


JULY - SEPTEMBER 2016

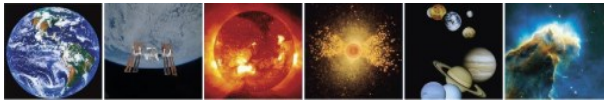
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Dr. Macauley was given the Women in Aerospace (WIA) Lifetime Achievement Award “for posthumous recognition as an economist, having successfully pioneered the field of space economics over the lifetime of her professional career and contributing to academic and public policy impacts of linking economics with space science.”

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JULY 1, 2016—JUNE 30, 2017

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SSB Member News

Molly Macauley honored by the WIA and RFF

Former SSB and CESAS member Molly Macauley was posthumously honored at the Women in Aerospace (WIA) Awards dinner on October 13, 2016. Dr. Macauley was given the WIA Lifetime Achievement Award “for posthumous recognition as an economist, having successfully pioneered the field of space economics over the lifetime of her professional career and contributing to academic and public policy impacts of linking economics with space science.”



Photo courtesy of Resources for the Future

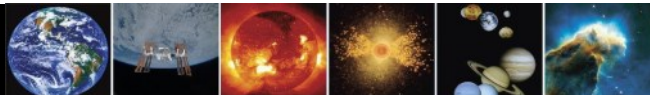
Resources for the Future, where Dr. Macauley was Senior Fellow and Vice President for Research and spent more than three decades of her professional career, has established an award in her name—the Molly K. Macauley Award for Research Innovation and Advanced Analytics for Policy. The award will be “a competitive grant of \$100,000 on a biennial basis for new research aimed at leveraging the power of Earth observation and other advanced technologies and analytical techniques to inform environmental, natural resource, energy, and climate policy.” More information on supporting or applying for the Macauley Award can be found at <http://www.rff.org/about/molly-k-macauley-award-research-innovation-and-advanced-analytics-policy>.

Thomas Zurbuchen leading NASA Science

Former SSB member Thomas Zurbuchen was named Associate Administrator for the Science Mission Directorate. Previously, he was a professor of space science and aerospace engineering at the University of Michigan. He was also founding director of the Center for Entrepreneurship in the College of Engineering. Dr. Zurbuchen has worked extensively with the National Academies of Sciences, Engineering, and Medicine, most recently serving as the chair of the Committee on Achieving Science Goals with CubeSats and as vice-chair of the Committee on a Decadal Strategy for Solar and Space Physics (Heliophysics).



Photo courtesy of NASA



Staff News

The SSB welcomed 2 new Lloyd V. Berkner Space Policy Interns this quarter, Cherie Achilles and Sarah Peacock.

Cherie Achilles is currently a Ph.D. student studying geosciences at The University of Arizona. Her research focuses on martian surface materials, specifically the crystalline and amorphous phases comprising rocks and sediments analyzed by the Mars Science Laboratory (MSL) rover. Prior to entering graduate school, Cherie received her Bachelor of Science degree in Molecular and Cellular Biology and in Microbiology from The University of Arizona in 2008. From 2005 -2008, she was a member of the engineering and operations team for the Surface Stereo Imager on the Phoenix Mars Lander. Following the Phoenix mission, Cherie joined the Astromaterials and Research Exploration Science group at NASA Johnson Space Center (JSC). While at JSC she was involved in several Mars-related research projects and became a member the MSL Science Team working with the CheMin instrument. In addition to her involvement with the Mars research group, she contributed to the analysis of interplanetary dust particles as well as the sampling and analysis of hypervelocity impact structures from space hardware (e.g., Space Shuttle, ISS). Cherie left JSC in 2013 to pursue her Ph.D. but continues her involvement in CheMin operations and research while at Arizona.

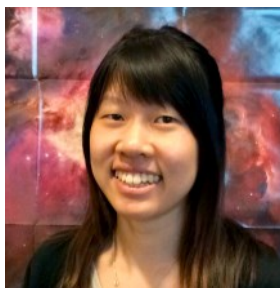


Sarah Peacock is a fourth year doctoral candidate and NASA Earth and Space Science Fellow studying Planetary Sciences at the University of Arizona's Lunar and Planetary Laboratory. She is interested in exoplanet atmospheres and habitability. Her current research involves modeling the high-energy radiation environment around M dwarf stars and applying that radiation to planetary atmospheres. The goal of her work is to determine if a planet in the commonly-defined habitable zone around these stars can, in fact, be habitable. In addition to research, Sarah co-organizes and runs The Art of Planetary Science, an annual planetary science themed art exhibition at the U of Arizona. She also serves on several department committees including coordinating the graduate student colloquium series and serving as the department representative to the Graduate and Professional Student Council. Sarah received her M.S. in Planetary Sciences from the University of Arizona in 2016 and her B.A. in Astronomy-Physics from the University of Virginia in 2013. She is motivated to pursue a career in policy making and sees her internship with the SSB as an invaluable learning experience in transitioning to the space policy field.



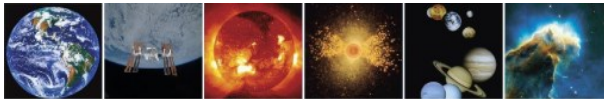
Caroline Juang completed her term as a Lloyd V. Berkner Space intern in August 2016. Her reflections on her experience with the SSB are below.

This summer has probably been one of the most productive 3 months I've ever had. Throughout my time as a Lloyd V. Berkner Space Policy Intern, I researched background information, wrote countless presentation recaps and biosketches, and completed other tasks for different stages of the SSB report process. I also kept busy with communications work; I wrote a report brief reviewing the Federal Aviation Administration's technology certification research plan and brainstormed report covers. Additionally, I sat in on conferences, SSB meetings, and congressional hearings. I enjoyed learning about the most recent discoveries directly from the experts. It is a completely different experience to hear the details of the upcoming OSIRIS-REx launch from the mission leads and not just in the news! Out of all that I have done, I most enjoyed writing about the scientific discoveries of the Opportunity rover, brainstorming a space defense report cover, speaking to committee members at the Earth Sciences and Applications from Space (ESAS) Decadal Survey Jamboree in Irvine, CA, and listening to the space partnerships between the US and Japan at the 21st "Science in Japan" Forum. I gained valuable experiences from all the different sides that make up the space field and was excited to exercise my knowledge from my major, Earth and Planetary Sciences, and my creativity.



I am thankful for the opportunity to work with the SSB on reports that have a huge impact on the future of U.S. space science. I have met many amazing people who have taught me about the workings of the National Academies of Sciences, Engineering, and Medicine, imparted their wisdom about all aspects of space exploration and policy, and have become my friends. This internship helped me learn more about myself as well, allowing me reflect on possible career paths after I graduate next May. I hope to continue in space policy in the future or in research to advance space science. Finally, I am grateful I was able to be a contributing member of the SSB. I hope that I advanced the goals of the Academies and made the jobs of the SSB staff a little easier.

One of our research associates, Charlie Harris, took a new position at the Space Foundation in September. We will miss Charlie and all of his contributions to the Board. We have selected a new research associate, Marchel Holle, who will start working with the SSB on October 31.



SSB ACTIVITIES

THE BOARD AND ITS STANDING COMMITTEES

The **Space Studies Board (SSB)** did not meet during this quarter, but the SSB Executive Committee (XCOM) met in Woods Hole, MA, August 11-12, 2016. The XCOM had discussions regarding the most pressing issues facing different groups in the space community including standing committee chairs (CAA, CAPS, CESAS, CSSP, CBPSS); the NAC (Bradley Peterson, NAC Science Committee Chair); the Science Mission Directorate (Geoff Yoder, Acting Associate Administrator, SMD/NASA); Congressional views (Pam Whitney, House Science Committee); and the White House (Tammy Dickinson, OSTP). They also discussed some future activities and potential challenges including planetary protection, strategic issues in space for the new Administration, the journey to Mars and the implications for science, and open code and NASA science. The XCOM also received a briefing on the new report *New Worlds, New Horizons: A Midterm Assessment* from the committee chair, Jackie Hewitt, and then had a discussion on planning for the next decadal survey, Astro2020. And finally they had a planning discussion about a focus session on Space Weather that will be held at the November meeting.

The Board's next meeting is November 2-4, 2016 in Irvine, CA. Visit www.nas.edu/ssb to stay up to date on board, workshop, and study committee meetings and developments.

The standing committees supported by NASA-SMD (**CAA, CAPS, CESAS, and CSSP**) are holding their last meetings this fall before, on January 1, 2017, they will be reconstituted as discipline committees. The new status will enable them to draft reports containing consensus conclusions and findings on the implementation of their respective decadal surveys.

The **Committee on Astrobiology and Planetary Science (CAPS)** met at the National Academies' Beckman Center in Irvine, California, on 14-15 September for their annual fall meeting. The next meeting of CAPS will be held at the National Academy of Sciences Building in Washington, D.C. as part of Space Science Week on March 28-30, 2017. To learn about upcoming meetings, and download presentations from past meetings, please visit http://sites.nationalacademies.org/SSB/SSB_067577.

The **Committee on Astronomy and Astrophysics (CAA)** did not meet in person this quarter but continued to have active discussions about preparations for the next decadal survey. Co-chair Marcia Rieke represented the committee at the SSB XCOM meeting on August 11-12 in Woods Hole, MA. The next committee meeting will take place October 31-November 1 in Irvine, CA. For more information about the CAA, and to download presentations from past meetings, please visit http://sites.nationalacademies.org/BPA/BPA_048755.

The **Committee on Biological and Physical Sciences in Space**

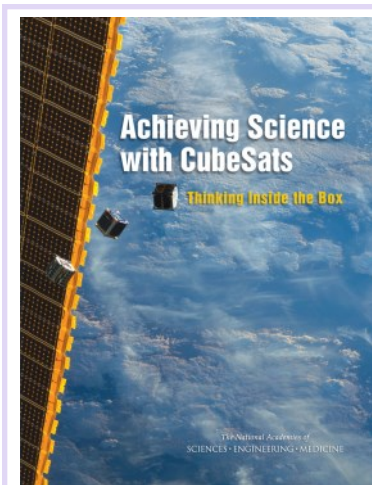
(**CBPSS**) stood down for much of this period while the Board's contract renewal process was underway. However, the staff did continue its discussions with NASA and members of the community regarding a mid-term review of the microgravity decadal survey, and that study is now expected to begin this fall with the appointment of an ad hoc committee. CBPSS also underwent a scheduled membership rotation in this period and the new roster can be found at http://sites.nationalacademies.org/SSB/SSB_145312. The committee plans to hold its next meeting on Dec. 12-14, 2016 in Irvine, CA.

As the 3rd quarter ended, the **Committee on Earth Science and Applications from Space (CESAS)** was preparing for its meeting on October 4-5, 2016 in Washington, DC. In addition to agency-provided updates on the land imaging programs at USGS and activities within NASA's Earth Science Division and NOAA NESDIS, the meeting will feature sessions devoted to an exploration of data issues of interest to both the committee and to ESAS 2017 (see above). Among the topics to be explored are Big Data and Earth Science, the impact of cloud computing, new roles for the commercial sector in data acquisition and processing, and whether there are areas that require near-term attention to prepare for Earth science data needs through the decadal survey interval, 2017-2027, and beyond. The CESAS website, http://sites.nationalacademies.org/SSB/SSB_066587 and links therein have further about this meeting and other recent meetings.

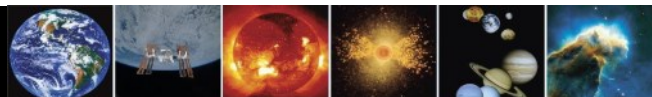
As the 3rd quarter ended the **Committee on Solar and Space Physics (CSSP)** was preparing for their fall meeting on October 5-7, 2016 in Washington, DC. The committee has also met via teleconference monthly to discuss current events as well as meeting planning. Further information about the committee is available at http://sites.nationalacademies.org/SSB/SSB_052324.

STUDY COMMITTEES

The **Committee on the Assessment of the National Science Foundation's 2015 Geospace Portfolio Review** held their second meeting July 18-19, in Washington, DC. The committee held follow up discussions with the PRC chair, heard perspectives on the review from the Director of the Division of Atmospheric and Geospace Sciences, and was briefed on the recently released report of the National Academies regarding the science potential for CubeSats. The committee also heard from selected members of the geospace science community with experience and perspective relevant to Geospace facilities and programs. The committee held their third and final meeting August 21-22, in Woods Hole, MA, to prepare a draft of their report. The committee has also held several teleconferences to discuss their task. More information about this project is available at http://sites.nationalacademies.org/SSB/CurrentProjects/SSB_169109.



Achieving Science with CubeSats: Thinking Inside the Box
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The **2017-2027 Decadal Survey for Earth Science and Applications from Space (ESAS 2017)** was very active during the quarter. In addition to numerous teleconferences among and between the steering committee and panels, each of the survey's five panels held their second of three planned meetings. At these meetings, the panels assessed challenges and opportunities for the disciplines under their purview as well as connections to major themes in Earth System Science. They also continued to review community responses to the survey's 2 RFIs (requests for information); held briefings by members of the panel, agency officials, and others; and began work on their report-back assignments to the steering committee. Recognizing the importance of exploring the interdisciplinary science that might not be captured by the panels, representatives from the steering committee and the panels also met in September for a 1.5-day "Integrating Themes" workshop. The workshop provided a forum to view panel activities with an eye towards their contributions in addressing key challenges in Earth System Science. As the quarter ended, the survey steering committee was preparing for a November 7-10 meeting in Irvine, California. Some 100 members of the community are participating on one or more of the survey's committees. Links on the survey website, www.nas.edu/esas2017, describe survey activities during the quarter in more detail; also posted on the website are survey newsletters to the community. The survey co-chairs will be presenting updates to the community in a town hall at the fall meeting of the American Geophysical Union in San Francisco (December 13, 2016 from 12:30-1:30pm; Moscone West-Room 2007) and at the 97th Annual Meeting of the American Meteorological Society in Seattle (January 24, 2016 from 6:30-7:30pm; room to be announced).

The **Committee on Large Strategic NASA Science Missions: Science Value and Role in a Balanced Portfolio** was initiated in March. The committee is co-chaired by Kathy Thornton of the University of Virginia and Ralph McNutt of the Johns Hopkins Applied Physics Laboratory. The committee held its first meeting October 5-6 at the Keck Center where it heard from the new Associate Administrator for the Science Mission Directorate Thomas Zurbuchen, the NASA division directors, and former Associate Administrator John Grunsfeld. Among the issues that the committee discussed were the definition of large strategic missions, and how they are being conducted within NASA. The committee will hold its second meeting December 7-9 at the Beckman Center in Irvine where it will hear from people who run large missions as well as from those involved in the decadal surveys. The committee will hold its third meeting in early 2017. The committee plans to deliver its report to NASA in spring 2017. Additional information about this project can be found at http://sites.nationalacademies.org/SSB/CurrentProjects/SSB_173492.

The **Committee on NASA Science Mission Extensions** delivered its final report to NASA which went public in early September. The co-chairs Vicky Hamilton and Harvey Tananbaum briefed the re-

port to NASA officials and congressional staff and have also been invited to present the results to NASA advisory organizations. The report recommended that the 2-year cadence for conducting senior reviews of extended missions should be increased to every three years to increase efficiency. The committee generally found that NASA's process for extending science missions is well-run and delivers tremendous value to the nation. The report provides numerous examples of major scientific discoveries made in the extended phase of numerous missions across all of NASA's space science disciplines. More information about this project can be found at: http://sites.nationalacademies.org/SSB/CurrentProjects/SSB_169078.

The Committee on the Review of NASA's Planetary Science Division's Restructured Research and Analysis Programs held

its second and third meetings during this quarter. The second meeting was held at the National Academy of Sciences Building in Washington, D.C., on August 16-18. Whereas the committee's first meeting was devoted to hearing input from the members of the planetary science community, via representatives from the various analysis and assessment groups, the second meeting was primarily devoted to hearing input from the various NASA science centers. The chief scientists, or their representatives, from the Ames Research Center, Goddard Space Flight Center, Jet Propulsion Laboratory, Johnson Space Center, and Marshall Space Flight Center gave brief presentations in response to a series of questions posed to them by the committee. The presentations from the NASA centers were supplemented by additional input from SBAG and OPAG together with presentations from NASA

Chief Scientist and the out-going chair of the Planetary Science Subcommittee of the NASA Advisory Council. The committee's third and final meeting was held at the National Academies' Jonsen Center in Woods Hole, Massachusetts, on 21-23 September. Although most of the meeting was devoted to discussion, deliberation and drafting of sections of the committee's report, the committee did receive input on a keyword analysis activity undertaken by NASA at the committee's request. The committee plans to assemble a complete draft of its report in October and a final, approved draft is scheduled to be delivered to NASA early in the New Year. Additional information about this project can be found at http://sites.nationalacademies.org/SSB/CurrentProjects/SSB_169563.

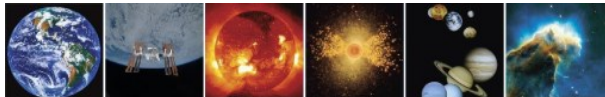
The **Committee for the Review of Progress Toward the Decadal Survey Vision in New Worlds, New Horizons in Astronomy and Astrophysics** released its final report in August 2016. For more information on the project please visit: http://sites.nationalacademies.org/SSB/CurrentProjects/SSB_161177. The full publication version of the report is available at <http://www.nap.edu>.

The organizing committee for the workshop, **Searching for Life Across Space and Time**, held its one and only scheduled meeting

**NEW WORLDS,
NEW HORIZONS**
A Midterm Assessment

The National Academies of
SCIENCES-ENGINEERING-MEDICINE

New Worlds, New Horizons: A
Midterm Assessment
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at the National Academy of Sciences Building in Washington, D.C., on September 27-28. The committee heard presentation from the directors of NASA's Planetary Science Division, Astrophysics Division, and Astrobiology Program on their expectations for the workshop. The committee also ratified decisions concerning specific agenda items made during a series of committee-wide conference calls held during the summer and issued invitations to fill the few remaining timeslots on the program. The workshop will be held December 5-6 at the Academies' Beckman Center in Irvine, CA. Additional details about the workshop can be found at <http://sites.nationalacademies.org/ssb/currentprojects/ssb_173278>.

OTHER ACTIVITIES

The **Forum for New Leaders in Space Science** is a cooperative activity between the Academies and the Chinese Academy of Sciences (CAS) and is designed to provide opportunities for a highly select group of young space scientists from China and the United States to discuss their research activities in an intimate and collegial environment. The third cohort of participants, representing the life- and physical-science research communities, was recruited in August. This group of 16 young scientists selected will participate in the fifth and six forums, to be held in Beijing (December 2-3, 2016) and Woods Hole (May 16-17, 2017), respectively. Also selected in August were the two senior US scientists—James Pawelczyk (Pennsylvania State University) and Peter Voorhees (Northwestern University)—who will participate in the Beijing and Woods Hole forums. Additional details concerning this activity can be found at http://sites.nationalacademies.org/SSB/SSB_o86o17.

COSPAR is currently recovering from the unprecedented cancellation of its 41st Scientific Assembly, which had been scheduled to take place in Istanbul, Turkey in August. Efforts are now underway to recover and recoup the business, organizational, and planning activities typically undertaken by the COSPAR Council, Bureau, Scientific Commissions, and Panels during assemblies. First orders of business for the Council are the approval of COSPAR's budget for 2017 and the selection of the site for the 2020 Scientific Assembly. The four teams contending for the 2020 assembly, have put together video presentations extolling the virtues of their proposed locations—Lausanne, Prague, Shanghai, and Sydney—and the Council members will vote electronically after reviewing these presentations and the report of a site-assessment group empaneled by COSPAR President Lennard Fisk. The work of the Scientific Commissions and the Panels, principally the planning of sessions for the 2018 assembly in Pasadena, will proceed via email and other virtual modalities. The next round of COSPAR business meetings will take place at COSPAR headquarters in Paris on March 20-22, 2017.

Planetary Protection for Outer Solar System Bodies: This 3-year activity, funded via the European Union's Horizon 2020 funding program and organized by the European Science Foundation, is designed to address a series of closely related topics in the general area of planetary protection. The project was formally initiated in January, 2016, and its steering group met for the first time in Paris on March 25. PPOSS' next major activity was to be a workshop on the margins of the COSPAR Scientific Assembly in Istanbul, Turkey, on July 31. However, given the cancellation of the COSPAR Assembly, the workshop was re-scheduled and held at ESA's ESTEC, Noordwijk, the Netherlands, on September 19. The next set of PPOSS meetings are scheduled to occur at the German Aerospace Center in Cologne on December 14-15, 2016 and January 23-27, 2017. Although the National Academies' is not formally involved in this project, the Space Studies Board has observer status on the PPOSS steering group and has agreed to sponsor the participation of several US participants in a subset of PPOSS activities. Additional information about PPOSS can be found at <http://pposs.org/>.

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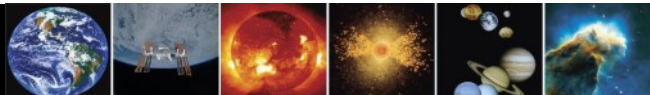
CHERIE ACHILLES
Lloyd V. Berkner Space Policy Intern

SARAH PEACOCK
Lloyd V. Berkner Space Policy Intern

* Staff of other Academies boards who are shared with the SSB.

Through August 2016

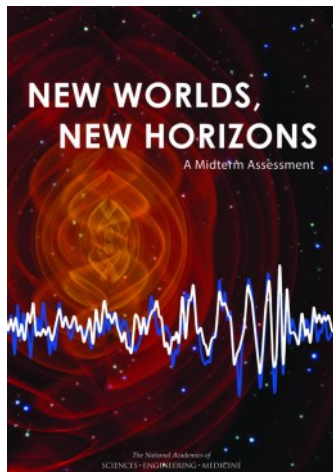
The SSB's sister Board, the Aeronautics and Space Engineering Board, also publishes a newsletter; visit <http://sites.nationalacademies.org/DEPS/ASEB/DEPS_o469o8> to subscribe or to view past newsletters. SSB's division, the Division on Engineering and Physical Sciences, also publishes a newsletter; visit <http://sites.nationalacademies.org/DEPS/DEPS_o59299> to subscribe.



NEW RELEASES

Copies of reports are available from the SSB office at 202-334-3477 or at <http://www.nap.edu/>.

New Worlds, New Horizons: A Midterm Assessment



New Worlds, New Horizons in Astronomy and Astrophysics (NWNH), the report of the 2010 decadal survey of astronomy and astrophysics, put forward a vision for a decade of transformative exploration at the frontiers of astrophysics. This vision included mapping the first stars and galaxies as they emerge from the collapse of dark matter and cold clumps of hydrogen, finding new worlds in a startlingly diverse population of extrasolar planets, and exploiting the vastness and extreme conditions of the universe to reveal new information about the fundamental laws of nature. NWNH outlined a compelling program for understanding the cosmic order and for opening new fields of inquiry through the discovery areas of gravitational waves, time-domain astronomy, and habitable planets. Many of these discoveries are likely to be enabled by cyber-discovery and the power of mathematics, physics, and imagination. To help realize this vision, NWNH recommended a suite of innovative and powerful facilities, along with balanced, strong support for the scientific community engaged in theory, data analysis, technology development, and measurements with existing and new instrumentation. Already in the first half of the decade, scientists and teams of scientists working with these cutting-edge instruments and with new capabilities in data collection and analysis have made spectacular discoveries that advance the NWNH vision.

New Worlds, New Horizons: A Midterm Assessment reviews the responses of NASA's Astrophysics program, NSF's Astronomy program, and DOE's Cosmic Frontiers program to NWNH. This report describes the most significant scientific discoveries, technical advances, and relevant programmatic changes in astronomy and astrophysics over the years since the publication of the decadal survey, and assesses how well the Agencies' programs address the strategies, goals, and priorities outlined in the 2010 decadal survey.

Available at <https://www.nap.edu/catalog/23560/new-worlds-new-horizons-a-midterm-assessment>.

Extending Science—NASA's Space Science Mission Extensions and the Senior Review Process

NASA operates a large number of space science missions, approximately three-quarters of which are currently in their extended operations phase. They represent not only a majority of operational space science missions, but a substantial national investment and vital national assets. They are tremendously scientifically productive, making many of the major discoveries that are reported in the media and that rewrite textbooks.

Extending Science – NASA's Space Science Mission Extensions and the Senior Review Process evaluates the scientific benefits of missions extensions, the current process for extending missions, the current biennial requirement for mission extensions, the balance between starting new missions and extending operating missions, and potential innovative cost-reduction proposals for extended missions, and makes recommendations based on this review.

Available at <https://www.nap.edu/catalog/23624/extending-science-nasas-space-science-mission-extensions-and-the-senior-review-process>.

SSB STANDING COMMITTEE CO-CHAIRS

Committee on Astrobiology and Planetary Science (CAPS)

Philip R. Christensen, Arizona State University
Christopher H. House

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

Marcia Rieke, University of Arizona
Steven Ritz, University of California, Santa Cruz

Committee on Biological and Physical Sciences in Space (CBPSS)

(joint with the Aeronautics and Space Engineering Board)

Elizabeth Cantwell, Arizona State University
Robert J. Ferl, University of Florida

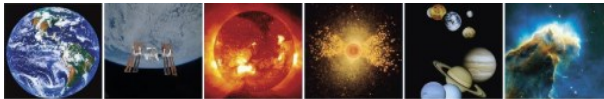
Committee on Earth Science and Applications from Space (CESAS)

Michael D. King, University of Colorado, Boulder
Joyce E. Penner, University of Michigan

Committee on Solar and Space Physics (CSSP)

J. Todd Hoeksema, Stanford University
Mary K. Hudson, Dartmouth College

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



SEARCHING FOR LIFE ACROSS SPACE AND TIME

A Space Studies Board Workshop



The Space Studies Board's Committee on Searching for Life Across Space and Time is hosting a community workshop and poster session on December 5-6, 2016 at the Beckman Center in Irvine, CA to explore the current status of activities to detect extraterrestrial life in the solar system and extrasolar planetary systems. The workshop will feature a series of sessions that will feature presentations from experts on current understanding of the environmental (physical and chemical) limits of life, life's interactions with the environments of planets and moons, habitable environments in the solar system and extrasolar planetary systems, extraterrestrial biosignatures, life detection capabilities remotely or in situ in the solar system and from afar on extrasolar worlds, instrumentation, and targeted precursor research.

To register as a poster presenter or participant and learn more about the workshop, please visit: [SearchingForLife.eventbrite.com](https://www.eventbrite.com). The deadline for poster abstracts is November 7, 2016.

For those unable to attend in person, the live workshop webcast will be available at: <https://livestream.com/accounts/15221519/events/6098927>. Please note that online audience participation during question and answer sessions will not be possible.

For questions about the event, please contact Dionna Williams at dwilliams@nas.edu.

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SSB Calendar

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J A N U A R Y						
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October 4-5	Committee on Earth Science and Applications from Space	Washington, DC
October 5-7	Committee on Solar and Space Physics	Washington, DC
October 5-6	Large Strategic NASA Science Missions: Science Value and Role in a Balanced Portfolio	Washington, DC
Oct 31-Nov 1	Committee on Astronomy and Astrophysics	Irvine, CA
November 2-4	Space Studies Board	Irvine, CA
November 7-10	Decadal Survey for Earth Science and Applications from Space—Steering Cmte	Irvine, CA
December 5-6	Searching for Life Across Space and Time: A Workshop	Irvine, CA
December 7-8	Large Strategic NASA Science Missions: Science Value and Role in a Balanced Portfolio	Irvine, CA
December 12-14	Committee on Biological and Physical Science in Space (tentative)	Irvine, CA
January 18-20	Decadal Survey for Earth Science and Applications from Space—Steering Cmte	Irvine, CA

More information on the SSB and ASEB Board meetings can be found at
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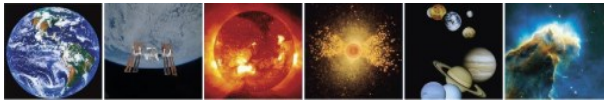
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