National Aeronautics and Space Administration

Washington, D.C.

NASA ADVISORY COUNCIL

PLANETARY SCIENCE SUBCOMMITTEE

October 13, 2011

NASA Headquarters

Washington, D.C.

Teleconference
Meeting Minutes

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Ronald Greeley, Chairman

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Jonathan Rall, Executive Secretary

October 13, 2011
Scheduled 2-4 PM

Introduction

Dr. Ronald Greeley, Chair of the Planetary Science Subcommittee (PSS), presided over the teleconference, introducing the main topic, the James Webb Space Telescope (JWST). Dr. Eric Smith, Program Scientist for JWST, was invited to address the program status.

Dr. Smith provided the latest information on JWST, which is expected to benefit both the astronomy and planetary science communities. In response to Congressional concerns over schedule and cost, an Independent Comprehensive Review Panel (ICRP) report was commissioned to examine the JWST program and revealed two main findings: technical progress on JWST was found to be satisfactory but management had some shortcomings. NASA responded accordingly, making significant management corrections according to these specific findings. The most important of these findings has led to more open communication between senior management and industry, which had been lacking heretofore, and which will remain a subject of elevated focus until the completion of the mission. The current re-plan to an October 2018 launch date is characterized by a target 80% Joint Confidence Level (JCL) for both cost and schedule, and is nearly at 90%, in fact. 2011 has been a good year for cost issues for the project. Fractionally, about one-quarter of the JWST has been spent on the ground systems. Approximately 78% of the ground system is complete. JWST is 75% "globally complete" by mass. The mirror system in particular is mature. The increase in cost associated with the JWST re-plan is $1.2B; JWST will require an additional $156 M in 2012; those funds will be coming 50% from SMD (excluding the Earth Science Division; ESD) and 50% from the Cross Agency Support lines. An additional $1B for FY13 and out is still under discussion; currently this budget information is embargoed.

Top-level JWST milestones have been met for 2011; a similar set of milestones will be set for 2012 beginning on October 14th. Since the re-plan has been completed, the program has already seen an improvement in schedule re: cryogenic testing of mirrors; all optical elements will have been through cryovac and vibrational testing by the end of this year. The program is also moving up a beryllium program element by 6-8 months, accelerating the critical design review (CDR) for the spacecraft by 4-6 months.

Planetary Science Division (PSD)

Dr. James Green presented a status of the division. PSD greatly anticipates its next launch, the Mars Science Laboratory (MSL) mission, scheduled for Nov 25th of this year, and extended an invitation to everyone on PSS to the launch. The next major science maneuver is the insertion of GRAIL A and B around the moon, around the time of the New Year. In 2012, the Dawn spacecraft will leave asteroid Vesta for Ceres, followed by the landing of the MSL rover Curiosity on Mars. Dr. Green expressed his delight about the progress of the mission.

The Curiosity rover is currently in the Jet Propulsion Laboratory (JPL) cleanroom. The Skycrane element has been mated to the spacecraft at Kennedy Space Center (KSC). Late this month, KSC will prepare the entire system for final launch.

Dr. Green addressed the PSD budget for 2012 in light of the Decadal Survey's expectations for research grants, the Discovery program, New Frontiers, the Mars Exploration Program, etc. The planetary Decadal Survey was completed late last year, and was not released until March 2011, and was thus predicated partly on an overly optimistic FY12 budget, which has yet to be passed. Currently the PSD budget shows a net decrease. Approximately $800-900M of the Decadal Survey program is not supported by the current Presidential budget. PSD is essentially at last year's funding level, despite the FY12 budget being quite healthy ($1.5B for PSD). The House and Senate subcommittees have not yet made final decisions on the NASA budget, but have issued reports. The Senate version has PSD at $1.5B, but does include additional JWST monies for FY12. After the budget is passed, PSD will execute it, in line with a variety of other Congressional instructions.

A large, strategic mission program cannot be supported under current circumstances. Budgetary constraints will mean a descope or delay of flagships such as the caching mission for Mars; NASA is working hard with the European Space Agency (ESA) to create a mission to accomplish this. ESA has put $1B on the table for a unique, long-term relationship with NASA to carry out missions for the Mars 2016 and 2018 opportunities. The budget will also affect the Discovery, New Frontiers, and Research and Analysis (R&A) program (the Decadal Survey called for increases in all of these). Planetary science is in the middle of a major revolution in the field; PSD also contributes to human exploration (Moon, asteroids, Mars), and the

monitoring of near-Earth objects (NEOs). The planetary program is also a stated priority of the present Administration. The community must keep this in mind when talking about stakeholders; the community must communicate more robustly PSD's importance to them. Planetary science is receiving national and worldwide attention via PBS, the History Channel, etc. PBS's NOVA series will have a premiere on October 19th, which will highlight an enormous number of planetary scientists. In parallel with this activity, planetary scientists must redouble their efforts and make a long-term commitment to getting the word out.

Discussion

Dr. Greeley opened the general discussion, commenting that PSD had a good message to carry to appropriate places. Dr. Craven commented that the community will have to convince Congress, the real audience for this message, of PSD's importance, and noting specifically that this was not a call to lobby. Dr. Greeley noted that the American Geophysical Union (AGU) has already commented about science budgets across the board. Concern was raised about how much SMD/PSD would be contributing to the funding of JWST. Dr. Green pointed out that Congress has yet to agree on a budget for NASA in general and JWST in particular. Asked what the worst-case scenario might be for PSD, Dr. Green observed that Congress will come up with its own allocations, based on national priorities, adding that the division has a notional idea of what the number will be. He also reminded the subcommittee that PSD is losing about 25-30% of its budget over the runout past 2012, and that NASA could still take at least a 10% cut across the board this year if the budget is not passed by November 23rd.

Dr. Feeley noted that the Senate is in the process of considering a mini-appropriations bill, which includes the NASA budget; the outcome of this exercise is unknown. A participant asked about the structure of PSD and any possible funding for planetary analog research via ESD. Dr. Green replied that research topics depend on each division's goals and charters, and evolve over time. Right now ESD is focusing on global change, etc., and not earth analogs or extremophiles. Exoplanets, however, is actually located in the Astrophysics Division (APD). Earth analog research currently resides in PSD.

Asked how far Congress reaches down into the NASA budget, Dr. Green explained that Congress will provide broad categories of expenditure guidance in areas such as education, NEO, lunar program, the international

lunar network (ILN), Discovery, and "other missions and data analysis," among many other categories. Asked what PSD might cut in response to budget availability, Dr. Green explained that PSD is currently working with OMB and the Administration to create a program that fits within the President's 2013 budget, which will reflect Decadal Survey priorities; it is all about a balanced program, which at present may only be discussed in broad terms. FY11 is $1.44B. FY12 is $1.5B, with or without JWST depending on Congress. There are still no new starts, because PSD is still operating at the FY11 level, due to the Continuing Resolution. The priorities remain focused on current programs and near-term launches. Dr. Green reiterated the point that while Congress is supporting planetary science at its highest point in years, PSS must consider the radical drop that is foreseen in the outyears and will have to adjust its expectations. The projection enables the community to plan the future; if the budget goes down in the outyears, it means that planetary science will diminish in importance. Dr. Green felt that the silence from the community regarding the Planetary Decadal Survey has been deafening. The decision-makers are not hearing the message of importance of planetary science.

Dr. Greeley directed the attention of PSS members to AGU and DPS mailings that have been stressing this point. Decision-makers need to understand that the Decadal Survey is the reflection of the planetary science philosophy. Dr. Sykes suggested that it would be helpful to Dr. Green to better reflect the damage over the next four years in the budget waterfall charts. Dr. Bottke asked if PSD would receive time on JWST in return for its investment. Dr. Green noted that there is $16M in PSD grant money for time on JWST and this time will be competed. It was noted however that JWST is limited to viewing the outer Solar System.

Dr. Green reported that he had given an April 18, 2011 PSS presentation that focused on implementing the Decadal Survey within the diminished budget atmosphere; this presentation is available on the LPI website. Asked whether JWST had considered decreased cost, descopes, or earlier launch scenarios, Dr. Smith replied that JWST has undergone numerous descoping exercises (an exercise in 2005 removed some short wavelength capabilities; last year, an exercise resulted in the removal of some testing). Because so much hardware is largely completed on JWST, further de-scoping will not save money. The main way to descope at this point is to accept what the hardware delivers.

The subcommittee discussed ramifications of JWST costs in terms of their effect on SMD, particularly in the out-years. Dr. Smith noted that $1.2B figure from FY12-16 does include reserve. $8B is the cap for the mission. JWST is expected to cost $156M per year thru fiscal 2018. FY13-16 runout budgets include the additional billion. Thus the cost is effectively $250M each year in FY13-16 (FY13 is the peak year). How these monies will be levied is still under discussion. Dr. Green reiterated that those fiscal years are very low compared to FY12, if planetary science is not treated as a priority, the numbers will be lower still. He added that PSD has created a map of the US showing where planetary R&A monies go, bolstering the argument that planetary science can be translated to job data. Dr. Greeley suggested that PSD consider doing this for all activities in the program, and not just R&A. Dr. Green agreed, citing mission activities associated with various universities that represent a good deal of involvement.

Ms. Bethany Johns asked whether out-year numbers were meaningless. Dr. Green responded that PSD bases its program on the President's priorities. Ms. Johns asked if a Mars sample return could be accomplished on a $1B/year budget runout. Dr. Green averred that this was not a realistic question, as there is no indication that PSD would have a flat budget extending outward; regardless, PSD must live within the Administration's top line budget. Ms. Johns indicated she had posted budgetary information on blog.aas.org.

Dr. Greeley mentioned uncertainties around the status of the 2016 ExoMars mission with respect to ESA, due to a recently cancelled bilateral meeting. Dr. Sanjay Limaye commented that the new national space policy promotes international collaboration, and asked whether there were any clear path on how to pursue this collaboration. Dr. Green reported having devoted an enormous effort to working with ESA as the two agencies have recognized the overlap in the goals of their respective Mars programs. NASA and ESA have created a 2016 mission based on shared costs between the agencies, and is also creating a 2018 architecture. ESA has requested a certain level of confidence from NASA, which has not yet been provided. At the last ESA bilateral, Dr. Green urged ESA to react to NASA uncertainties with vision, citing the Giotto mission, which was developed after a collapse of a NASA/ESA partnership in the 1980s. Giotto ushered in the modern era of cometary science, thus Dr. Green hoped everyone could maintain a good faith effort. NASA is really developing a series of missions with ESA, the first of which is the 2016 opportunity; the 2016 mission is a trace gas orbiter,

and the 2018 will be a rover designed to cache a sample for later retrieval. Dr. Greeley noted that PSS would be receiving a good status report at the next full meeting, which will also include a discussion of de-scopes.

PSS considered cancelling a pre-meeting teleconference due to the cancellation of the bilateral meeting in Europe. Asked about the joint science team for the 2018 Mars mission, and how firm the AO commitment was, Dr. Green reported that PSD is hanging on by the fingernails to even have an 2018 mission. Additionally, NASA and ESA are still working on the architecture, still must agree to a budget, and still must attain a passed budget. The plan is to make as many elements as competitive as possible. Dr. Green reiterated that the Mars program is in jeopardy. Dr. Greeley suggested it would be useful to pull out some talking points with graphics to illustrate this jeopardy. He also requested input from PSS members as to their top 3 concerns, to be discussed at the next full subcommittee meeting.

Dr. Greeley concluded by remarking that it up to the planetary community to build the case for the exciting planetary science that is under way. Dr. Greeley adjourned the meeting at 3:41 pm.

Attendees

Bill	Adkins	Atkins Strategies
Elizabeth	Alvarez	NOAO/KPNO
Scott	Anderson	Southwest Research Institute
Doug	Archer	JSC
Randy	Baggett	NASA MSFC
Will	Bagley	Space Dynamic Lab
Benjamin	Bass	Congressional Quarterly
Daniel	Berman	Planetary Science Institute
Michael	Bicay	NASA ARC
William	Bottke	Southwest Research Institute
Ben	Bussey	John Hopkins University Applied Physics Lab
Thomas	Calgaard	Lockheed Martin
Wendy	Calvin	University of Nevada in Reno
Julie	Castillo	JPL
Dennon	Clardy	NASA MSFC
Karla	Clark	JPL
Stephen	Clark	Space Flight Now
Anne	Connor	House Committee on Science, Space & Technology
Randall	Correll	Ball Aerospace

Ron	Cowen	Freelance Reporter
Keith	Cowing	NASAwatch.com
Tom	Cravens	University of Kansas
David	Desmarais	NASA ARC
Cynthia	Dinwiddie	Southwest Research Institute
Richard	Dissly	Ball Aerospace
Aleta	Duvall	University of CO
Kelly	Fast	NASA HQ
Walt	Faulconer	Strategic Space Solutions, LLC
Rick	Fienberg	American Astronomical Society
Michael	Flaser	NASA GSFC
Robert	Frampton	Boeing Company
Martin	Frederick	Northrop Grumman
Marc	Fries	Planetary Science Institute
Stephanie	Getty	NASA GSFC
Timothy	Glotch	Stony Brook University
John	Grant	Smithsonian
Tommy	Grav	Planetary Science Institute
Ronald	Greeley	Arizona State University
Mark	Gurwell	Center for Astrophysics
Heidi	Hammel	AURA
Candice	Hansen	Planetary Science Institute
Paul	Hayne	Caltech
Gregory	Herzog	Rutgers University
Gregory	Herzot	Rutgers University
Carl	Hibbitts	JHU Applied Physics Lab
Scott	Hovarter	Industry
Thenwei	Hu	Xneano
Dana	Hurley	JHU/APL
Brian	Hynack	University of Colorado
Bethany	Johns	American Astronomical Society
Jeff	Johnson	JHU/APL
Torrence	Johnson	JPL
Kurt	Klaus	Boeing
Tibor	Kremic	NASA
Rob	Landis	NASA WFF
Dan	Leone	Space News
Sanjay	Limaye	University of WI Madison
Rosaly	Lopes	JPL
William	Mackey	Canadian Space Agency
Stephen	Mackwell	Lunar & Planetary Institute
Jonathan	Malay	Lockheed Martin
Adam	Mann	Wired Science
John	McCarthy	Orbital Sciences
Alfred	McEwen	University of AZ
Melissa	McGrath	NASA MSFC
Nancy	McKeown	Grant Macewan University
William	McKinnon	Washington University
Scott	McLennan	Stoneybrook University
Virginia	Neale	Caltech
Curt	Niebur	NASA HQ
Conor	Nixon	University of MD
Sarah	Noble	NASA HQ
Keith	Noll	NASA GSFC

Eric	Palmer	Planetary Science Institute
Wes	Patterson	Johns Hopkins University
Yvonne	Pendleton	NASA
Steve	Price	Lockheed Martin
Louise	Prockter	APL
Jonathan	Rall	NASA HQ
Trina	Ray	The JPL
Kim	Reh	JPL
Kurt	Retherford	SWRI
Jaime	Reyes	Private Sector
Anna-Louise	Reysenbach	Portland State University
Shane	Roark	Ball Arrow Space
James	Roberts	APL
Raphael	Rosen	Sky Magazine
Steve	Ruff	Arizona State University
Nalin	Samarasinha	Planetary Science Institute
Brittney	Schmidt	University of TX
Mitch	Schulte	HQ
Teresa	Segura	Northrop Grumman
Glenn	Sellar	JPL
Kristen	Shapiro	Northrop Grumman
Charles	Shearer	University of New Mexico
Heather	Smith	ARC
Marcia	Smith	SpacePolicyOnline.com
Paul	Steffes	GA Tech
David	Stillman	Southwest Research Institute
Dawn	Sumner	UC Davis
Jessica	Sunshine	University Of MD
Mark	Sykes	Planetary Science Institute
Henry	Throop	Planetary Science Institute
Allen	Treiman	Lunar Planetary Institute
Gregg	Vane	Jet Propulsion Lab
Anne	Verbiscer	University of VA
Richard	Vondrak	NASA Goddard
Meenakshi	Wadhwa	AZ State University
Jonathan	Weinberg	Ball Aerospace
Cathy	Weitz	Planetary Science Institute
David	Williams	Arizona State University
James	Wray	GA Institute of Technology
June	Zakrajsek	NASA
Joan	Zimmermann	Zantech