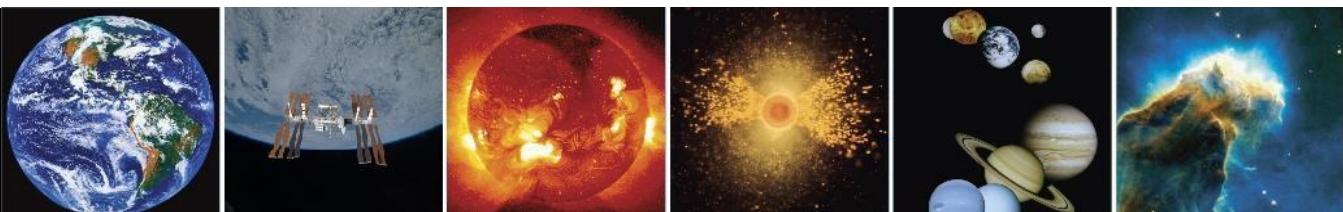


SPACE STUDIES BOARD NEWS



JANUARY – MARCH 2014

INSIDE THIS ISSUE



"I am happy about the optimistic and confident NASA that I have seen emerge in recent months. Part of it is that NASA has a budget for a change. Not that it is perfect, but it does the job and NASA can plan, knowing they have the confidence of the Congress and Administration. "

—SSB Chair Charles F. Kennel

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NATIONAL ACADEMY OF SCIENCES

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SPACE STUDIES BOARD NEWS



FROM THE CHAIR



I chaired my last Space Studies Board (SSB) meeting on April 3 and 4, and attended my last meeting as an *ex officio* member of the NASA Advisory Council (NAC) on April 16 and 17. These were wistful moments for me. I had served on the NAC from 1998 to 2006, chairing it between 2001-2005; after 2006, there was a two-year hiatus, during which I co-chaired the NRC's Beyond Einstein Program Advisory Committee (BEPAC), and then my NAC membership resumed with my SSB appointment in 2008. I had also served on the review of U.S. Human Space Flight Plans Committee (the so-called Augustine commission) in 2009. So you can see much of my later life has been bound up with volunteer work providing advice to the U.S. Space Program.

It is certainly well past time that NASA and the NRC heard from somebody new about the space sciences. But I cannot help but think back. I wake up some nights thinking of mistakes I may have made, opportunities I did not see, of colleagues I underestimated, of contributions I did not acknowledge. I will never be an objective judge of my sins of omission and commission; others will have to make that judgment. Nor can I be an objective judge of the accomplishments of the SSB on my watch. Others will have to make that judgment, too. I can be a reliable witness only to what I am thinking about at this very moment, this fleeting instant of time.

I can tell you what I am happy about.

I am happy about the optimistic and confident NASA that I have seen emerge in recent months. Part of it is that NASA has a budget for a change. Not that it is perfect, but it does the job and NASA can plan, knowing they have the confidence of the Congress and Administration.

I am happy about how NASA, led by Bill Gerstenmeier (Associate Administrator for Human Exploration and Operations), is conceptualizing its human spaceflight future, laying out a building-block approach to landing humans on Mars sometime in the future. If we are willing to wait and overcome challenges one by one, it need not require a huge infusion of new resources. For the first time, I begin to believe that it might actually be possible.

Having served on the Augustine commission, I am happy that NASA's decision to support new entrepreneurial space launch companies seems to be bearing fruit.

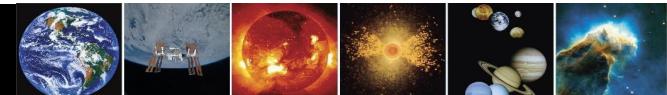
I am happy about the explosion of exciting results on extrasolar planetary systems, and all the implications for how we humans view our existence. I am happy that astrobiology is recovering from its budget cuts of a few years past. I am happy that I was at JPL when *Curiosity*, the Mars Science Laboratory, made its daring landing; SSB's executive committee met there right afterwards. I am happy to know there is abundant evidence that water has played a significant role in shaping the martian environment and that the Moon is not as dry as we previously believed. I am happy that NASA's heliospheric physics program has developed so much maturity and competence in its observations and models that it is supporting the creation of a practical national space weather program. I am happy that NASA Earth observations continue to provide more and better observations about the Earth system than the rest of the world combined, as it has since the days of the Earth observing system in the mid-1990s. I am happy that there have emerged no more major problems with the development of the James Webb Space Telescope. I am happy that NASA seems to be finding a way to accomplish the goals for dark energy space research that were set forth in the SSB's decadal survey for astronomy and astrophysics.

I am happy with the Space Studies Board.

I am happy that the SSB's decadal surveys remain one of the finest examples of rigorous scientific planning anywhere. I am happy that SSB's 2012 "lessons learned" workshop stimulated so much deep thought about the next round of surveys.

I am happy with how the SSB and the NRC Board on Physics and Astronomy collaborate to sponsor the Committee on Astronomy and Astrophysics, which surveys both space-based and ground-based programs. I am happy that SSB reconstituted all its standing committees after some of them had stood down during the writing of the most recent set of decadal surveys that took place on my watch. I am happy that the SSB worked with NASA and NRC leadership to furnish our standing committees the flexibility to build the

(Continued on page 3)



SSB MEMBERSHIP

JULY 1, 2013—JUNE 30, 2014

CHARLES F. KENNEL, *CHAIR*

Scripps Institution of Oceanography,
University of California, San Diego

JOHN KLINEBERG, *VICE CHAIR*

former CEO of Swales Aerospace

MARK R. ABBOTT

Oregon State University

JAMES ANDERSON

Harvard University

JAMES BAGIAN

University of Michigan

THOMAS R. GAVIN

Jet Propulsion Laboratory

NEIL GEHRELS

NASA Goddard Space Flight Center

SARAH GIBSON

National Center for Atmospheric Research

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Jet Propulsion Laboratory, California Institute of Technology

SAUL PERLMUTTER

Lawrence Berkeley National Laboratory

MARCI A. RIEKE

University of Arizona

DAVID N. SPERGEL

Princeton University

MEENAKSHI WADHWA

Arizona State University

CLIFFORD M. WILL

University of Florida

THOMAS H. ZURBUCHEN

University of Michigan

LIAISON

LENNARD A. FISK

U.S. REPRESENTATIVE TO COSPAR

(Continued from page 2)

organic relationship with NASA's program offices that I had long dreamt of.

I am happy with the two NRC Space Science Weeks the SSB and BPA has sponsored thus far, when our standing committees met together in parallel and joint sessions. I am happy to have participated in their discussions. I am happy with the idea that the NAC's science committee might join us during Space Science Week next year.

I am happy with the SSB's partnership with the Aeronautics and Space Engineering Board (ASEB). I am happy with my relationship with its chair, the great General Lester Lyles. I am happy that our two boards will co-sponsor a new standing committee on biological and physical sciences in space. I am happy that NASA's Human Exploration and Operations Mission Directorate supports the new committee. I am happy that our two boards did much of the thinking behind the design of the Committee on Human Spaceflight. Its report will be released soon, and I believe it may well prove to be the most influential one that will have been completed during my time with the SSB.

I am happy with the support the NRC leadership has given the SSB, from working with SSB and NASA to redesign our standing committees, to supporting, with private National Academies funds, our forthcoming Forum for New Leaders in Space Science, joint with the Chinese Academy of Sciences.

I am extremely happy with the SSB's staff. Each is an expert in the policy of his or her field. In fact I believe that the SSB and ASEB jointly are now the most knowledgeable independent group providing advice about America's civil space program. The staff holds it all together. They are the SSB's institutional memory.

I am exceptionally happy with the creative way Michael Moloney has led that staff. I am happy to have seen him evolve into a policy leader in his own right—with NASA and within the NRC.

Most of all, I am happy with the NRC's choice of David Spergel as my successor. He is a world-class theoretical astrophysicist with fine organizational instincts and great energy.

I am happy David will be writing the next Chair's Column.

One thing makes me unhappy: the thought of not seeing so frequently the extraordinary individuals who serve on the Space Studies Board.

*Charles F. Kennel
Chair, SSB*

The views expressed here do not necessarily reflect those of the SSB or the National Research Council.



SSB ACTIVITIES

THE BOARD AND ITS STANDING COMMITTEES

The Space Studies Board (SSB) did not meet during the first quarter of 2014 but did meet April 3-4. April 3 was a joint session with the Aeronautics and Space Engineering Board (ASEB) where both boards participated in a roundtable discussion with the NASA chiefs (David Miller, NASA Chief Technologist; Ralph Roe, NASA Chief Engineer; and Ellen Stofan, NASA Chief Scientist), followed by an update from and discussion with NASA Administrator Charles Bolden. The boards then participated in a discussion with representatives from the White House, Grace Hu and Paul Shawcross from the Office of Management and Budget and Richard Dalbello from the Office of Science and Technology Policy. The boards then received an update on the activities of NASA's Human Explorations and Operations Mission Directorate (HEOMD) and held a discussion with William Gerstenmaier, Associate Administrator of HEOMD. On April 4 the SSB heard updates from the leadership of the four standing committees in their purview, the Committee on Astronomy and Astrophysics, the Committee on Astrobiology and Planetary Sciences, the Committee on Earth Science and Applications from Space, and the Committee on Solar and Space Physics. The board was updated on the activities of the European Space Sciences Committee (ESSC) by Jean Pierre Swings (current ESSC Chair) and Athena Coustenis (Chair-elect) and on the activities of COSPAR by the US COSPAR Representative Len Fisk. The board also received updates from and participated in a roundtable discussion with John Grunsfeld, Associate Administrator of the Science Mission Directorate (SMD) and the SMD division directors or their representatives. Finally, the board received an update from and participated in a discussion with Kathryn Sullivan, Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator on NOAA's Earth observation and space weather programs. Visit www.nas.edu/sss to stay up to date on board, workshop, and study committee meetings and developments.



NASA Administrator, Charles Bolden presenting to the joint session of the Space Studies Board and Aeronautics and Engineering Board. Photo courtesy of Dwayne Day.

The NRC Space Science Week (www.nationalacademies.org/spacescienceweek) was held March 3-5, 2014 in Washington, DC. All four of the SSB's active standing committees met in parallel (see descriptions of the individual standing committee meetings below). On the afternoon of March 3 the standing committees conducted a plenary session at which there was a keynote presentation on the "current state of play at SMD" by John Grunsfeld, Associate Administrator for the NASA Science Mission Directorate and a session on the "views from Congress" by Tom Hammill and Pamela Whitney from the House Science, Space and Technology Committee. The day culminated with a focus session on international planning in space science which was moderated by Charles Kennel (SSB Chair) and included a panel discussion with John Grunsfeld (NASA), Alvaro Giménez (European Space Agency), Wu Ji (Chinese Academy of Sciences), and Saku Tsuneta (Japan aerospace Exploration Agency) and incoming SSB chair David Spergel.

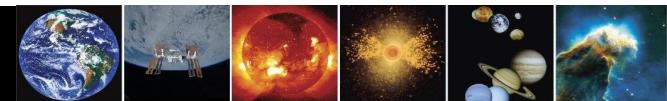
To view the NRC Space Science Week public lecture by Sara Seager, *Exoplanets and the Real Search for Alien Life*, please visit sites.nationalacademies.org/SSB/SSB_086846.



International panel during the NRC Space Science Week plenary session. Charles Kennel, David Spergel, Alvaro Giménez, Saku Tsuneta, John Grunsfeld, and Wu Ji. Photo courtesy of David Smith.

The Committee on Astronomy and Astrophysics (CAA) met on March 3-5, 2014 in Washington, DC, as part of the 2nd NRC Space Science Week. The CAA received briefings from and held discussion with Jim Ulvestad on NSF's Division of Astronomical Sciences; Kathy Turner on the Department of Energy's High Energy Program; George Ricker (MIT) on the Transiting Exoplanet Survey Satellite (TESS); Eric Smith (NASA) on the James Webb Space Telescope; Paul Hertz on the NASA Astrophysics Division; Neil Gehrels and Kevin Grady (NASA) on the interim report of the Science Definition Team for the WFIRST-AFTA mission; Karl Stapelfeldt (NASA) on the EXO-C coronagraph mission science definition team interim report; and Sara Seager (MIT) on the EXO-S mission science definition team interim report.

Prior to its Space Science Week meeting, the committee also held a telecon with Paul Hertz, Director of NASA's Astrophysics Division, on February 11, 2014, to discuss the status of the Explorer [mission class] program. The committee is currently planning its Fall 2014 meeting, to be held in Irvine, CA. For more information about CAA, to learn about upcoming meetings, and down-



(Continued from page 4)

load presentations from past meetings, please visit sites.nationalacademies.org/BPA/BPA_048755.

Dr. Betsy Cantwell (Lawrence Livermore National Laboratory) and Dr. Rob Ferl (University of Florida) have been appointed as co-chairs to the **Committee on Biological and Physical Sciences in Space (CBPSS)**, a new standing committee of the SSB and the ASEB. The co-chairs are currently participating in the work of identifying candidates for appointment to the committee. The overarching purpose of the new committee is to support scientific progress in space research in the biological, medical, and physical sciences and assist the federal government in integrating and planning programs in these fields. CBPSS is expected to provide an independent, authoritative forum for identifying and discussing issues in space life and physical sciences between the research community, the federal government, and the interested public. CBPSS will also monitor the progress in implementation of the recommendations of the decadal survey, *Recapturing a Future for Space Exploration: Life and Physical Sciences Research for a New Era*.

The **Committee on Earth Science and Applications from Space (CESAS)** met on March 3-5, 2014 in Washington, DC, as part of the NRC Space Science Week. This meeting, like the one in October 2013, had a particular focus on planning for the second NRC decadal survey in Earth science and applications from space, which will get underway in early 2015. In addition to joint plenary sessions with the other SSB standing committees, the committee received agency updates from NOAA (Marvin LeBlanc, Director, Systems Engineering, NOAA NESDIS); USGS (Sarah Ryker, Deputy Associate Director, USGS-Climate and Land Use Change); and NASA (Michael Freilich, Director of the Earth Science Division). The committee was also briefed on the European Earth science planning process (Maurice Borgeaud, European Space Agency; and Ian Brown, Member, European Space Sciences Committee) and held a roundtable discussion with Grace Hu, NOAA examiner at OMB, which focused on how the Executive Office of the President uses the decadal surveys. Representatives from the NRC's Board on Atmospheric Sciences and Climate and Ocean Sciences Board were also present throughout the meeting.

In a session entitled, "Towards a Statement of Task for the Next Decadal Survey," the committee engaged all participants in discussions on the following topics:

- Survey objectives and scope;
- How to better tailor the next survey to the different needs and missions of relevant stakeholder agencies (NASA, NOAA, and USGS);
- Status of the previous decadal survey recommendations and role in the next survey;

- Striking the right balance between prioritizing "science" and prioritizing missions;
- Role and scope of the cost and technical evaluation (CATE) process in the next decadal survey;
- Incorporating the work of the NRC "Continuity" study;
- Coordinating with international partners;
- Developing meaningful and actionable decision rules; and
- How to engage the community while managing expectations

Attendance at the meeting was disrupted by a major snow-storm that closed area airports starting on March 2. An additional meeting of the committee has been scheduled for June 3-4, 2014, in Irvine, CA to enable the committee to complete its most pressing task: the development of a statement of task for the next decadal survey that will subsequently be circulated for review and comment by potential sponsoring agencies. This meeting will be closed to the public; the next open meeting of the committee is scheduled for September 17-19, 2014, in Washington, DC. For more information about CESAS please visit sites.nationalacademies.org/SSB/SSB_066587.



Einstein statue covered in snow at the National Academy of Sciences Building on the first day of Space Science Week, March 3, 2014. Photo courtesy of David Smith.

The **Committee on Astrobiology and Planetary Science (CAPS)** met on March 3-5 as part of the NRC Space Science Week. The committee welcomed three new members to its ranks: Ronald Breaker (Yale University), Norman Pace (University of Colorado), and Mark Saunders (NASA Langley Research Center, retired). One additional appointment is expected in the near future. The committee heard detailed updates on the activities of NASA's Planetary Science Division, with particular attention paid to Research and Analysis and Astrobiology programs. In addition, the committee was briefed on the current state of development of the Mars 2020 rover mission and

the status of planning for a future Europa mission. In addition, the committee heard science presentations on the RNA world and the reported discovery of plumes emanating from Europa's southern polar region. The committee held extensive discussions of the current status of planetary science and astrobiology activities within NASA with particular emphasis on the consistency between these activities and those recommended in the most recent planetary science decadal survey and related NRC reports. These discussions led to the drafting of summary notes by the committee's co-chairs for presentation at the April meeting of the SSB. The committee's second and final scheduled meeting of 2014 will take place at the National Academies' Beckman Center in Irvine, CA, on September 3-4. In the interim, the committee plans to hold a series of semi-regular conference calls to stay abreast of new developments. More information about CAPS is available at sites.nationalacademies.org/SSB/SSB_067577.

The **Committee on Solar and Space Physics (CSSP)** met on March 3-5, 2014, in Washington, DC, as part of the NRC Space Science Week. During the meeting, the committee received agen-



(Continued from page 5)

cy updates from the head of NASA's Heliophysics Division, David Chenette, and from Richard Behnke, Geospace Section Head, NSF. Committee member and mission principal investigator Thomas Immel gave a talk about the Ionospheric Connection Explorer (ICON), which was selected in 2013 to be the next Heliophysics Explorer satellite mission. Additional topics of discussion included the potential closing of the High Frequency Active Auroral Research Program (HAARP) facility in Alaska and the implications of low proposal selection rates at both NASA and NSF. The utility of the HAARP facility in support of ionosphere-thermosphere-mesosphere research was the subject of a recent NRC-sponsored workshop (www.nap.edu/openbook.php?record_id=18620).

The committee held two focus sessions related to space weather. In one, the committee examined the current state of space weather research and operational needs; included in that session was a presentation by Ron Turner, ANSER Co. The other session featured a roundtable discussion on space weather that was held with representatives from NASA, NSF, NOAA, and USGS; they discussed the upcoming National Space Weather Program's implementation plan and how the CSSP and the NRC might best give input.

The committee held a follow-up teleconference on March 17, 2014, with David Chenette to discuss details of the President's proposed budget for Heliophysics. For more information about CSSP and to learn about upcoming meetings, please visit sites.nationalacademies.org/SSB/ssb_052324.

STUDY COMMITTEES

The ad hoc **Committee for an Assessment of the Astrophysics Focused Telescope Assets (AFTA) Mission Concepts** held its first and only in-person meeting January 12-14, 2014, in Washington, DC. The study was requested by NASA Science Mission Directorate (SMD) in order to "assess whether NASA's proposed Astrophysics Focused Telescope Assets (AFTA) design reference mission described in the April 30, 2013, report of the AFTA Science Definition Team (SDT), WFIRST-2.4, is responsive to the overall strategy to pursue the science objectives of New Worlds, New Horizons in Astronomy and Astrophysics (NWNH), and, in particular, the survey's top-ranked, large-scale, space-based priority: the Wide Field Infrared Survey Telescope (WFIRST)."

At the meeting, committee members heard from NASA SMD and the Astrophysics Division; representatives of the WFIRST-AFTA science definition team; representatives of the NASA-led WFIRST-AFTA project team; representatives of Aerospace Corporation, who conducted a technical evaluation of the WFIRST-AFTA concept; and representatives of the astronomy and astrophysics community, who spoke about the proposed coronagraph, its scientific capabilities, and associated technical risk.

The final report was released on March 18, 2014. The report concluded that the AFTA hardware could potentially be used to implement the WFIRST mission with a larger mirror, offering the potential of substantially greater scientific return for the mission than was originally proposed in NWNH. A larger mirror would also

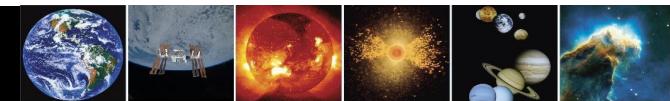
enable the inclusion of a coronagraph, which has the potential to advance NWNH objectives for technology development toward a future Earth-like exoplanet imaging mission. However, using AFTA to implement WFIRST (WFIRST/ AFTA) comes with increased cost and technical risks—particularly if the coronagraph is also included in the mission—which is at odds with the programmatic rationale in NWNH for recommending the comparatively lower-risk baseline WFIRST mission.

To read the report-in-brief, please visit sites.nationalacademies.org/xpedio/groups/depssite/documents/webpage/deps_087327.pdf. To download the full report for free, please visit www.nap.edu/catalog.php?record_id=18712.

The ad hoc **Committee on a Framework for Analyzing the Needs for Continuity of NASA-Sustained Remote Sensing Observations of the Earth from Space** held its second in-person meeting on January 29-31, 2014, in Washington, DC. The public sessions of the meeting included presentations on essential climate variables (Adrian Simmons, President/Chairman, Global Climate Observing System (GCOS) Steering Committee); JAXA's (Japan Aerospace Exploration Agency) perspectives on continuity in Earth remote sensing (Toshiyoshi Kimura, Associate Director for Engineering, Earth Observation Research Center, Satellite Applications Mission Directorate); climate modeling & data continuity (Duane Waliser, Chief Scientist, Earth Science and Technology Directorate, JPL); and the Canadian Space Agency's perspective on continuity (Thomas Piekutowski, Program Manager, Sun-Earth System Sciences and Stella Melo, Senior Program Scientist). In closed sessions, the committee worked on its task statement (available at sites.nationalacademies.org/SSB/CurrentProjects/SSB_084713). The next meeting of the committee will take place in Irvine, California on April 23-25, 2014. Additional information about the committee and its work is available at sites.nationalacademies.org/SSB/CurrentProjects/SSB_084713.

The ad hoc **Committee on Human Spaceflight** and its supporting panels completed a draft report and submitted it to external peer review in March 2014. The committee is awaiting final comments and plans to address those in preparation for an expected early summer release of the report in pre-publication form. Detailed information on this congressionally requested study, including membership and meetings, is available at www.nationalacademies.org/humanspaceflight.

With funding from the National Science Foundation the NRC has begun a study that will recommend **A Strategy to Optimize the U.S. Optical/Infrared System in the Era of the Large Synoptic Survey Telescope**. The statement of task to this committee is given here: "In order to position the observational, instrumentation, data management, and support capabilities of the U.S. optical and infrared astronomy (O/IR) system to best address the science objectives identified in the 2010 report entitled *New Worlds, New Horizons in Astronomy and Astrophysics and Vision and Voyages for Planetary Sciences in the Decade 2013-2022* and to help achieve the best science return from the National Science Foundation investment in O/IR astronomy over the next 10-15 years,



(Continued from page 6)

the National Research Council will convene a committee to write a short report that will recommend and prioritize adjustments to the U.S. ground-based O/IR system that will better position the system to address the New Worlds, New Horizons science objectives over the next 10-15 years. The committee will consider needs and strategies for several interrelated components of the system: existing and planned focal plane instrumentation; focal plane instrumentation and technology development; and data management, processing, mining, and archiving. The committee may make recommendations or offer comments on organizational structure, program balance, and funding, with discussion of the evidentiary bases, as appropriate.” The committee will be appointed soon, and its first meeting will follow. The committee will hold a town hall at the June 2014 meeting of the American Astronomical Society in Boston, MA, to engage the community in a discussion of issues relevant to the study. The town hall is scheduled for Wednesday, June 4, at 12:45 p.m.

OTHER ACTIVITIES

OUTREACH

In conjunction with the Board on Physics and Astronomy, the SSB was represented at an exhibit booth at the American Astronomical Society in Washington, DC, on January 5-9, 2014. The AAS conference was attended by more than 3,000 professional astronomers, educators, journalists, and guests. The SSB also participated in conjunction with the NRC’s Communications Office in providing literature for the American Association for the Advancement of Science (AAAS) conference held in February 2014 in Chicago. At the AAAS conference, more than 5,000 scientists, engineers, educators, and policymakers attended symposia and interacted with hundreds of members from national and international media.

U.S PARTICIPATION IN COSPAR 2014 IN MOSCOW, RUSSIA

The SSB is the U.S. National Committee for the International Council for Science’s Committee (ICSU) on Space Research (COSPAR). COSPAR was established at the height of the Cold War to act as a bridge between space scientists on both sides of the East-West divide. For most, if not all, of its 50-plus years of existence, COSPAR has striven to conduct its activities in accordance with ICSU’s Principle of Universality of Science: “the free and responsible practice of science is fundamental to scientific advancement and human and environmental well-being. Such practice, in all its aspects, requires freedom of movement, association, expression and communication for scientists, as well as equitable access to data, information, and other resources for research.”

Following recent events in Ukraine, at its recent April 2014 meeting, SSB members sought clarity and reassurance from the NASA Administrator that developments in U.S.-Russia diplomatic relations would not impede participation by U.S. scientists—including those at NASA centers or being supported under NASA grants—in COSPAR’s 40th Scientific Assembly in Moscow

this summer.

As described in a memo published on COSPAR’s website <cosparhq.cnes.fr/content/us-participation-40th-cospar-scientific-assembly>, follow-up actions by former SSB Chair Len Fisk—currently the U.S. representative to COSPAR—have resulted in clear guidance from NASA, in the form of an internal NASA memo granting approval for NASA participation in COSPAR 2014. The SSB has been informed that all associated NASA travel to Russia for the conference, as well as teleconferences and videoconferences for purposes of planning COSPAR sessions and related meetings are allowed. In addition a second memo on COSPAR’s website, the COSPAR President Giovanni Bignami notes that “thanks to the prompt intervention of our US National Representative, Professor Len Fisk, NASA was also able to announce that restrictions would not apply to COSPAR activities, and in particular to travel to the Moscow COSPAR Assembly. This came of course as a great relief to all of us and in particular to the Assembly organizers.”

NRC SPACE SCIENCE WEEK 2015

NRC Space Science Week 2015 is scheduled for **March 31-April 2, 2015**. All five of the SSB standing committees (shown below) will be meeting. This will be the first year that the Committee on Biological and Physical Sciences in Space will be joining (the first meeting of the CBPSS is expected to occur in the summer of 2014).

SSB STANDING COMMITTEES

Committee on Astronomy and Astrophysics (CAA) (joint with the Board on Physics and Astronomy)

Paul L. Schechter, MIT (Co-Chair)
David N. Spergel, Princeton University (Co-Chair)

Committee on Astrobiology and Planetary Science (CAPS)

Philip R. Christensen, Arizona State University (Co-Chair)
J. Gregory Ferry, Pennsylvania State University (Co-Chair)

Committee on Biological and Physical Sciences in Space (CBPSS) (joint with the Aeronautics and Space Engineering Board)

Elizabeth Cantwell, Lawrence Livermore National Laboratory (Co-Chair)
Robert J. Ferl, University of Florida (Co-Chair)

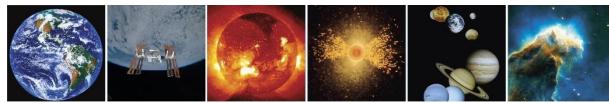
Committee on Earth Science and Applications from Space (CESAS)

Mark R. Abbott, Oregon State University (Chair)
Joyce E. Penner, University of Michigan (Vice Chair)

Committee on Solar and Space Physics (CSSP)

J. Todd Hoeksema, Stanford University (Co-Chair)
Mary K. Hudson, Dartmouth College (Co-Chair)

For more information, go to <http://sites.nationalacademies.org/SSB/ssb_052296>



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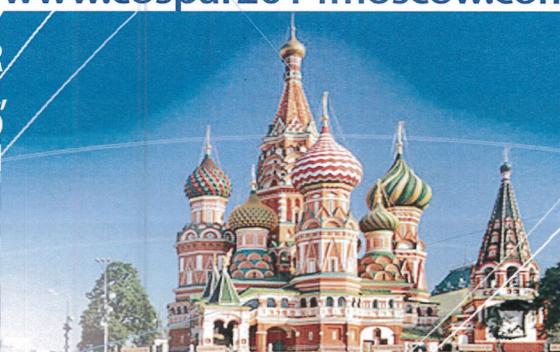
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Abstract submission deadline:
14 February 2014



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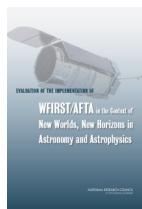
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on Space
Research



NEW RELEASES



Evaluation of the Implementation of WFIRST/AFTA in the Context of New Worlds, New Horizons in Astronomy and Astrophysics

Evaluation of the Implementation of WFIRST in the Context of New Worlds, New Horizons in Astronomy and Astrophysics assesses whether the proposed Astrophysics Focused Telescope Assets (AFTA) design reference mission described in the April 30, 2013 report of the AFTA Science Definition Team (SDT), WFIRST-2.4, is responsive to the overall strategy to pursue the science objectives of *New Worlds, New Horizons in Astronomy and Astrophysics*, and in particular, the survey's top ranked, large-scale, space-based priority: the Wide Field Infrared Survey Telescope (WFIRST). This report considers the versions of WFIRST-2.4 with and without the coronagraph, as described in the AFTA SDT report. The report compares the WFIRST mission described in *New Worlds, New Horizons* (NWNH) to the AFTA SDT WFIRST-2.4 design reference mission, with and without the coronagraph, on the basis of their science objectives, technical complexity, and programmatic rationale, including projected cost. This report gives an overview of relevant scientific, technical, and programmatic changes that have occurred since the release of NWNH, and assesses the responsiveness of the WFIRST mission to the science and technology objectives of the NWNH report.

Authors include the Committee on an Assessment of the Astrophysics Focused Telescope Assets (AFTA) Mission Concepts and study director David Lang. *Other staff are listed in the report.*

Copies of this report are available at <www.nap.edu/catalog.php?record_id=18712>.

LLOYD V. BERKNER SPACE POLICY INTERNSHIPS

WE ARE CURRENTLY ACCEPTING APPLICATIONS FOR INTERNSHIPS FOR THE AUTUMN 2014 PROGRAM

The goal of the Lloyd V. Berkner Space Policy Internship program is to provide promising undergraduate and graduate students with the opportunity to work in the area of civil space research policy in the nation's capital, under the aegis of the SSB.

Established in 1958 to serve as the focus of the interests and responsibilities in space research for the National Academies, the Board provides an independent, authoritative forum for information and advice on all aspects of space science and applications, and it serves as the focal point within the National Academies for activities on space research. It oversees advisory studies and program assessments, facilitates international research coordination, and promotes communications on space science and science policy between the research community, the federal government, and the interested public. The SSB also serves as the U.S. National Committee for the International Council for Science Committee on Space Research (COSPAR).

The Lloyd V. Berkner Space Policy Internships, named after the first chair of the SSB, are offered twice annually. The summer program is restricted to undergraduates, and the autumn program is open to both undergraduate and graduate students.

The SSB is now accepting applications from both undergraduate and graduate students for its autumn 2014 program. The deadline for applications is June 6, 2014. Successful candidates will be contacted no later than July 3, 2014.

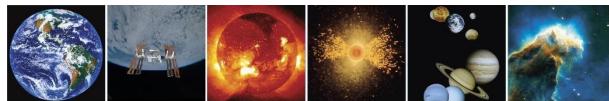
Individuals seeking a Lloyd V. Berkner Space Policy Internship must have the following minimum qualifications:

- Be a registered student at a U.S. university or college;
- Have completed his/her junior year, majoring in physical science or engineering (other areas considered on a case-by-case basis);
- Have long-term career goals in space science research, applications, or policy;
- Possess good written and verbal communications skills and a good knowledge of his/her particular area of study;
- Be capable of responding to general guidance and working independently; and
- Be familiar with the internet and basic research techniques (familiarity with Microsoft Office, as well as HTML, is highly desirable but not essential).

NOTE: SELECTION OF INTERNS AND INITIATION OF PROGRAM IS DEPENDENT ON AVAILABILITY OF FUNDS.

Visit <sites.nationalacademies.org/SSB/ssb_052239> to learn more about the internship program and to get application information.

The SSB's sister Board, the Aeronautics and Space Engineering Board, also publishes a newsletter; visit <http://sites.nationalacademies.org/DEPS/ASEB/DEPS_046908> to subscribe or to view past newsletters. SSB's division, the Division on Engineering and Physical Sciences, also publishes a newsletter; visit <http://sites.nationalacademies.org/DEPS/DEPS_059299> to subscribe.



News from the National Academies

National Academy of Sciences members and Foreign Associates Elected



On April 29, 2014 the National Academy of Sciences announced the election of 84 new members and 21 foreign associates from 15 countries in recognition of their distinguished and continuing achievements in original research. The 2014 election brings the number of active members to 2,214 and the number of foreign associates to 444.

Three of the newly elected members have recently served on Space Studies Board and Board on Physics and Astronomy activities. **Fiona Harrison**, Benjamin M. Rosen Professor of Physics and Astronomy at the California Institute of Technology, is a former Space Studies Board

member (2007-2013) and recently chaired the Committee on an Assessment of the Astrophysics Focused Telescope Assets (AFTA) Mission Concepts whose report, *Evaluation of the Implementation of WFIRST/AFTA in the Context of New Worlds, New Horizons in Astronomy and Astrophysics*, was just released. **Daniel Eisenstein**, Harvard University professor of astronomy served on the Astro2010 Panel on Optical and Infrared Astronomy from the Ground. **Jerry Melillo**, Distinguished Scientist and director emeritus, Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA served on the Earth Science and Applications from Space decadal survey Panel on Land-Use Change, Ecosystem Dynamics and Biodiversity.

Victor J. Dzau, M.D., to be next Institute of Medicine President



Victor J. Dzau, M.D., has been named to be the next president of the Institute of Medicine, the National Academy of Sciences. Currently chancellor for health affairs at Duke University, president and CEO for Duke University Health System, and James B. Duke Professor of Medicine, Dzau will succeed Harvey V. Fineberg, who has served as IOM's president for 12 years. Dzau's 6-year term as president will begin July 1, 2014.

Dzau is highly regarded as a trailblazer in translational research, health innovation, and global health care strategy and delivery. He was the guiding force in establishing the Duke Translational Medicine Institute, Duke Global Health Institute, Duke-NUS Medical School in Singapore, and Duke Institute for Health Innovation.

News from the Space Studies Board

IAU General Assembly 2015



David Spergel, current chair of the Committee on Astronomy and Astrophysics and incoming chair of the SSB, was recently notified by the Executive Committee of the International Astronomical Union (IAU) that his proposal for a focus meeting at the IAU General Assembly 2015 was accepted. Dr. Spergel's focus meeting, "Global Coordination of International Astrophysics and Heliosphere Activities from Space and Ground" was one of 43 proposals that the IAU Executive Committee reviewed for approximately 20 focus meeting slots at the General Assembly. The proposal development process—led by Dr. Spergel—was truly an international effort, involving prominent scientists on the organizing committee representing nine countries, including members of the NRC's CAA and Committee on Solar and Space Physics. The organizing team is responsible for the continued development and refinement of the focus meeting programming.

The focus meeting will address issues involved with coordinating astrophysics and heliosphere activities internationally, and participants will discuss four main topics: global coordination of national and international strategic planning; open data policies; open access policies for facilities and instruments; and reciprocity.

American Academy of Arts and Sciences 2014 Members-Elect

The American Academy has announced its 2014 class of new members, which includes leaders in the sciences, social sciences, humanities, arts, business, public affairs, and the nonprofit sector. A press release announcing the election of the class is below. The complete list of new members is located at <<https://www.amacad.org/members>>.

The newly elected candidates include several current and former members of the National Academies and the National Research Council's ad hoc committees. The Astronomy (including Astrophysics) and Earth Sciences section includes **Neta Assaf Bahcall** (NAS), **Kenneth A. Farley**, **Inez Fung** (NAS, and former member of the SSB's Committee on Earth Science and Applications from Space), **Lawrence Grossman** (former member of the SSB's Committee on Planetary and Lunar Exploration), **Fiona Anne Harrison** (newly elected NAS member, and former member of the SSB), **Wayne Hu**, and **Robert Dirk van der Hilst**.



Staff News

Christine Mirzayan Science and Technology Policy Graduate Fellowship Program

Over the years, the SSB has participated in the Christine Mirzayan Science and Technology Policy Graduate Fellowship Program. This winter we were joined by Padmashri Suresh.

More information on the fellowship can be found at <sites.nationalacademies.org/PGA/policyfellows/index.htm>.

Lloyd V. Berkner Space Policy Internship

In June the SSB will be joined by two new Lloyd V. Berkner Space Policy Interns, Evan Linck and Ian Szumila. More information on Evan and Ian will be included in the next newsletter.

Applications for the program's Autumn 2014 session are being accepted between April 1, 2014, and June 6, 2014. Selections will be made by July 3, 2014. Details concerning the program can be found at <sites.nationalacademies.org/SSB/ssb_052239>.

Space Studies Board Annual Report—2013



The *Space Studies Board Annual Report* summarizes the activities of the Board and its committees, including summaries of regular reports released during the year. Other features include an overview of the structure and operations of the Board, a cumulative bibliography since 1958, and a DVD Compilation of SSB Reports. The report is posted at <http://www.nap.edu/catalog.php?record_id=18743>.

Limited copies are available. See the last page of this newsletter to order a copy.

SSB STAFF

MICHAEL H. MOLONEY	ANDREA REBOLZ*
Director	Program Associate
ARTHUR A. CHARO	ANESIA WILKS
Senior Program Officer	Program Assistant
SANDRA J. GRAHAM	TANJA E. PILZAK
Senior Program Officer	Manager, Program Operations
IAN W. PRYKE**	CHRISTINA O. SHIPMAN
Senior Program Officer	Financial Officer
DAVID H. SMITH	CARMELA J. CHAMBERLAIN
Senior Program Officer	Administrative Coordinator
DWAYNE A. DAY*	CELESTE A. NAYLOR
Senior Program Officer	Information Management Associate
DAVID LANG*	SANDRA WILSON
Program Officer	Senior Financial Assistant
MEG KNEMEYER	JINNI MEEHAN
Financial Officer	Lloyd V. Berkner Space Policy Intern
ABIGAIL SHEFFER	SIERRA SMITH
Associate Program Officer	Lloyd V. Berkner Space Policy Intern
LEWIS GROSWALD	* Staff of other NRC boards who are shared with the SSB.
Associate Program Officer	**through April 18
DIONNA WILLIAMS	
Program Associate	

More information on the SSB and ASEB Board Meetings is at <http://sites.nationalacademies.org/SSB/SSB_054577> (SSB) and <http://sites.nationalacademies.org/DEPS/ASEB/DEPS_058923> (ASEB)



SSB Calendar

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April 3-4

Space Studies Board (joint with the ASEB on April 3)

Washington, DC

April 23-25

Committee on a Framework for Analyzing the Needs for Continuity
of NASA-Sustained Remote Sensing Observations of the Earth
from Space

Irvine, CA

May 28-29

Terrestrial Organic Contamination Requirements Associated with Mars Sample
Caching and Return for Planetary Protection: A Meeting of Experts

Irvine, CA

June 3-4

Committee on Earth Science and Applications from Space

Irvine, CA

July 2-3

Space Studies Board Executive Committee

Woods Hole, MA

Future Meetings

SSB Fall 2014 Meeting, November 5-6, 2014, Irvine, CA

NRC Space Science Week, March 31-April 2, 2015, Washington, DC (proposed)

SSB Spring 2015 Meeting – April 28-29, 2015, Washington DC (proposed)

SSB Fall 2015 Meeting –November 4-5, 2015, Irvine CA (proposed)

SSB Spring 2016 Meeting – April 26-27, 2016, Washington DC (proposed)

Our meeting facilities



National Academy of Sciences
Building
2101 Constitution Ave NW
Washington, DC

Keck Center
of the National Academies
500 Fifth St NW,
Washington, DC

Arnold and Mabel Beckman
Center of the National Academies
100 Academy Drive
Irvine, CA

J. Erik Jonsson Conference Center
314 Quissett Ave
Woods Hole, MA



SELECTED REPORTS AVAILABLE FROM THE SPACE STUDIES BOARD

For a complete list of titles visit our website at <http://sites.nationalacademies.org/SSB/ssb_051650>

Free PDF versions of all SSB reports are available online at <<http://www.nap.edu>> and on the DVD (listed below)



- Evaluation of the Implementation of WFIRST/AFTA in the Context of New Worlds, New Horizons in Astronomy and Astrophysics (2014)
- Space Studies Board Annual Report 2013 (2014) **Book and CD**
- The Space Studies Board 1958-2014: Compilation of Reports (2014) **DVD**
- Review of the Draft 2014 Science Mission Directorate Science Plan (2014)
- Opportunities for High-Power, High-Frequency Transmitters to Advance Ionospheric/Thermospheric Research: Report of a Workshop (2014)
- Lessons Learned in Decadal Planning in Space Sciences: Summary of a Workshop (2013) **Book and CD**
- Landsat and Beyond: Sustaining and Enhancing the Nations Land Imaging Program (2013)
- Solar and Space Physics: A Science for a Technological Society (2013) **Book and CD**
- NASA's Strategic Direction and the Need for a National Consensus (2012)
- The Effects of Solar Variability on Earth's Climate: A Workshop Report (2012)
- Vision an Voyages for Planetary Science (2012) **Booklet**
- The Role of Life and Physical Sciences (2012) **Booklet**
- Earth Science and Applications from Space: A Midterm Assessment of NASA's Implementation of the Decadal Survey (2012) **Book and CD**
- Assessment of Planetary Protection Requirements for Spacecraft Missions to Icy Solar System Bodies (2012)
- Assessment of a Plan for U.S. Participation in Euclid **CD Only**
- Technical Evaluation of the NASA Model for Cancer Risk to Astronauts Due to Space Radiation
- Report of the Panel on Implementing Recommendations from the New Worlds, New Horizons Decadal Survey (2012)
- Sharing the Adventure with the Public—The Value of Excitement: Summary of a Workshop (2011)

If you are unable to email your request, please send a copy of this form to the address or fax number below. Remember to enter the number of reports you wish to receive in the space to the left of each report.

Space Studies Board
The National Academies
500 Fifth Street, NW
Washington, DC 20001
or fax a copy to: 202-334-3701

Hardcopy versions of all SSB reports are available free of charge from the SSB while supplies last.

To request a hardcopy of a report, send an email to ssb@nas.edu and include your name, affiliation, mailing address, and the name and quantity of each report that you are requesting.



- Recapturing a Future for Space Exploration: Life and Physical Sciences Research for a New Era (2011) **Book and CD**
- Visions and Voyages for Planetary Science in the Decade 2013-2022 (2011) **Book and CD**
- Assessment of Impediments to Interagency Collaboration on Space and Earth Science Missions (2011)
- Forging the Future of Space Science: The Next 50 Years (2010) **CD Only**
- Panel Reports—New Worlds, New Horizons in Astronomy and Astrophysics (2011)
- New Worlds, New Horizons in Astronomy and Astrophysics (2010)
- Controlling Cost Growth of NASA Earth and Space Science Missions (2010) **CD Only**
- Capabilities for the Future: An Assessment of NASA Laboratories for Basic Research (2010) **CD Only**
- Revitalizing NASA's Suborbital Program: Advancing Science, Driving Innovation, and Developing a Workforce (2010)
- Defending Planet Earth: Near-Earth Object Surveys and Hazard Mitigation Strategies (2010) **CD Only**
- An Enabling Foundation for NASA's Space and Earth Science Missions (2010)
- America's Future in Space: Aligning the Civil Space Program with National Needs (2009)
- Approaches to Future Space Cooperation and Competition in a Globalizing World: Summary of a Workshop (2009)
- Radioisotope Power Systems: An Imperative for Maintaining U.S. Leadership in Space Exploration (2009) **CD Only**
- Assessment of Planetary Protection Requirements for Mars Sample Return Missions (2009)
- Severe Space Weather Events—Understanding Societal and Economic Impacts: A Workshop Report (2008) **CD or Executive Summary**

Name	E-mail
Affiliation	
Address	City/State/Zip