having this sort of oversight can be extremely valuable. Ms. Diane Bray added that POP envisions budget objectives that align objectives specifically with Education. Concentrating on goals and objectives will help clarify the integration piece. Mr. John Jordan asked if there was expertise within Education to identify and implement NASA opportunities. Dr. Alston replied in the affirmative. Mr. Jordan observed that engineers and scientists are capable of communicating with educators. Dr. Alston has found skepticism amongst scientists as to how Education will use their cooperation; furthermore, Education is looking for "president-proof" strategies. Education has a place on all the necessary planning and strategic groups. Mr. Jim Stofan added that JPL's team of professional educators become part of the missions as they go forward. All the resources are in place at JPL's Education Office. JPL is not trying to replace the scientists, as students are excited to meet them, rather JPL is trying to facilitate their interaction. Ms. Raizen commented that the centers have always found ways of interacting with some of the Education community- the struggle is having a plan that makes sense of the overall strategic goal.

Dr. Alston offered a recent example of good integration as the planning associated with the Education center currently being planned for JPL; this is evidence of better involvement of Education with the rest of NASA. The Education Office is trying to give guidance to NASA as to how to meet its stated objectives. Strategies include involvement of the education community, generating new communities of learners, fostering the research community, and engaging citizen explorers. The cross-cutting function of Education includes the development of NASA Policy Guidance establishing the relationship between Education and other offices. The Education office has concurred, through joint planning with centers, on how the budget will be implemented for Education activities. A participant asked: where is the pressure on the centers if they do not agree? Ms. Bray replied that the centers have already committed their Education money in terms of personnel and center budget through full-cost accounting directives. If there is no concurrence, the matter is elevated to the attention of the Operations Council (OC); if the matter is not resolved at the OC, it goes to the Strategic Planning Council. It is at the root of the process of negotiation.

Ms. Raizen could make no sense of the money flow, as presented, which was an important criterion for implementation. Dr. Harvey added that there are many factors. The Office of Education budget, Education dollars in the directorates, and the Education dollars in the centers are murkily represented; the EAC can't get a handle on it. The centers have monies separate from the Office of Education; this is referred to as burden funding or center G&A (percentage of funds to be spent on Education). Ms. Raizen commented that the only negotiated funds are those that flow from the Office of Education. Much discussion ensued on what portion of monies was actually under the control of the Office of Education. Dr. Harvey asked whether it was possible to influence monies spent at JPL and added that it sounds like the Education Office has less control over the individual center's Education allocation when it comes to addressing regional inequities, for example. A participant commented that NPR 1000.3 is trying to express this more rigorously. Ms. Raizen maintained that until EAC has complete clarity, it couldn't do its job.

A participant commented that it is disturbing to hear that Education is begging the people it is funding to do what Education is requesting. Dr. Jenkins claimed that the EAC has gotten different answers each time it has met. Dr. Harvey cited the need to get information in the form in which the EAC had requested it; action items were given at the previous meeting and the EAC has not received answers. Ms. Raizen added that the EAC would benefit from more background information in advance of committee meetings. Ms. Raizen commented that she saw no evidence of integration or a shared vision. Mr. Johnson asked for information on how Education aligns resources with outcomes and wanted to know what monies are in each bucket.

Dr. Alston described how Mr. James Jennings, Associate Administrator for Institutions and Management, is in the process of examining the entire agency in terms of how other monies (outside of the Office of Education itself) for education are allocated. Dr. Harvey asked how new initiatives and cancelled out programs were being reconciled. Dr. Alston replied that the Education Office has determined where duplications have occurred and has eliminated them. The FY05 budget request for the Office of Education was presented, which provided some breakdown of budget in terms of procurement, personnel, travel, corporate G&A, center G&A, and service pools. Dr. Jenkins asked when information for specific schools in specific regions would be made available. Dr. Alston was unsure if that level of detail would be attained in the first-pass analysis, and agreed that the budget breakdown must be better represented. Dr. Stiff wanted to know where the collective reasoning is located in determining how the center money is being spent, and how the centers report on how they are spending Education dollars. Dr. Alston agreed that it is difficult in some cases to obtain such information. Dr. Kassaie offered the observation that her job at JPL is to see how each mission adheres to Education guidelines (increasing the pipeline, ensuring diversity, and upholding the 6 principles elucidated by Education). All centers follow these guidelines.

Dr. Clay said that he had hoped to hear that the Agency has figured out how it will use its resources and missions in the interest of education, and how the Office of Education is leveraging the available budget, its relationship to centers and universities, etc. If there is a clear message, the centers must adhere properly to Education guidelines and it will be just a matter of contracts and budgets. Dr. Alston replied that the Office is aware that it still does not have its arms around the budget, and promised to rectify the absence of requested information.

Mr. Johnson noted the Faculty Fellowship Program was in jeopardy. Dr. Alston assured him that while the budget is cancelled, JPL would still administer the program under different guises (at a level of about \$2-2.5M). Mr. Johnson asked about the strategic intent of such a move. Dr. Harvey commented that it appears to contravene the strategy. Dr. Weiner stated that there is a lot of pressure to fund the program, which strongly ties in to existing mission directorates. Dr. Jenkins observed that the EAC might recommend making this transparent, in writing. Dr. Clay noted that when a program is lost, so is communication - the people NASA wants to reach will assume the program is cancelled. Ms. Raizen wanted to follow the process on how the decision to fund is made.

Dr. Harvey observed that the presented budget is essentially flat, with a decrease in academic programs due to earmarks. While the set of draft recommendations is well composed, how is NASA going to pay for it? Ms. Bray explained that instead of having a large set of programs with a lot of cost due to infrastructure, Education wants to

reallocate funds, close out programs that have served their purpose, and begin new initiatives in emerging areas. The Office has also been asked to create sunset provisions. Dr. Clay expressed the need to understand what NASA will be supporting, including resources and qualifications. Dr. Harvey commented that the inference from the draft recommendations seems to point to new initiatives. Ms. Bray recognized the existence of a flat line budget, which is driving some of these initiatives. Dr. Jenkins wanted to see how ongoing programs influence objectives. Dr. Clay commented that “learning community” doesn’t mean much and recommended reducing that long phrase to collaboration. Ms. Ramsey noted that leveraging other people’s money implies incomplete accountability and that it seemed that Education is still begging its funding receivers to conform to Education’s requests. Dr. Alston agreed that it is a culture change. In summary, Dr. Alston felt that Education was moving in the right direction.

Education Programs at the Jet Propulsion Laboratory

Dr. Kassaie introduced an overview of Education programs at JPL. Because Caltech manages JPL for NASA, the JPL staff is comprised not of civil servants, but Caltech employees. However, by contract, JPL carries out NASA’s Education objective. The Composite Laboratory organization was illustrated by flow chart. The Office of Communications and Education (OCE) is split into Education and Public Engagement. In the past 4 years, JPLs’ OCE has won NASA’s highest “excellent” ratings in NASA’s report card, increasing the award fee for the laboratory. Some funding differences are used for implementing different NASA offices. Mr. Johnson commented that this was another example of a different source of money; this is HQ money implemented outside of the Office of Education. Dr. Kassaie explained that since JPL is a space science center, it has many programs associated with each mission’s Education component. Thematic Education and Outreach activities are funded by missions, and partitioned into Mars, Earth, Solar System, and the Universe. This JPL office ensures all six principles promulgated by the Office of Education are implemented at the center. None of the programs are carried out in an *ad hoc* manner or according to local influences.

Mr. David Seidel described the NASA Explorer School program, which supports 9 schools in Southern California, includes robotics and other JPL-unique educator workshop content, and significant family/community involvement. The strengths of JPL are emphasized. The robotics program will be adopted in schools across the country. Distance learning will be another component as the program expands. Unique teaching tools include efforts in literacy that were derived from the Cassini project. JPL has developed a matrix that matches up standards of learning and NASA topics that can help to further them.

Ms. Anita Sohus presented a brief view of JPL’s Informal Education Program, consisting primarily of the Mars Museum Visualization Alliance (about 130 museums involved at present, with plans for expansion with the advent of Cassini activity). Regional “solar system ambassadors” connect with NES, NEI, and other NASA programs and volunteer to put together public events in their own communities. There is also a Night Sky Network for sky-gazing activities at a network of observatories.

Ms. Leslie Lowe presented the Solar System Education (SSE) and Public Outreach (E/PO) forum role’s in implementing the Space Science Education program, which facilitates and enhances planetary science involvement in E/PO, provides continuity and content, and direct access to SSE and E/PO resources. He also cited JPL’s involvement in a Girl Scouts of America initiative to attract more females to science.

Dr. William Whitney presented Higher Education programs. JPL employs mentors extensively in its higher education efforts. A list of colleges and high schools were displayed, representing JPL’s relationships in 2003. The JPL staff for education has been increasing steadily from 2001 to the present. Educator stipends come from JPL funds. The Space Grant Program also provides student stipends. A 30% post-doc conversion rate was noted. JPL award fees are unique to the center. Community colleges, representing a diverse population, are also targeted in the Higher Education program, and have the chance to work with JPL mentors.

Ms. Eva Graham reviewed Minority Education Initiatives (MEI) developed to ensure attention to underserved students, focusing on outreach and recruitment. The MEI uses minority scientists and NASA scholars to help recruit students. Minorities represented were African-American, Native American, Hispanic-American, or anyone coming from minority institutions. JPL has made a special effort to approach historically black colleges and universities (HBCUs), tribal colleges (TCs), Pacific islanders, and Alaskan Native Americans. Outreach activities include Education brochures, website, and on-site recruitment. JPL also offers housing to students, considered a critical part of a successful program. Pipeline success is focused on retention through the housing provision and workshops, emphasizing personal presentation and the culture of science and engineering. The most successful approach has been to approach the principal investigators. Graduate students are expensive (\$22,000 for 10 weeks), and it is not clear that 10 weeks is long enough. Great emphasis has been given to keeping in touch with graduate students and ensuring that they are on track. The total award fee is on the order of a few million dollars, with about a tenth going to education, in addition to requests to Dr. Elachi. Dr. Kassaie averred that dispersed funding allows many possibilities.

Dr. Jenkins asked if the Girl Scout initiative included minority groups. Ms. Graham replied that GSA is refocusing to address this and attract more minority enrollment. Sororities are also a good source. Mr. Johnson highly commended the Education effort at JPL.

Division of Higher Education

Dr. Brad Weiner presented the Division of Higher Education status. The Aldridge Commission addressed the Virtual Space Academy with an emphasis on hands-on training, teacher training, and enhanced partnerships. This led to a stronger emphasis on the university community. JPL is making sure that it is addressing the Aldridge recommendations. The workforce issue also strongly drives the NASA need to attract a new cohort of bright young people to carry its vision into the future. Mr. Johnson observed that within the next 4 years, 25-30% of the NASA workforce would be eligible for retirement. The skill alignment issue is serious as well. These concerns have led to the establishment of the Science and Technology Scholarship Program (STSP). The primary features of the STSP, which include a critically important service component, were detailed. There are significant penalties for those who fail or opt out. Graduates who choose not to do service at NASA must pay back tuition money, plus interest, at a multiple of three times the amount "borrowed" (this proviso is meant to prevent students from defecting to the private sector). Dr. Jenkins remarked that this seems like an anti-NASA idea. Dr. Clay commented that the Congressionally mandated program, which has quite restrictive stipulations and potentially high monetary penalties, is not a good deal from the bright student's point of view. The high grade point average requirement may result in a student owing the government a lot of money.

Mr. Johnson observed that Congress doesn't understand the context of higher education; better opportunities exist elsewhere, such as the Gates scholarships. Students who love NASA would be the best fit. Dr. Weiner remarked that JPL already does well at attracting students from MIT and Harvard. This program has been passed by Congress: the annual funding is \$9.5M and it is not an earmark. The proposal for management of the program is on the street. The House Science Committee was responsible for some aspects of the program. One of the concerns was to get diversity in this program using the NASA Scholars Program, looking to restructure it into a competitively awarded program, and also helping to bridge the freshman/sophomore gap. It could conceivably create a larger pool to feed into the STSP. A new Cooperative Agreement notice will be out by the end of November. The Faculty Fellowship Program was the primary hit from this program, as was the USRP program, the latter of which is being phased into the Summer Internship Program.

Dr. Clay suggested that one option would be to expand similar programs around the country. Mr. Johnson remarked that the peanut butter approach is not the best approach for minority recruitment- never creates excellence at the HBCUs. Dr. Weiner disagreed, citing two programs under NASA: the University Research Centers (institutional capacity building) and the other is the Experimental Program to Stimulate Competitive Research (EPSCoR). Mr. Johnson averred that he still didn't see many successes. There was some disagreement; Dr. Jenkins felt that the statement was too blanket in nature. Dr. Harvey observed that part of the problem is political, with unequal funding. Dr. Jenkins noted that the tiers of R&D are not spoken about in equal terms. Dr. Weiner added that there is a tremendous talent base among minority students.

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Dr. Katie Blanding invited the EAC to join in Administrator O'Keefe's regular briefings in order to remain current on NASA transformation activities. Education is now part of the policy purview at the NASA Advisory Council (NAC), and asked specifically for policy guidance. Dr. Harvey noted that the EAC had not gotten an announcement to this effect. Dr. Blanding had hoped that the previous day's agenda had answered EAC's previous questions, and expressed the intent of emailing answers to pressing questions to members of the EAC. Dr. Blanding reiterated her request for agenda items on policy guidance, in order to put together an effective meeting.

NASA Advisory Council

Dr. William Harvey presented his observations from the most recent meeting of the NAC. He described his presentation as not quite a report, as there is a certain amount of fluidity to the council's existence. At the NAC, there was a significant discussion about the complexion of the changing committee. NAC is seen to cease existing under its former name, but he has not received formal notification that changes have taken place. Since many former NASA Enterprises no longer exist, the NAC has had to be reconfigured. Originally, the group convened when Education first became an Enterprise, thus meriting an advisory committee. Shortly afterwards, the President's announcement of a new Vision, thus the internal orientation of NASA was changed toward that view. From the first to the second meeting, the Aldridge report was issued, which reconfigured NASA once again, the Education Enterprise was dissolved, and Dr. Loston became Chief Education Officer within the office of the Administrator. For this third meeting, another transition point is the EAC's new emphasis on policy orientation.

Dr. Harvey requested a formal statement of this new policy orientation from Dr. Blanding. He reiterated that once again, the EAC is in a tentative placement. As EAC moves towards its next February meeting, it must clarify what each

person means by “policy.” Dr. Blanding promised to send a status report or update to each member by the end of the following week. Ms. Ramsey asked for clarification on Dr. Loston’s ideas on how EAC help promulgate policy in a unique way in order to advance Office of Education policies; do we throw ourselves in front of a moving train? There are policy issues over education programming that should be articulated and promoted. Those strategies might best be articulated by an external party, such as the EAC. Ms. Raizen added that, as outsiders, the EAC has the responsibility to see beyond the Loston agenda. The EAC sent a letter to the Administrator and has received a response from Deputy Administrator Gregory, but it has not yet received Dr. Loston’s point of view on these responses.

Dr. Harvey expressed the desire to speak to the Aldridge report’s particular findings on NASA’s ongoing involvement in educating the public on the importance of space and flight. He presumed that the Office of Education will be responsible for this, but has not received formal notification of Education’s practical response to these findings; a better sense is needed of how Dr. Loston sees herself carrying out this role. A meeting participant responded that recommendations would be folded into roadmapping activities (referring to NASA Education recommendations 8.1 and 8.2, the latter of which involves the video gaming industry). In the March 2005 timeframe, there will be a “jam session” bringing together leaders of the video game industry.

Education is also holding focus groups to engage museums, and other partners in the Education effort. Dr. Alston added that another recommendation had been to improve pre-service teaching, which the office of Higher Education is addressing. Mr. Johnson added that a group called the Learning Federation has done much work in the video game area, sponsored by Microsoft and Hewlett-Packard. Using cognitive theory and immersive learning techniques is a potential breakthrough strategy. After two years of roadmap activities, it was concluded that the National Science Foundation (NSF) has made insufficient investment (\$10M-\$15M per game) thus far, and it is time to look in federal agencies for more efforts in this area.

A participant remarked that Education is trying to sunset old programs to target this new area, and also stressed that NASA still needs to overcome its negative image. Ms. Raizen commented that in pre-service, there has been a fair amount of experience in evaluating effective teaching techniques; NASA Education should be able to build on what has worked and should engage with NSF and the Department of Education. The new emphasis on policy also muddies the water in terms of what the EAC may discuss.

Dr. Blanding noted that each NAC and EAC meeting has its minutes and asked the committee members to read these to receive a comprehensive understanding of the activities of the various Advisory Committees. Dr. Harvey felt he could not report further on the NAC meeting until clarification of Education’s function in policy could be made. Dr. Harvey hesitated to predict what the NAC will look like, but expected that every individual chair would serve out his or her term. Dr. Jenkins asked if any other committees had been assigned to policy. Dr. Harvey replied that there had been suggestions, but no determinations have been made in this regard. All committee charters are in the process of being revised.

FY05 Budget and Performance Measurement

Ms. Diane Bray presented the FY05 budget submission and the governmental bottom line, along with the impact of governmental programs on their intended audiences. The budget process is just beginning; the first step is the determination of the institutional budget (corporate and center G&A); the actual federal government budget starts in February. For the process that will begin in February, NASA will be influencing the FY07 budget. An overguide budget may be submitted, but may not be approved, and embargo rules prevent discussion of some budget items. Costs, in the past, have not been brought down to program-level detail. In addition, full-cost accounting is being put in place and fine-tuned. FY04 and FY05 program budgets have finally been elucidated in these terms. Another concept used was the color-coded performance measurements that were taken into account when developing the new budget.

Budget cycle questions were clarified. For example, FY05 budget money could begin to be spent normally on Oct 1 2004. This budget should have been approved in April 2004. The FY05 budget was planned 2 years ago, beginning in Jan 2003. The EAC cannot have input for the FY06 budget at this point in time because the FY06 budget is embargoed; the President has not approved it. Committee members felt that the EAC should have input into these budgets as early as possible. Money and policy is where the EAC can bring its expertise. Dr. Stiff added that the monies under discussion do not include mission monies dedicated to Education. Outyear numbers (to 2010) were presented, but Ms. Bray stressed that the program numbers could change as strategic changes and planning were implemented. Top lines are locked in through 2010, but breakdown numbers can change. The EAC can have influence on the FY07 numbers (which can start being spent in Oct 2006).

Dr. Rose Tseng observed that elementary and secondary education is being cut in half from 2004-2005; this doesn’t make sense. Ms. Bray responded that MUREP (Minority University Research Education Program) would absorb these funds; MUREP serves a high percentage of minority students in elementary and secondary education. Ms. Raizen asked where \$61.9M in earmarked funds would be going. Ms. Bray replied that these numbers are not monitored by

category, however they seem to be in informal education, with a small amount in elementary and secondary education. Mr. Johnson commented that the EAC needed to get its arms around the multiple sources of money, with a holistic view of how all this money is being invested. Ms. Bray explained that the earmarks are Congressionally directed; however some of the mandate can be steered toward certain educational objectives. Ms. Raizen wanted to know what the missions are spending; where is the money being spent for the pipeline? Dr. Jenkins assumed non-MUREP funds were not directed to minorities. Dr. Alston added that professional development bucket includes some minority education.

Ms. Bray described the guiding strategy of the budget development process to align the budget with Education's six Program Operating Principles, overlaying the Vision for Space Exploration, and incorporating the findings of the Aldridge Commission, framing the Education Enterprise Strategic Plan (written in 2003 and effective through 2006). Dr. Harvey asked for articulation of the six operating principles. Ms. Bray replied that the budget process is strengthening the link between performance and budget, establishing an Education Program Management Council, developing a portfolio management approach to Education programs, identifying performance measures that address outputs, outcomes and efficiency, conducting periodic program reviews and ongoing evaluations of all Education programs, and conducting monthly performance updates to the ERASMUS data reporting system, which feeds annual Performance Accounting Report (PAR) and the Program Assessment Rating Tool (PART), required by OMB. In addition, the guiding strategy stresses managing resources, formulating a responsible and credible FY05 budget, restructuring the FY05 budget (with retrofit to FY04) to allow formulation and execution at the program level, and resourcing investments that are fully aligned to the Education strategy.

Ms. Ramsey observed that the Education Office would be held accountable for all education programs, which begs the EAC to have a position on the larger role of NASA education. Informal education has 14 earmarks. In 2005, an additional list of earmarks will be received. Dr. Harvey decried the effective decrease of \$62M, and feared additional decrements. Ms. Bray admitted that earmarks are an increasing trend: in 2003, in informal education, there were \$9-10M in earmarks; in 2002, \$4M. In 2004, the numbers were \$15-16M. Dr. Harvey wanted to know the breakdown of the current earmark profile. Mr. Stofan gave as an example of an earmark targeted to a Denver museum, which in turn was able to negotiate an outreach component. In Oregon, Education has been encouraging earmarked programs to interlink back with NASA and Explorer schools. In Alaska, unsuccessful attempts have been made to get them to focus on NASA education initiatives. It is a hit or miss process.

Mr. Johnson expressed gratification in hearing there is an effort to link the Education earmark activities to the NASA strategy. Dr. Clay suggested presenting the budget differently to reflect all the resources available in supporting Education. A budget by mission, be sorted out by subject would be helpful in capturing the money by program, including the specifics of Congressional mandates. Mr. Jordan commented that in general, the earmarks have gone to informal education, possibly to elementary education, and requested a complete breakdown on education at the center. An effort is under way at the Headquarters level to provide this information. Ms. Bray added that Education dollars would not necessarily be presented as line items. Mr. Jordan felt that the centers probably concentrated on elementary and secondary education rather than higher education and professed a plan to visit NASA's Stennis Space Center to determine the truth of this supposition. Dr. Harvey requested more specific information about center budgets for Education.

Ms. Ramsey commented that the EAC is charged with evaluating all NASA education programs, not just those funded out of the Office of Education. Ms. Bray specified that her presentation covered only Office of Education funds, but all education programs are involved, as well as mission directorate and center-unique education program staff. Dr. Jenkins asked who sits on the Education Program Management Council (EPMC). Dr. Alston replied that the PMC would hopefully include centers and mission representation. Dr. Jenkins asked Ms. Bray if she could penetrate to the center level in presenting budget numbers. Ms. Bray replied that budget numbers had been requested only at the mission directorate level. Dr. Stiff remarked that if EAC is responsible for all education, it should have access to all Education data; it cannot advise in arrears.

Ms. Bray presented budget highlights, such as \$9.8M for the newly authorized S&T Scholarship Program, \$14.2M for Explorer schools, \$3.3M for the Educator-Astronaut program, \$2.8M for the Explorer Institutes program, and \$97.1M for minority university research and education to expand NASA's scientific and technical base through partnerships with HBCUs, TCUs, HSIs, and OMUs. Mr. Johnson observed that generally Education is becoming a zero-sum game. Ms. Bray agreed.

Performance Measurement

Performance measurement is a fairly new concept in the NASA budget process, comprised of a roadmap approach focused on the journey and eventually, the destination. Critical path milestones, identified in roadmaps, lead to ultimate Agency Performance Goals (APGs). Reporting is performed on a monthly (ERASMUS) and annual (PAR and PART) basis. Dr. Clay commented that he did not have a feel for the substance of the measurements, and wished to know more

because the EAC is also interested in outcomes. Ms. Bray replied that she could share APGs for 2004, and welcomed input on reviewing 2005 APGs, and offered to submit measures for the EAC's evaluation.

Dr. Clay felt the EAC might want to request new data, in addition. Ms. Raizen suggested that the EAC take advantage of evaluation data available at NSF, and that it was not necessary to re-invent the wheel. Dr. Jenkins expressed a desire to obtain details about performance measures before the next EAC meeting, and also wanted a response to Ms. Raizen's previous offering of analysis tools. Ms. Raizen remarked that she had not seen a willingness to pay for new analysis tools. Ms. Bray replied that NASA wanted first to ensure that the right tools are in place, but once established, the evaluation tools will be built into the full-cost budget cycles. Operating principles stipulate that performance measurement is an integral part of all programs, and should be institutionalized throughout the Agency with accountability placed in the Office of Education, including periodic reviews to ensure that programs are headed in the right direction. Ms. Raizen wanted to see what is actually in ERASMUS. Ms. Bray explained that ERASMUS is not tied to an online system, but will soon be integrated with the financial system; it can be retrieved, however, as PowerPoint documents.

Ms. Bray discussed program review outcomes for FY03: Seven Education programs were rated as Exemplary, 84 were rated as Good, and 13 were rated as Needs Improvement (NI). Good programs submitted Improvement Plans, and NI programs submitted Corrective Action Plans. Program Reviews for FY04 are using a more rigorous review process including some external reviewers, and is reviewing 12 programs on a 1 to 5 scale (5 = excellent, 1 = poor). The program review process for FY05-10 will drill down to the division director/office head levels and apply criteria to individual portfolios, unique to division program objectives. The Strategic Portfolio Review will look across the Agency and eliminate duplicative programs. This review will be performed by the Education Program Management Council (EPMC). The process owner will be the Office of Strategic Investments (OSS). OSS will provide support to the EPMC.

Looking to the future, NASA will create a Performance Measurement Working Group (PMWG) that will consolidate a database system, revise agency performance goals, and establish performance measures, provide training in full-cost accounting principles, COTR (Contract Officer Training) and performance measurement staff, continue collaboration with NSF and the Department of Education, continue engaging external evaluators for high-priority program evaluations, and enhance collaborative partnerships with professional associations. There is a memorandum of understanding (MOU) with NSF for evaluation assistance. Mr. Johnson commented that a curious list of universities had been chosen to perform evaluations. Dr. Alston noted that a NASA solicitation had selected the universities in a competitive federal process. The General Accounting Office (GAO) has a list of external evaluators that NASA will also consult. Ms. Raizen remarked that NSF has a good model for choosing evaluators that NASA might well consider. Dr. Tseng asked if the same measurements were applied across the competitive process. Ms. Bray replied that there would be specific measures unique to some programs, however the principles for the evaluation will remain the same. Explorer and Pathfinder programs are considered models because their evaluation tools were built in.

Discussion/closing observations

Dr. Alston asked the group to reconsider policy on budget disclosure, and ameliorate mission directorate/center trust issues, and further stated that education funds remaining in missions and centers with Education must have oversight to ensure alignment with the Aldridge Commission and the Strategic Plan. Dr. Clay suggested finding a way to diplomatically state that the Office of Education has "oversight", a word that is freighted with authoritative overtones. Dr. Harvey reiterated that the EAC must clarify what the role of Dr. Loston should be, and furthermore asked if she should have the authority to move money around. Dr. Alston requested a closer look at NPR 1000.3 to ensure that it aligns with Education goals. Mr. Johnson expressed how much he enjoyed working with the Committee. Ms. Raizen remarked that some given amount of all Education money should be invested in outcome assessment to identify which programs are strategically important. Program officers will resent it, but an agreement to this effect must be undertaken. Dr. Harvey expressed the hope that the EAC can help the Administrator understand how long-term investment in education will help the Agency reach its goals. He also mentioned Dr. Elachi's long-term mission as a prime example of long-term planning. Dr. Harvey underscored the need for specific FY05 figures. Ms. Ramsey suggested that collaborative relationships briefly touched upon in Ms. Bray's presentation should be investigated more deeply at the next meeting. A summary of action items was requested. Ms. Raizen asked to receive emails concerning documents as they become newly available (meeting minutes, NASA strategic plans, etc.).

Ms. Ramsey thanked the staff for holding up well under pressure. Dr. Jenkins thanked Dr. Alston for her comments on the critical relationship between EAC and the Office of Education. NASA is a unique Agency for promulgating the education agenda, and Dr. Jenkins hoped the EAC could help NASA meet its goals. Dr. Alston agreed that the meeting had been valuable, and predicted that interactions will improve as time goes by.

Dr. Clay observed that many requests had been embedded in the notes and wanted to ensure these are elucidated. Dr. Tseng acknowledged that quite a bit of work is entailed in meeting the EAC's requests, but better data will lead to better outcomes.

Mr. Jordan stressed that the EAC must answer Dr. Blanding's requests and help her build agendas for future meetings. There are highly qualified budget directors in every mission directorate, termed Resource Management Officers; there is also a counterpart in the mission support office. There is a dual report for the Center Finance Officers (CFOs) at the centers; they must report to HQ CFO Gwendolyn Brown Sykes until NASA has received a clean audit. Information on Explorer schools is available by state/district name; there is similar data on specific institutions in the HBCUs and the money they are receiving.

Informal discussion

The next EAC meeting is scheduled for Monday, February 28, 2005 – Tuesday, March 1, 2005. The Kennedy Space Center (KSC) will host the meeting.

Agenda suggestions

Ms. Ramsey:

- A discussion of policy related to budget, Education funding, including details about where money is being spent, line items, center funds, earmarks, and any program receiving Education dollars.
- Determination/establishment of policy and the role for the EAC in advancing that policy, and Dr. Loston's perspective on how the EAC can be helpful in supporting her Education strategy.
- Program evaluation and establishing parameters for evaluation. Subcommittee on appropriate tools for analysis and evaluation.

Ms. Raizen:

- Specific data on where and how Education dollars are being spent.
- Notification on new issues of the Strategic Plan or 1000.3, anything that spells out current policies or accountabilities for the Strategic Plan ahead of the next meeting.
- Assessments of actual outcomes.

Mr. Jordan:

- Concentrate on what the EAC can actually influence, and tackle it one piece at a time- begin with the Education and centers.

Dr. Stiff:

- If EAC is to concentrate on policy, it needs to see the whole picture. If centers are not willing to disclose their budget numbers, that is disturbing. If Administrator O'Keefe has mandated that they start thinking about detailed disclosure, the centers must respond accordingly. The EAC is not asking for presentations, just numbers that the committee can examine before the next meeting.

Dr. Blanding:

- The centers will be asked to coordinate with the Office of Education in providing specific budget details.

Dr. Harvey:

- At the earliest possible point, obtain a formal articulation of the EAC's relationship to policy and how it should focus on policy.
- What should we be looking at as a result of the NAC's changes?
- What is outside and inside the EAC bailiwick?

Dr. Jordan:

- There should be a brief discussion on the existence of the EAC; by the time the committee gets a grip on the issues, there may be a brand-new committee.
- Perhaps have a staggered term.
- Make an appointment policy so that reinvention is not necessary every time.
- What are the appointment policy and terms of commitment?

Mr. Wayne Johnson:

- Will make a presentation on the HP-Compaq model, and minority recruitment issues.

Ms. Raizen:

- Update on the status of the roadmaps and how Education is interfacing with other roadmap teams. How the roadmaps have been influenced (policy issues) by Education and vice versa. Blanding- will send documentation on it ahead of time.

Dr. Stiff:

- If Education has a set of goals it would like implemented, the EAC would like to hear it. What does Dr. Loston want to do? She must take the lead and let the EAC advise her on where she wants to go, and how she wants to carry out meeting the Aldridge recommendations.
- How does she see the roles of the missions and centers in the implementation of education? Office of Education vs. NASA at-large?

Ms. Raizen commented that NASA has the unique capability to convince the Office of Education that increasing the nation's proficiency in mathematics and sciences is a long-term proposition. The long-term mission vision can somehow be translated to Education. Ms. Raizen wanted to see long-range planning with outcomes pinned to intermediate stages (milestones) in that long-term plan. Dr. Stiff agreed and felt that the plan should resemble the NASA roadmap to Mars. Ms. Ramsey felt that an Education roadmap could set a whole new tenor on education reform that could be extraordinary. Dr. Harvey remarked that he was now getting a sense of what initial concerns the EAC has about how NASA uses current resources and how it will use future resources. Dr. Stiff recommended that staff should be present at the next meeting as resources and not necessarily as presenters. Presentations should be reserved for what is totally new (breaking news). A participant suggested that Ms. Diane Bray be present as a resource person at the next meeting for clarification of issues. Ms. Ramsey suggested that every meeting need not have the same components and that important policy meetings could be held at Headquarters. Dr. Harvey suggested that the EAC make some observations and obtain consensus at the conclusion of the next EAC meeting.

Action items:

The EAC requested specific funding details on FY05 Education dollars allocated to centers, broken down into categories including informal education, elementary and secondary education, and graduate programs, by region, and by minority representation. Impacts of earmarks were also requested. The information should be presented in an organized, aggregated layered fashion, with relationships between offices and programs clearly delineated. Members requested that budget information be made available before the next EAC meeting in February 2005

Dr. Blanding will request of Dr. Loston her view on how the EAC can address current Office of Education requirements at the next meeting, and a clarification of the goals and policy of the Education Office.

The EAC requested policy recommendations on prior disclosure of budget details to advisory committees during budget embargo periods.

Dr. Raizen requested from Dr. Elachi a resolution of an apparent discrepancy of funding allocated largely to graduate students at JPL.

Dr. Clay requested a clear statement of how NASA intends to use its resources and missions in the interest of education in general, and how the Office of Education is leveraging the available budget, its relationship to centers and universities, etc.

Dr. Jenkins expressed a desire to obtain details about performance measures before the next EAC meeting, and also wanted a response to Ms. Raizen's previous offering of analysis tools.

A formal list of appointment dates for EAC members was requested.

A brief center presentation was requested for the next EAC meeting.

Appendix A

Committee Members

William B. Harvey/American Council on Education - Chairman
Rose Tseng/University of Hawaii at Hilo
Senta Raizen/National Center for Improving Science Education
John Jordan/Mississippi Department of Education
Wayne Johnson/Hewlett Packard
Philip Clay/ MIT
Lee Stiff/NCSU
Carol Ramsey/Raytheon
Rose Tseng/University of Hawaii
Senta Raizen/National Center for Improving Education
Harriett L. Jenkins/consultant
Katie Blanding/NASA Headquarters-Executive Director
Mei Mei Peng/NASA Headquarters-Administrative Assistant

NASA Attendees

Shelly Canright/NASA
Bernice Alston/ NASA Headquarters
Sandy Brubaker/ NASA Headquarters
Diane Bray/ NASA Headquarters
Brad Weiner/ NASA Headquarters
Debbie Biggs/ NASA
Kimberly Allen/ NASA Headquarters
Shelly Canright/ NASA Headquarters
Debbie Biggs/ NASA Headquarters
Jim Stofan/ NASA Headquarters

Jet Propulsion Laboratory(JPL) Attendees

David M. Seidel/JPL
Charles Elachi/JPL
Debbie Johnson/JPL
Bill Whitney/JPL
Leslie Lowes/JPL
Anita Sohus/JPL
Parvin Kassaie/JPL
Natalie Godwin/JPL

Other Attendees

Joan Zimmermann/consultant

Appendix B

Presentations

1. *Welcome to the NASA Education Advisory Committee*; Dr. Charles Elachi
2. *A Systems Approach to Portfolio Management at NASA*; Bernard Seery, presented by Douglas Stetson
3. *To Inspire the Next Generation of Explorers... As Only NASA Can*; Dr. Adena Williams Loston, presented by Dr. Bernice Alston
4. *Education Programs at the Jet Propulsion Laboratory*, Parvin Kassaie
5. *To Inspire the Next Generation of Explorers... As Only NASA Can*; Brad Weiner, et al.
6. *Technology and Products Office*, Dr. Shelley Canright
7. *Communicating the Vision for Space Exploration*, Dwayne Brown

Other

Materials distributed

1. *A Journey to Inspire, Innovate, and Discover; Report of the President's Commission on Implementation of US Space Exploration Policy*
2. *Jet Propulsion Laboratory Package: Journey to the Planets and Beyond*

Appendix C Committee Listing

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NASA Education Advisory Committee (EAC) Meeting

*Hosted by the Jet Propulsion Laboratory (JPL)
Pasadena, CA*

October 25 - 26, 2004

Monday, October 25, 2004

9:00 AM – 9:30AM	Opening Remarks/Meeting Agenda <i>Dr. William Harvey, Chair</i>
	Administrative Announcements <i>Dr. Katie Blanding, Executive Director</i>
9:30AM – 10:30AM	Center Overview and Roadmapping Initiative <i>Dr. Charles Elachi, Director of Advanced Planning and JPL</i>
10:30AM – 1:00PM	Tour of JPL Lunch
2:15PM – 3:00PM	A Systems Approach to Portfolio Management at NASA <i>Mr. Douglas Stetson</i>
3:00PM – 3:30PM	Transforming Education, To Inspire the Next Generation of Explorers <i>Dr. Bernice Alston, Deputy Chief Education Officer</i>
3:30PM – 3:45PM	Break

3:45PM – 4:15PM

JPL's Education Program

Dr. Parvin Kassaie, Center Education Director, JPL

4:15PM– 4:45PM

Higher Education Programs

**Dr. Brad Weiner, Director, Higher Education
Division**

Tuesday, October 26, 2004

8:00AM – 9:00AM

Remarks and Report from the NASA Advisory Council (NAC)

Dr. William Harvey

9:00AM – 10:00AM

Budget Overview and Performance Measurement

Ms. Diane Bray, Acting Asst. Chief Education Officer for Strategic Investments

10:00AM – 11:00AM

Discussion and Wrap-Up

Adjourn