Minutes of the Meeting of the
Astronomy and Astrophysics Advisory Committee
26-27 January 2017
National Science Foundation, Arlington, VA

Members attending:

Dieter Hartmann
Rachel Bean
Kelsey Johnson
Buell Jannuzi (Chair)
Shane Larson
Brian Keating
Shane Larson
Rachel Mandelbaum (Vice Chair)
William Smith
Jean Turner
Martin White

Agency personnel:

James Ulvestad, NSF-AST
Chris Davis, NSF-AST
Elizabeth Pentecost, NSF-AST
Ralph Gaume, NSF-AST
Nigel Sharp, NSF-AST
Diana Phan, NSF-AST
Richard Barvainis, NSF-AST
Joan Wrobel, NSF-AST
Joseph Pesce, NSF-AST
Peter Kurczynski, NSF-AST
Jim Neff, NSF-AST
Glen Langston, NSF-AST
Faith Vilas, NSF-AST
Linda French, NSF-AST
Philip Puxley, NSF-AST
Vernon Pankonin, NSF-AST
Thomas Wilson, NSF-AST
Allison Farrow, NSF-AST
Donna O'Malley, NSF-AST
Jean Cottam Allen, NSF-PHY
James Whitmore, NSF-PHY
Vyacheslav Lukin, NSF-PHY
Vladimir Papatashvilli, NSF-Polar
Fatima Touma, NSF-SBE
Paul Hertz, NASA
Hashima Hasan, NASA
Doris Daou, NASA
Kartik Sheth, NASA
Linda Sparke, NASA
James Green, NASA
Eric Tollestrup, NASA
Kathy Turner, DOE
Glen Crawford, DOE
Eric Linder, DOE

Others:

Sara Barber, House Science Comm.
Dana Lehr, AURA
David Lang, NAS
Heather Bloemhard, AAS
Charles Lawrence, JPL
Steve Ritz, UCSD
Roeland van der Marel, STSci
Eric Mamajek, Univ. of Rochester
Jason Rhodes, JPL
Ben Kallen, Lewis-Burke
Steve Unwin, JPL
Rachel Osten, STSci
Alexander Witze

MEETING CONVENED 9:00 AM, 26-27 JANUARY 2017

The Chair called the meeting to order. Introductions were made.

The minutes from the October 27-28, 2016 meeting were approved by the Committee.

Elizabeth Pentecost, the AAAC Recording Secretary, reviewed the list of identified Conflicts of Interest (COIs) for the AAAC and asked that members send their conflicts to her.

The Committee selected September 27-28, 2017 as the dates of the next face-to-face meeting.

Ralph Gaume provided an update on NSF activities. The Division of Astronomical Sciences (AST) and the Directorate for Mathematical and Physical Sciences (MPS) are undergoing a transition. Ralph Gaume was selected as AST Deputy Division Director (DDD) in November 2016; he had been in the Acting DDD role since June 2016. In January 2017 Fleming Crim completed his 4-year term at NSF at which time Jim Ulvestad became Acting Assistant Director (AD) for MPS, Ralph Gaume became Acting AST Division Director (DD), and Edward Ajhar became Acting AST DDD. NSF is currently conducting a search for a new AST DD to replace Jim Ulvestad. Elsewhere in NSF there have been major changes in leadership: new ADs for several of the Directorates and a new Acting Chief Operating Officer have been appointed. In addition to these staff changes, NSF will move from its present location in Arlington, VA to a location in Alexandria, VA in July-September 2017; MPS is scheduled to move over the extended Labor Day weekend.

The American Innovation and Competitiveness Act (AICA) was passed by Congress in December 2016. Provisions of the legislation call for awards to be in the national interest and tied to the broader impacts review criterion. No funding levels were specified for NSF as a whole, or for individual Directorates. The Act also included language regarding facility oversight.

The Federal agencies are operating under a Continuing Resolution (CR) through April 28, 2017. After April 28, there are many possibilities for funding, including a year-long CR, a flat budget with respect to FY2016 funding levels, or a rebalance of military/domestic discretionary spending. There has been no word on what will happen for the FY2018 budget. The Budget Control Act of 2011 set spending caps for the next 10 years. The Bipartisan budget Act of 2015 set caps for FY2016 and FY2017; sequestration is due to return in FY2018.

The NSF Director unveiled concepts for future investment, known as "Big Ideas," in May 2016. This plan was aimed at the new President and Congress. Six research ideas and four process ideas were initially discussed; three research ideas and one process idea were subsequently chosen, with "Windows on the Universe: The Era of Multi-messenger Astrophysics," the idea that most clearly includes MPS-directed research.

Ralph Gaume presented a number of science and facilities highlights. The Atacama Large Millimeter/ submillimeter Array (ALMA) has observed both dust and gas in the circumstellar disk associated with HD163296. Three distinct gaps were observed in the disk: the first gap appears to be depleted in dust but not in gas, which supports non-planetary processes; the second and third gaps are depleted in both dust and gas, which could be caused by the formation of Saturn-mass planets. In a second highlight, the involvement of Arecibo, the Very Large Array (VLA), The Very Large Baseline Interferometer (VLBI), and the Gemini Observatory in the analysis of a Fast Radio Burst, FRB 121102, was presented; the FRB was discovered in the 1.4 GHz **Pulsar** Arecibo L-band Feed Array (**ALFA**) survey, the VLA localized the position and discovered a persistent radio source, the VLBI established the coincidence of the burst and persistent sources, and the Gemini-North telescope then associated the radio source/FRB with a dwarf galaxy. Finally, Dr. Gaume presented an update on AST construction projects. The Daniel K. Inouye Solar Telescope (DKIST) is currently under development and is scheduled for completion in FY2020; the Hawai'i Supreme Court affirmed the construction permit in October 2016. Construction of the Large Synoptic Survey Telescope (LSST) is also progressing and is on schedule for a late 2022 start day for the 10-year survey.

With regard to its Individual Investigator Program, AST received 592 proposals (463 projects) in response to a proposal call in November 2016. This is 2% more proposals than 2015/2016, but fewer than 2014/2015. Panel planning is underway. AST is running a "no proposal deadline" pilot for the

Planetary/Exoplanetary and Solar portions of the Astronomy and Astrophysics Research Grants (AAG) program; the success of this pilot will be assessed at the end of the year.

AST will need to plan for the possibility of no budget increases for the balance of the decade. There is a need to balance facilities, small and mid-scale programs, and individual investigator grants programs. The Mid-decadal survey committee strongly supported this balance. The 2012 Portfolio Review report recommended a balance of small, medium, and large programs that would require divestment of a number of operating telescopes from the AST budget; the report referred to the removal of the funding of telescopes from the NSF/AST budget. The telescopes recommended for divestment are still important, and in some cases unique assets for astronomical research or other related uses, hence, the preferred divestment alternative pursued since 2012 has been to find funding collaborations that enable some continued availability of NSF telescope assets for the research community. Several telescopes slated for divestment have developed partnerships. These include the Kitt Peak National Observatory (KPNO) 2.1m telescope, which will be run by a Caltech-led consortium for Robo-AO, initially for a period FY2016-2018; the Mayall telescope, which is slated for the Dark Energy Spectroscopic Instrument, DESI; the Wisconsin-Indiana-Yale-NOAO (WIYN) telescope, where NOAO's share of telescope time will be used for NASA-NSF Exoplanet Observational Research Programs (a NASA instrument has been selected); the Large Binocular Observatory (LBO)/VLBA, which separated from the National Radio Astronomy Observatory (NRAO) in FY2017 and for which a Memorandum of Agreement with the U.S. Navy is in place, the Navy providing 50% of the funding; and the Global Oscillation Network Group (GONG) and Synoptic Optical Long-term Investigations of the Sun (SOLIS) projects, with SOLIS removed from Kitt Peak for refurbishment and an interagency agreement with the National Oceanic and Atmospheric Administration (NOAA) in place so that NOAA share the operating costs of GONG. Because of the major changes to the operations of several of these facilities, NSF must conduct Environment Impact Statement (EIS) processes as well as National Historic Preservation Act (NHPA) consultation and Endangered Species Act (ESA) consultation processes. These activities are now being pursued for the Arecibo Observatory (a formal EIS is underway and the issuance of a Record of Decision is targeted for 2017; the draft EIS was released October 28, 2016; a final EIS is under preparation); the Sacramento Peak (SacPeak) Observatory (a university consortium of operators is being put together, with NSF funding the New Mexico State University for transition to the consortium; the EIS process has begun - completion is expected in 2017); and the Green Bank Observatory (~25% collaboration for basic scope; the EIS process began on October 19, 2016 - a draft EIS is in preparation). The EIS process is well underway for Arecibo, with SacPeak and Green Bank about 2-6 months behind Arecibo. As part of this process, the Arecibo solicitation was released on January 25, 2017 with proposals due three months later (April 25). A funding profile was provided in the solicitation which stipulated reduced NSF funding and a requirement for outside funding.

David Hogg asked what interest NASA and the NSF Directorate of Geosciences (GEO) have in Arecibo. Dr Gaume replied that NASA is interested in potentially hazardous asteroids. Arecibo is equipped with powerful radar transmitters that may be used to characterize Near Earth Objects (NEOs). NASA has a Congressional mandate to find all asteroids that are greater than 140 meters in size and Arecibo plays a critical part in nailing down on the orbits of many asteroids. The funding comes from the Planetary Defense Office. NSF-GEO does atmospheric research using Arecibo; the telescope is used to study the upper atmosphere and ionosphere.

In October 2015, NSF presented guidance to AURA on planning for LSST operations with the guiding principle, "A close synergistic relationship between NOAO and LSST would serve to optimize operational efficiencies, management efficiencies, and scientific productivity, and would thus be of maximal benefit to the scientific user community and a cost effective benefit to the US public." When it was known that Gemini would be managed by AURA, it became clear to NSF and AURA that the Gemini Observatory would also have many similar benefits of being closely connected to the same

administrative framework. NSF is proceeding to develop a strategy for NSF-funded OIR capabilities to serve as the core of the U.S. OIR System in the era of LSST. This will be implemented through a reorganization of those NSF-funded OIR capabilities. AURA will deliver a plan for the organization, management, and operation of a national center for OIR astronomy, and an implementation plan for LSST, Gemini, and NOAO under an umbrella administrative framework.

Dana Lehr gave a presentation on the planning for a National Center for Optical-Infrared Astronomy (NCOA*(working title)). AURA has been working with NSF on a concept for the Center. The core development team consists of the three Center directors (NOAO, Gemini, LSST), Dana Lehr, and Peg Stanley (consultant). NCOA would represent a single, coherent scientific and service organization for NOAO, Gemini, and LSST operations. Specific governance, implementation plans, and costs models are being developed and reviewed in response to formal NSF guidance issued in September 2016. NCOA would be an FFRDC sponsored by NSF and comprised of the programmatic elements contained within NOAO, Gemini, and future LSST operations; there would be sharing of resources, skills, and capabilities across the observatory facilities; people would be centrally managed and field deployed as needed in a classic matrix organizational structure; and there would be well-defined lines of authority and responsibility to execute the major programs and projects. Some of the key features of NCOA are: (1) NCOA will enable and support scientific discovery and leadership as a coordinated, community-oriented science and technology resource; (2) NCOA will develop, operate, maintain, and modernize key research facilities and systems; (3) NCOA will recruit and retain a high-value professional, scientific and technical workforce to operate current programs and innovate for the future; (4) NCOA will support collaborative public outreach, engagement and education to prepare the next generation of researchers and to enhance pubic awareness; and (5) NCOA will be a well-respected national OIR astronomy entity to lead, implement and sustain collaborations and partnerships. The model for NCOA is a classic matrix organization with what AURA is calling "Delivery Organizations," and "Support Organizations." The Delivery Organizations are basically the programs (LSST, Gemini, Four-Meter (NOAO), and Community Science). The Support Organizations would be service groups such as Science Operations, Data Operations, Engineering Operations, and Business Operations. Both Program and Service Group leaders would report to a NCOA Director. Programs would each have a well-defined funding stream often from multiple sources, and would use funding to procure resources and products from the Services Groups to accomplish the work and create deliverables. Services Groups would have personnel in multiple locations. The matrix structure enables a shifting of resources to address urgent/critical but temporary needs and facilitates the sharing of resources and skills across multiple facilities. All of the programs would be accountable to AURA through the NCOA Director and to external partners and stakeholders. The model is tailored to work within the external governance and partnership agreements and oversight mechanisms already in place. The goal is to have the final NCOA Plan to NSF by June 30, 2017 with reviews and approvals to be scheduled thereafter; NCOA operations are to begin October 2018.

William Smith commented that the proposed plan looks good and huge progress has been made. He felt that the AAAC should endorse the plan. He asked where the Directorate would operate in the cooperative agreement structure. Vernon Pankonin indicated that there would be an overall cooperative agreement acting as the governing vehicle. Cooperative agreements themselves do not contain any funding; all funds are issued through cooperative support agreements. NSF would use the structure that is in place today for NOAO but modify it so that the NCOA cooperative agreement would have the Directorate and the Directorate would be funded through one of the cooperative support agreements.

David Hogg asked where software development fit into the plan; software is essential to all of the service groups and programs. It would be much easier for all of the groups to operate under the plan if there were coherent software groups. Dr Lehr replied that software was one of the earliest issues identified as being a challenge, not because of the matrix structure, but because bringing in various software development and software groups into some coherent role can be very difficult; software does live in the programs and

the services groups. One of the earliest working groups assigned even before the Directors had agreed on a matrix structure was to look at software implementation and development. It is critical to the success of NCOA.

Rachel Mandelbaum asked what the timeframe was for the integration process and how the NCOA structure fits into LSST milestones like commissioning, etc. Dr Lehr replied that the intent is for NCOA to be stood up as a formal organization at the start of LSST operations. There is a period before that when AURA will be developing, planning and reviewing the structures with a formal approval process. Some implementation and some transition will occur before the start date at the beginning of FY2019, and there will be some continuing transition implementation that will occur during the first couple or several years of NCOA. NCOA is being planned and developed in collaboration with NSF and the Programs so that those milestones are intertwined: LSST development and NCOA development are being done coherently.

Vern Pankonin indicated that NCOA will begin formal operations at the start of LSST operations in October 2018. AURA will provide the final NCOA implementation plan to NSF by June 30, 2017; the LSST Operations proposal is due around the same time. NSF will take ~6-9 months to review and prepare a package for National Science Board (NSB) approval.

Paul Hertz provided an update on NASA activities. The FY2016 appropriation and FY2017 continuing resolution and the President's Budget Request (PBR) provide funding for NASA astrophysics to continue its programs, missions, projects, research, and technology. The total funding for the Astrophysics Division (including the James Webb Space Telescope (JWST), but excluding STEM) remains at ~$1.35B. This fully funds JWST for an October 2018 launch, funds Wide Field Infrared Survey Telescope (WFIRST) formulation (new start), Explorers mission development, increased funding for R&A, and new suborbital capabilities. The Astrophysics Division is awaiting FY2018 budget guidance from the new Administration. The operating missions continue to generate important and compelling science results, and new missions are under development for the future. Progress is being made toward the recommendations made in the 2010 Decadal Survey.

Since 2010, proposal numbers have grown faster than funding, so selection rates have fallen. NASA received fewer proposals for 2016 because there was no ATP-15 competition; 2017 funding data is incomplete. The Astrophysics Theory Program (ATP) selection rates have been <20% for the past decade, which puts an increased burden on proposers and reviewers. Beginning with the ROSES-2017 announcement, ATP proposals will be solicited every other year; success rates are likely to increase to ~30%. The Theoretical and Computational Astrophysics Network (TCAN) program supports coordinated efforts in fundamental theory and computational techniques and aims to unite researchers in collaborative networks that cross institutional and geographical divides. NASA expects to issue a call for proposals for TCAN with a deadline in early CY 2018.

The Astrophysics Division has several fellowship programs, among them the Nancy Grace Roman Technology Fellowship, which gives early career researchers the opportunity to develop the skills necessary to lead astrophysics flight instrument development projects, including suborbital investigations. Starting in FY2018, a fraction of the Postdoc Fellowship budget will be re-allocated to community grants in order to restore the balance of dollars between research grants and postdoc fellowships which has changed from a ratio of 10:1 to 6:1 over the last decade; there will thus be a reduction in the total number of fellowships. There is a large overlap in applications to the Hubble, Einstein and Sagan fellowship programs; there is an effort to combine the application and review processes for these three programs into a single application and review. Such changes do not alter the current balance or the mix of science topics within the overall Postdoc Fellowship program.

The FY 2017 President's Budget Request (PBR) for NASA Astrophysics submitted to Congress on February 9, 2016, included $757 million for Astrophysics and $569 million for JWST. Both the House and Senate appropriations committees marked up the FY2017 NASA budget request. All NASA astrophysics projects and activities continue as planned under the current continuing resolution.

NASA is initiating large and medium mission concept studies as input for the 2020 Decadal Survey. NASA has appointed Science and Technology Development Teams and initiated four large mission concept studies. The teams are planning for quarterly face-to-face meetings in FY2017. NASA is also soliciting mission concept ideas for medium-sized missions as part of community preparations for the 2020 Decadal. A solicitation for mission concept proposals was issued as an amendment to ROSES-16. Proposals are due in November with a selection targeted for February 2017. NASA will submit final reports and the results of the NASA cost assessment to the 2020 Decadal Survey Committee.

JWST remains on track for an October 2018 launch. The program remains within the replan budget. The project is concluding the manufacturing phase and is transitioning into integration and test. The first proposal opportunities are this year; early release science proposals are due August 18. A call for Guest Observer (GO) Cycle 1 proposals will be released in November 2017 with proposals due in March 2018. WFIRST is working toward a Systems Requirements Review in June 2017 and the start of Phase B in October 2017. WFIRST does not have a star-shade but NASA is studying this option for the next Decadal Survey's consideration.

The Science Mission Directorate STEM science activation efforts emphasize NASA's unique assets. The Divisions are responsible for science content datasets, infrastructure, tools, subject matter experts selections, and enabling flight opportunities.

Glen Crawford gave an update on DOE activities. The FY 2017 High Energy Physics (HEP) budget ($818M) aims to continue the successful P5 implementation. HEP is investing in a portfolio of high-priority projects at small, medium, and large cost scales. The PBR is carefully balanced between support for projects ($212M), facility operations ($252M), and scientific research ($354M) in order to produce scientific results.

The FY 2017 PBR includes $126.1M for the Cosmic Frontiers program. Through ground-based telescopes, space missions, and deep underground detectors, research at the cosmic frontier aims to explore dark energy and dark matter. Program thrusts include the study of the nature of dark energy, direct detection searches for dark matter particles, cosmic-ray and gamma-ray studies, the Cosmic Microwave Background (CMB), and computational cosmology. Related efforts funded by other programs in HEP include theory and detector development. Currently the Dark Energy program consists of the Dark Energy Survey (DES), LSST (camera), and DESI. For dark matter detection, several third-generation experiments are underway. CMB experiments are supported as part of the core particle physics program. HEP has research-only activities on Euclid, WFIRST, and supernovae surveys.

HEP has started Cosmic Visions groups to allow interactions with small HEP community groups. There are groups for CMB, dark energy, and dark matter direct detection. Any HEP-funded research and development and technology plans need to be in the context of the large non-HEP and global community.

A Tri-Agency/Tri-Project Group meets monthly to discuss DOE/NASA/NSF cooperation on Euclid/LSST/WFIRST, in particular Joint Data Processing and Joint Simulations. NSF, NASA, and DOE talk regularly about program planning, overlaps, and any issues that might arise in interagency projects. Agency coordination and oversight exists for many joint projects, such as DES, LSST, DESI, Veritas, HAWC, and SuperCDMS. DOE/HEP is making country-level agreements for science partnerships. The

Astro-Particle International Forum is now being hosted by the Kavli Institute for Particle Astrophysics and Cosmology (KIPAC) at Stanford University; Roger Blandford is the chair.

DOE is planning for a CMB-Stage 4 (CMB-S4) experiment, which was a P5 recommendation. NSF and DOE presented a plan to the AAAC in October 2016 for a Concept Definition Taskforce to carry out a study. Charles Lawrence (Jet Propulsion Lab, JPL) is the chair of the Task Force; the group has had several telecons and will meet face-to-face on January 29-30.

Charles Lawrence (JPL), chair of the CMB-S4 Task Force, provided an update on the group's activities. The Conceptual Design Team (CDT) was asked to develop a concept for implementing a ground-based CMB-S4 experiment. The CDT will take as input the community CMB-S4 Science Book and any further community information and will consider the global landscape of CMB experiments. The CDT will provide a report on the Science and Measurement Requirements to the AAAC by June 2017 and a final report to the Committee by October 2017 for consideration; the reports will be discussed and approved by the AAAC before formal transmittal to the agencies. The CDT is a continuation of the S4 work, not a replacement; the Agencies have established methods and routes for accepting input and advice from the science community. A lot of good work has been on measurement requirements, but simulations of foreground removal and instrument performance have not included foreground model uncertainties and residual instrumental systematics at the necessary ~10nK level. The group is making good progress on a first pass for the science requirements and organizing simulations.

Denise Caldwell gave an update on astrophysics activities supported by the NSF Physics Division (PHY). Of the division's five Perspectives on the Frontier of Physics, the "Origin and Structure of the Universe (star formation and creation of the elements, dark matter and dark energy, modeling of black holes, gravitational waves)," overlaps considerably with AST. One of NSF's Big Ideas, "*Windows on the Universe*", is already supported by multiple programs and facilities funded by PHY. PHY has also entered into partnerships with other agencies such as DOE, as well as international collaborations.

LIGO is currently in its second scientific observing run after the Advanced LIGO upgrade. The observations began the first week of December 2016 and will continue during spring 2017. LIGO sensitivity is expected to be 10% to 30% greater than the first run (1.3 to 2.2 increase in event rate). The Virgo operation is planned to overlap with LIGO in spring 2017. Virgo's sensitivity is to be established.

The newest searches for weakly interacting massive particles (WIMPS) have come up empty-handed. First, an underground detector in South Dakota called the Large Underground Xenon detector failed to detect any WIMPS. Then, IceCube ruled out a fourth type of neutrino and dark matter contender. PHY is looking to support the search for low mass Dark Matter and is funding projects searching in the region for masses < 1 MeV.

In early January, PHY hosted a workshop (co-funded by AST) to celebrate 20 years of the NSF/DOE Partnership in Basic Plasma Science and Engineering. There were talks and presentations on laboratory astrophysics, cosmic rays, and particle acceleration. Workshop panel discussions referenced the desire of the community for the NSF/DOE partnership to better coordinate support for plasma astrophysics research with NASA. The Plasma Physics program is looking forward to contributing to the "Windows on the Universe" effort.

James Green provided a status report on activities in the NASA Planetary Science Division. The Planetary Science Division has five main objectives: (1) demonstrate progress in advancing the understanding of how the chemical and physical processes in the Solar System operate, interact, and evolve; (2) demonstrate progress in exploring and observing the objects in the Solar System to understand how they formed and evolve; (3) demonstrate progress in exploring and finding locations where life could

have existed or could exist today; (4) demonstrate progress in improving our understanding of the origin and evolution of life on Earth to guide the search for life elsewhere; and (5) demonstrate progress in identifying and characterizing objects in the Solar System that pose threats to Earth or offer resources for human exploration.

Jason Rhodes provided a report on Euclid/LSST/WFIRST coordination activities. All three projects are moving forward toward the onset of operations on similar timescales. While there is strong overlap in the science planned for these three facilities, their designs are highly complementary. A combined analysis of the data from all three will provide a significant enhancement in scientific return; this will probably require joint processing at the pixel level. This joint analysis is outside the current scope of all three projects so will require some additional funding. There is a Tri-Agency, Tri-Project Working Group to explore this option; the initial reports from the technical subgroups will appear this Spring. LSST/Euclid coordination is being done at the project level. Both projects are working to define the scientific and technical benefits of coordination; both projects have data they do not want to share immediately without safeguarding their core science. LSST/WFIRST coordination is also being done at the project level. WFIRST data have no proprietary period so this simplifies the data rights issue. First steps in coordination are cosmology-based but other science areas are being considered. There was a WFIRST/LSST workshop in September 2016 where science and data processing synergies were discussed; the workshop had a cosmology focus but future meetings will branch out further.

Recently, a data sharing experiment was carried out and showcased at the International Conference for High Performance Computing, Networking, Storage and Analysis. Data from a large simulation run at one supercomputing facility were moved to a different facility for longer term hosting and storage. Large simulations are being produced by a number of groups involved in LSST, WFIRST, and Euclid. Currently, there are also difficulties with long-term storage of very large datasets because appropriate policies with supercomputing facilities are not in place. In order to ensure that valuable data are not being deleted, it would be beneficial to have a facility that can both store and host these Level 1 and 2 cosmological simulation data, with staff that could set up and maintain an efficient database for serving the data. There are very preliminary discussions of a possible arrangement where simulations are run using predominantly DOE supercomputing facilities and the data are then stored and hosted at a NASA facility; the goal would be for all simulations hosted by this facility to be fully public. Sharing simulations and computing resources makes sense since high performance computing infrastructure is expensive; open access to simulations makes scientific sense. A Tri-Agency Cosmological Simulations Task Force is being set up to focus on common infrastructure, base cosmological simulations, the investigation of systematic effects, and large simulation campaigns.

The Committee spent some time discussing report writing and planning for the annual report. The Vice Chair made writing assignments to all of the Committee members. The members were encouraged to read past reports as examples of what had been written previously on some of the topics that were discussed in the morning session such as the decadal surveys, EPO activities, the health of the profession, proposal success rates, collaborations between the Agencies, etc.

MEETING ADJOURNED AT 5:00 PM, 26 January 2017
MEETING RECONVENED AT 9:00 AM, 27 January 2017

The Committee spent most of the morning discussing the annual report and the different sections of the report. The Vice Chair provided a due date of February 17 for the first drafts of the different assigned sections. The Chair and Vice Chair will integrate the sections and have them ready for discussion at the February telecon.

Steve Ritz provided an update on the Decadal Survey planning activities. The Committee on Astronomy

and Astrophysics (CAA) helps the National Academy of Sciences (NAS) and the Agencies think through relevant issues as they generate the statement of task, stimulate and gather community inputs in advance of the survey, and pave the way to the Survey. The CAA reports to the NAS Board on Physics and Astronomy (BPA) and the Space Studies Board (SSB). The CAA is in the pre-survey activities stage. They are looking at how to gather data on the State of the Profession and are discussing the content and timing of the science white papers solicitation. Completing the white papers prior to the start of the Survey will be valuable, with papers due before selection of Survey committee members; the CAA is starting on the draft call text, with community input being sought at various venues, including the 2018 AAS meeting. The CAA is considering the Cost and Technical Evaluation (CATE) process and possible changes for Astro2020. CATE has evolved considerably since the 2010 survey and an understanding of the process will be critical to ensure that the CATE results are accurate and fair. NAS is planning to hold a meeting of experts across disciplines about the CATE process this year. Initial discussions suggest that the scope and boundaries for *NWNH*/Astro2010 could be similarly optimal for Astro2020; some items to consider include ground-based gravitational wave astronomy, connections between exoplanets and astrobiology, the continued/increased importance of the international context, and the engagement of philanthropic organizations. The purpose of the Town Halls will be to engage the science community, share lessons learned from the Astro2010 survey, discuss the white paper call, and provide outreach to younger colleagues.

MEETING ADJOURNED AT 12:00 PM EST, 27 January 2017