

# NASA ADVISORY COUNCIL

## ASTROPHYSICS SUBCOMMITTEE

October 29, 2010

NASA Headquarters  
Washington, D.C.

Teleconference  
Meeting Minutes



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Alan Boss, Chair

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Hashima Hasan, Executive Secretary

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October 29, 2010

**Introduction**

Dr. Alan Boss, Chair of the Astrophysics Subcommittee (APS) opened the meeting, first noting the loss of APS member Dr. John Huchra, emphasizing his service to the community as well as his enormous contribution to the subcommittee and to the science of astrophysics. Dr. Jon Morse also expressed his personal appreciation for Dr. Huchra's influence and legacy.

Dr. Boss noted potential conflicts in the agenda discussion on the James Webb Space Telescope (JWST) and WFIRST, asking Drs. Heap, Polidan, and Martin to recuse themselves from the discussion when required.

**JWST Update**

Dr. Morse, Director of the Astrophysics Division (APD), gave a status report on the progress of JWST. In September 2010, the Testing Assessment Task (TAT) group report was released to evaluate the mission's testing content and schedule. The results of a Congressionally-requested Independent Comprehensive Review Panel (ICRP) are imminent, and are expected to be reported to the Administrator within days or weeks. APD is also trying to put out the WFIRST Science Definition Team (SDT) charter in a reasonable amount of time, within the time frame of the JWST reporting activities. The ICRP report is meant to be actionable for the 2011 budget. There will be an agency and stakeholder response to this report, which will also consume some time, and this may necessitate another APS teleconference before Christmas, bearing in mind that the ICRP report may or may not be out by that time. After JWST reaches an Agency PMC decision point, APD will take into consideration all technical and programmatic inputs.

Speaking to technical issues that had been raised on JWST, Dr. Geoff Yoder addressed each question in turn. Question 1 concerned the status of JWST's mass to orbit margins and project Golden Rule waivers. The project has confirmed with the European Space Agency (ESA) that the launch vehicle will provide the agreed-to performance. Margins are being tightly monitored, but they are no longer the concern they were previously. Regarding the Golden Rules waivers, most have been processed through the GSFC Engineering group, and no showstoppers have been noted. There are a few waivers that have not been closed out from a signature standpoint; Dr. Yoder agreed to address these off-line with interested APS members.

Question 2, regarding the status of an open request for action (RFA), has been fully addressed, while acknowledging that RFA outputs could overlap with some of the TAT recommendations. The project is currently meeting with the Standing Review Board (SRB) to review the situation and make final determinations.

Question 3, regarding the status of negative bond margins, dealt with the issue of traditional bond margins having not been adjusted for the effect of cryogenic temperatures. The project has worked through the process with Engineering and others to come up with a zero margin concept, wherein risk points have been identified, and necessary measurements determined. In some cases, bonds will not be able to be inspected and verified. A final approval process is under way and Dr. Yoder felt that Question 3 had been fully resolved.

**APD Update**

Dr. Morse reported that the APS recommendations had been brought forth and discussed at the September NASA Advisory Council (NAC) Science Committee meeting, and had included a review of WFIRST and ESA's planned Euclid mission. The Astronomy and Astrophysics Advisory Committee (AAAC) also addressed WFIRST/Euclid during its meeting of 7-8 October, as well as the question of a domestic re-start of Pu-238 production. The AAAC letter contained references to APS and NAC Science Committee recommendations, indicating good agreement among all three advisory bodies.

A Dear Colleague letter has been issued for the WFIRST SDT; responses are due 23 November. APD also issued a NASA Research Announcement (NRA) for Euclid Science Team participation, through a ROSES amendment. The NRA contains a caveat that NASA retains the right to defer or terminate selections, in an effort to keep all options open per previous advisory group input. There will also be a National Research Council (NRC) ad hoc panel convened to monitor the implementation of the new Decadal Survey. Dr. Morse encouraged APS members to consider listening in to the 7 November open session of the panel, which will produce a letter by mid-December, laying out options for implementing Decadal Survey recommendations.

An Explorer Announcement of Opportunity (AO) is due to be released on 1 November, and named fellowships will also be announced shortly. Stratospheric Observatory for Infrared Astronomy (SOFIA) early science flights have been delayed by a wiring issue on the jet's engine, which is currently being repaired. It is hoped that the first science flight will take place in late November; this flight is also weather-dependent. Dr. Shaul Hanany asked about Mishap Investigation Board (MIB) results on the unsuccessful 28 April launch of a scientific balloon from Alice Springs, Australia. Dr. Morse reported that the MIB wrote its report and delivered it to NASA, which is now taking steps to return to flight. The Fall balloon campaign has been cancelled, and the next campaign is planned for Antarctica in mid-December. The balloon program, based at Wallops Island, VA, is working toward resumption of flights while ensuring proper processes are being followed and technical issues are resolved. Equipment is already being shipped to Antarctica in anticipation of flight resumption. Each balloon flight location will have a return to flight (RTF) review process. Overall, prospects look fairly good. There will be a superpressure (14 MCF-class) balloon test flight, and two science payloads are being prepared to launch, following successful testing.

**WFIRST SDT draft charter**

Dr. Morse reviewed the organization and context of the WFIRST Science Definition Team (SDT). Euclid and WFIRST activities will both be assigned to Goddard Space Flight Center (GSFC) and the Jet Propulsion Laboratory (JPL). In addition, Headquarters Program Executives and Program Scientists are being assigned. The projects will span both the Physics of the Cosmos and Exoplanet Exploration offices. Efforts are under way to get organized.

There is now a WFIRST website hosted by GSFC, which will post documents of interest to the community, and will include the revised SDT charter. Dr. Morse invited subcommittee members to email their comments, to be integrated into the draft SDT charter by the week of 1 November.

The WFIRST SDT will operate within both a tight scientific and budget environment; NASA Headquarters will provide the SDT with cost and schedule constraints to help design the scale and scope of the mission. JWST continues to dominate the discussion, as more of its impact is understood; the annual budget cycle is ever-changing and will be a limiting factor. The science environment includes the Large Synoptic Survey Telescope (LSST) and other telescopes, other operating space missions as well as missions in planning, potential Explorer selections, and missions being developed by other nations/agencies.

Regarding the wording of the charter itself, Dr. Morse reviewed it section by section, inviting members to make comments for later email consultations. He briefly referenced the WFIRST mission language, which closely mirrored the Decadal Survey's (Astro2010) goals and descriptors. The SDT is intended to provide key science studies that will identify the goals and key parameters of the WFIRST mission (e.g., read noise on detectors, spectral resolution, figures of merit), as outlined by Astro2010. Dr. Morse stressed that the SDT is not charged with carrying out a technical implementation. The SDT will have to consult with the community to determine the extent of "science erosion" that takes place during large-mission planning over the long term. The SDT must try to predict where the field will be in 10 years. SDT will also produce a design reference mission (DRM), including a proof-of concept exercise that makes an accounting of the potential scientific impact of the mission, both qualitatively and quantitatively. Dr. Mary Beth Kaiser commented that it appeared much work would be needed to determine figures of merit, and asked if sufficient funding were available to support such work. Dr. Morse responded that while some travel is supported for the SDT membership, participation on the team is regarded as a voluntary contribution by the scientific community. Asked if the Euclid mission would be evaluated in the same manner as WFIRST, Dr. Morse replied that the Euclid mission is certainly part of the scientific context for the SDT; the team needs to be cognizant of the schedule and selection process for Euclid. This is a programmatic consideration that had been made in consultation with the APS and other community bodies.

Dr. Chris Martin, speaking as a member of public, asked about the timing of impending results of the NRC ad hoc panel and its potential impact upon the WFIRST SDT. Dr. Morse felt that there would be a dependence on the NRC letter, as it provides context for what WFIRST may or may not do. However, the SDT deadline had been selected to ensure that the SDT would have the maximum amount of time to do its preliminary work between January and June 2011. Dr. Hanany raised the continuing concern that WFIRST and Euclid may eventually become a merged mission between ESA and NASA, and wondered whether the SDT charter should be expanded to explore this possibility. Dr. Morse explained that if ESA selects Euclid, NASA plans to engage in a discussion of a combined mission, and is continuing to keep options open. NASA is also depending on grass roots, scientist-to-scientist discussions, to inform the process. Any merged mission would be considered through formal NASA/ESA discussions. The SDT will also produce a preliminary concept so that NASA will have enough definition to talk about what WFIRST can do vis à vis Euclid. Depending on those discussions, working groups will be formed, supported by both agencies, to work out what a combined mission could accomplish. APD is already on a path to do this, following the community recommendations.

Other members supported Dr. Hanany's assertion that the charter should include language that explores a merged mission. Dr. Morse felt that the issue belonged in the study request section. Dr. Boss commented

that if Euclid is chosen, ESA intends to send out contract requests at full speed, and expected that the SDT will have a clearer view by summer 2011. Dr. Kaiser noted that this arrangement argues against having a merged mission. Dr. Morse agreed in principle, but believed that there are other mitigating factors that will help further the discussion toward a merged mission; the SDT should keep in mind what Euclid does, and think about possible adjustments accordingly, but also must consider WFIRST in a context without Euclid. A meeting participant suggested that the SDT include experts on ground- and space-based facilities, and also commented that late 2012 seemed a late date for a final report. Dr. Morse responded that the preliminary SDT report will be driven by discussions of a potential merged mission, and that NASA plans to move forward with WFIRST as recommended, with or without Euclid. APS concurred that the charter should contain a sentence regarding the impact of Euclid on WFIRST planning; subcommittee members agreed to prepare comments to this effect.

Dr. Hanany noted that NASA should be ready to discuss a merged mission before mid-2011; and that SDT could help with this if Euclid is explicitly considered as early in the process as possible. In that context, another participant commented that the WFIRST SDT could devise a mission that is more capable than Euclid. It was also noted that exoplanet calls would be coming out soon. APS members further concurred that the SDT should develop a two-path scenario: i.e. a design reference mission (DRM) that considers the Euclid selection, and a DRM that excludes Euclid. Dr. Leisa Townsley asked how mission timing might be resolved, given Euclid would be scheduled to launch well before WFIRST. Dr. Morse felt that APS resources would not allow WFIRST to fly prior to 2022, which is the context the SDT needs to take into account. Euclid should be considered as a mission that will precede WFIRST by some years. A participant commented that perhaps some veterans of Spitzer telescope planning could inform this discussion. Dr. Morse noted that the SDT will likely contain expertise from the Spitzer community. Dr. Mary Beth Kaiser observed that Dr. Roger Blandford has continued to publicly support a more aggressive U.S. leadership role in a dark energy mission, and felt that NASA's current commitment to Euclid is insufficient. Dr. Morse noted that this issue is reflected in the AAAC letter, as well as the APS consensus on adding the merged mission scenarios.

Dr. Morse continued reviewing the charter. Non-technical members are also being sought for the SDT, particularly those who have familiarity with programmatic issues and cost constraints. Dr. Polidan suggested a more generalized statement on scientific and technical assessments and agreed to send input to Dr. Hasan. Regarding public release of information, Dr. Morse noted that NASA would prefer to have the Chair of the SDT to act as a spokesperson for the team, and that SDT members should consult with NASA and the Chair before giving personal talks related to the team's work. Within the membership language outlining areas of expertise, Dr. Steven Ritz suggested the addition of a specific sentence asking for people familiar with related ground- and space-based capabilities.

Dr. Morse reviewed the remainder of the charter; no further changes were suggested.

#### **APS discussion**

APS members engaged in a general discussion. Dr. James Rhoads asked whether the Department of Energy (DOE) would play a role in WFIRST. Dr. Morse responded that NASA has encouraged applications from DOE. When the programmatic time scale is determined, NASA will approach DOE again to see if there are common interests. DOE participation will be kept on the table. Dr. Rhoads

commented on the language at beginning of the charter, which seemed to imply that some science goals are more equal than others. Dr. Rita Sambruna explained that the text from the Charter was broken into separate bullets in the slides to ease reading by the audience, and stressed that the Charter itself reflects no prioritization of science goals whatsoever. ~~agreed to edit the goal statement as APS desired.~~

A participant commented on the large number of individual research topics, and felt that a statement focusing on the three science goals should be strengthened; he also commented on addressing the balance between the ground- and space-based aspects of WFIRST. Dr. Morse, asked about the issue of international membership, emphasized that the call is wide open to ESA members, and ESA member selection would be followed up by formal NASA/ESA discussions.

**Public comment period**

No comments were noted.

**Wrap-up**

Dr. Boss concluded with a statement that APS supports the WFIRST SDT charter, with some minor amendments. Comments for such amendments were requested by COB 1 November. APS considered the possibility of another teleconference before Christmas, and a face-to-face meeting in mid-February 2011. Dr. Boss adjourned the meeting at 2:50 PM.

## Appendix A Attendees

### Committee Members

Alan Boss	CIW, Chair Astrophysics Subcommittee
Kathryn Flanagan	STScI
Shaul Hanany	University of Minnesota
Mary E. Kaiser	John Hopkins University
James Kasting	Penn State
James Manning	Astronomical Society of the Pacific
Chris Martin	Caltech
Ronald Polidan	Northrop Grumman
Leisa Townsley	Penn State University
Hashima Hasan	NASA Headquarters, Exec. Secy., APS
James Rhoads	Arizona State University

### NASA Headquarters Attendees

W. Vernon Jones	NASA Headquarters
Lia LaPiana	NASA Headquarters
Trent Perrotto	NASA Headquarters
Eric Smith	NASA Headquarters
Ray Taylor	NASA Headquarters
Jon Morse	NASA Headquarters, Astrophysics Division Director)
Michael R. Moore	NASA Headquarters
Rita Sambruna	NASA Headquarters
John Gagosian	NASA Headquarters
Geoff Yoder	NASA Headquarters

### Webex Meeting Attendees

Lou Allamandola	ARC
Michael Bacay	ARC
Jean Beaulieu	IAP
David Bennett	Univ. of Notre Dame
Blake Bullock	Northrop Grumman
Chris Burrows	Burrows Consulting
Dominick Conte	Orbital Sciences
William Danchi	NASA Headquarters
Holly Degn	NASA Headquarters
Susana Deustua	STScI
Arjun Dey	NOAO
D. Elmegreen	Board of Astronomy
Jens Feeley	NASA HQ
Jonathan Gardner	NASA GSFC
Neil Gehrels	NASA GSFC

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Kevin Grady	NASA GSFC
M. Greenhouse	NASA GSC
Richard Griffiths	NASA Headquarters
Ilana Harrus	NASA Headquarters
Stephen Holland	NASA
John Hughes	Rutgers University
Clifton Jackson	NASA GSFC
Bethany Johns	AAS
Deirdre Jurand	NASA SMD
Vicky Kalogera	Northwestern University
Amy Klamper	Space News
Caryn Knutsen	NAS
C. Kouveliotou	MSFC
Jeffrey Kruk	NASA GSFC
David Lang	NAS
David Leisawitz	NASA GSFC
Dan Lester	University of Texas
Marie Levine	NASA JPL
Michael Levy	LBL
John Mather	NASA GSFC
Gary Melnick	Harvard Smithsonian
Michael Moloney	NAS
Warren Moos	Johns Hopkins Univ.
Marian Norris	NASA Headquarters
Richard Panek	Physics World
Jeff Puschell	Raytheon
Fun-Hong Rhie	Univ. of Notre Dame
Adam Riess	John Hopkins University
Steven Ritz	USFC
Wilton Sanders	NASA Headquarters
Donald Shapero	NAS
Robert Smith	Univ. of Alberta
Connie Spittler	Northrop Grumman
Sumi Takahiro	Nagoya University
Kathy Turner	US Dept. of Energy
Stephen Unwin	NASA JPL
Gillian Wilson	Univ. of CA Riverside
J. Zimmermann	Contractor

## Appendix B Membership

### NAC Astrophysics Subcommittee Membership

**Alan Boss, Chair**

Department of Terrestrial Magnetism  
Carnegie Institution for Science  
Washington, D.C.

Kathryn Flanagan  
Space Telescope Science Institute

Shaul Hanany  
University of Minnesota/Twin Cities

Hashima Hasan  
NASA Headquarters  
Science Mission Directorate  
Astrophysics Division Exec. Secretary

John (Jack) P. Hughes  
Rutgers University

Mary E. Kaiser  
Johns Hopkins University

James F. Kasting  
Pennsylvania State University

James G. Manning  
Astronomical Society of the Pacific

Chris Martin  
California Institute of Technology

Ronald S. Polidan  
Northrop Grumman Space Technology  
Civil Systems Division

James E. Rhoads  
Arizona State University  
School of Earth and Space Exploration

Leisa Townsley  
Pennsylvania State University

Appendix C  
Agenda

<b>Agenda</b>		
<b>Astrophysics Subcommittee</b>		
<b>October 29, 2010</b>		
<b>Via telecon/webex</b>		
<b>Friday 29 October</b>		
1:00 p.m.	Introduction and Announcements	Alan Boss
1:05 p.m.	JWST Update	Geoff Yoder/John Casani
1:50 p.m.	Discussion	
2:00 p.m.	Review of WFIRST Science Definition Team Draft Charter	Jon Morse
2:30 p.m.	Discussion	
2:50 p.m.	Public Comment Period	
2:55 p.m.	Recommendations, Actions	Alan Boss
3:00 p.m.	Adjourn	