

**National Council of Space Grant Directors Fall Meeting  
Washington, D.C.  
March 4–6, 2010**

Minutes submitted by Ed Duke, May 21, 2010

***Thursday, March 4, 2010***

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1. Welcome – ***Richard Berendzen***, Spring Meeting Host and Director, District of Columbia Space Grant Consortium

2. Call to Order and Introductions – ***Chris Koehler***, National Council Chair and Director, Colorado Space Grant Consortium

- Koehler called the meeting to order at 1:00 pm
- He thanked the District of Columbia Space Grant Consortium and acknowledged the Oregon Space Grant Consortium for the successful Fall Directors meeting in Portland
- New Space Grant personnel and guests were introduced by the audience:
  - In Iowa, Sugumaran Ramanathan will become the new Director effective April 1, 2010 (Bill Byrd retiring).
  - In Kentucky, Suzanne Smith is the new Director and Janet Lumpp is the new Associate Director.
  - Other consortia with new personnel include MT, FL, LA, WY, WI, MI, RI, WV, NH, and NV.
  - Sandy Thomas from the Institute for Broadening Participation announced that they had been selected by NASA to assist with developing minority participation.

3. Executive Committee Update – ***Chris Koehler***, Chair

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/11.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/11.pdf)

- Chris Koehler announced out that there are five vacancies coming up on the Executive Committee (includes Chair).
- He reviewed ongoing activities of the Executive Committee. These include calls from the Chair to Directors, electronic newsletters, monthly Executive Committee teleconferences, monthly teleconferences between the Chair and NASA Headquarters, and the Mission Directorates Working Groups.
- In addition, the Chair was invited by NASA Headquarters to speak about Space Grant at the NASA Industry-Education Forum (Dec. 3, 2009, at NASA HQ).
- Major concerns of the Executive Committee include:
  - Funding – Past, Present, and Future
  - No-cost extensions for FY2009 funds
  - Establishing awareness of Space Grant with the new NASA administration
  - Space Grant Internship Working Group
  - PPR feedback to NASA
  - Communications with NASA
  - Summer of Innovation Response

- He announced that the Executive Committee would be soliciting written input during the meeting on the following: “Over the next 5 years of Space Grant, what do you see as the top three issues or challenges that you would like to see addressed?” (one response per state)

4. Treasurer’s Report – **Peter Sukanek**, Treasurer and Director, Mississippi Space Grant Consortium

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/12.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/12.pdf)

Peter Sukanek summarized balances in the National Space Grant Foundation accounts as of the end of December 2009 (table below). Between June 30, 2009, and Dec. 31, 2009, the balance in the Endowment increased from \$4,855.46 to \$6,240.56, and the balance in the Expendable account increased from \$18,733.85 to \$23,062.83.

Treasurer’s Report

March 2010

ON DEPOSIT WITH NSGF

	ACTIVITY	PREVIOUS BALANCE (as of 30 Jun 09)	CURRENT AMOUNT (as of 31 Dec 09)
<b>Endowment</b>		<b>\$4,855.46</b>	
Income	Interest/Gifts		\$21.59
	Commissions		\$209.46
	Change in Market Value		\$1,154.05
Total Endowment			<b>\$6,240.56</b>
<b>Expendable</b>		<b>\$18,733.85</b>	
Income	Interest/Gifts		\$21.59
	Transition Meeting		(\$1,584.06)
	Residuals from Spring Meetings: 2007, 2008, 2009		\$6,000.00
	Fall 2009 Meeting		(\$108.55)
Total Expendable			<b>\$23,062.83</b>

5. Secretary’s Report – **Ed Duke**, Secretary and Director, South Dakota Space Grant Consortium

Minutes of the Fall 2009 (Portland, OR) Council Meeting were introduced and approved.

6. NASA Innovation and Technology Preliminary Planning – **Robert D. Braun**, NASA Chief Technologist

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/10.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/10.pdf)

(Introduction by Stephen Ruffin, Georgia Space Grant Consortium)

Braun, who is a former LARSS intern, holds the newly-established position of NASA Chief Technologist.

The new NASA Administration plan features a greater focus on innovation, partnerships with universities, and international partnerships. This new direction reflects recommendations of several panels in recent years (e.g., Augustine and National Research Council Reports) that NASA has become too mission-oriented and has lost its lead in technology innovation. The new direction focuses on investing in the technology: “technology driven.”

The goals of the new NASA Innovation Initiative are:

1. Revitalize NASA as a preeminent R&D organization through significant investment in longer term technical or process innovations
2. Encourage innovative application of NASA capabilities to address broader national needs such as energy, weather and climate, Earth science, health and wellness, national security, and STEM education
3. Stimulate a vibrant commercial space sector through helping to create new types of engagement, creation of new markets, and investments in future technologies
4. Generate excitement about NASA’s work by investing in a large number of highly creative activities with potential for disruptive breakthroughs
5. Provide exciting hands-on work for students and new employees

Some of the attributes of a Reinvigorated Innovation and Technology Program include:

1. ISS Utilization Extended, Likely to 2020 or Beyond
  - Designation of ISS as a National Laboratory for use by a variety of government and non-government organizations
  - Implement priorities of Life and Physical Sciences community
2. Early Stage Innovation and Game-Changing Technology
  - An emphasis on non-mission-focused innovation and technology development
  - Comparable to DARPA (Defense Advanced Research Projects Agency) concept
  - Includes Space Technology Graduate Fellowship program (100-500 fellowships planned)
3. Expanded Commercial Sector Engagement
  - NACA-like (National Advisory Committee for Aeronautics) approach to developing investment strategy and partnerships to open long-term commercial markets
4. NASA Innovation Applied to Broader National Needs
  - Leverage NASA capabilities and technology for applications in energy, weather and climate, Earth science, health and wellness, and National security
5. Technology Innovation for Flexible Human Exploration Capabilities
  - Provide critical capabilities needed to implement various options examined by the Augustine Committee to extend human presence beyond low Earth orbit
  - Driven more by technology development, less by timetables
6. Precursor Demonstrations and Flight Testing
  - Demonstrate prototype systems and key capabilities on international robotic missions to reduce risk for future human exploration and more ambitious science missions

New Exploration Research & Development Activities:

1. Exploration Technology and Demonstrations

- *Develop and demonstrate technologies to reduce costs and expand capabilities for future exploration*
- 2. Heavy-Lift and Propulsion Technology
  - *Research and development of new cost-effective propulsion systems, engines, LV materials, etc.*
- 3. Exploration Precursor Robotic Missions
  - *Scout exploration targets, identify hazards and resources for human visitation and habitation*

Specific ESMD Flagship Technology Demonstrations and Approach:

1. Evaluation underway of highest leverage demonstrations; Mars destination is a driving case for high leverage demonstration and technology
2. First three primary technology targets for single or combined missions to include:
  - In-orbit propellant transfer and storage
  - Lightweight/inflatable modules
  - Automated/autonomous rendezvous and docking
3. Fourth flight program such as
  - Aerocapture/entry, descent and landing
  - Advanced life support
  - Advanced in-space propulsion (ion/plasma, etc.)
4. Initiate four technology demonstrations in FY2011
5. Follow-on demonstrations informed by emerging technologies
6. Identify potential partnerships:
  - Academia
  - NASA Mission Directorates, DARPA, DOD, DOE, NOAA, NSF, others
  - Industry: Aerospace, non-Aerospace
  - International Partners

Questions from the audience:

*Q:* What will be the role for nuclear propulsion? (Strauss)

*A:* Approximately 10 different technologies are being reviewed for in-space propulsion, including nuclear-thermal.

*Q:* Will Space Grant be a partner in this new direction? (Sandy)

*A:* No specific decision on that yet.

*Q:* Is there a space elevator in the plan? (Henry)

*A:* Not sure.

*Q:* Members of Congress seem worried that the new NASA goals and timelines are vague. (Guzik)

*A:* The approach in the past was not sustainable. NASA is preparing responses to Congress to explain the details of the new approach.

7. NASA Education Updates – **Joyce Winterton**, NASA Assistant Administrator for Education (presentation slides not available)

Dr. Winterton provided an overview of Administration-level education priorities and the role of NASA and Space Grant

- STEM education is a high priority
  - innovative approaches
  - inspiring students
  - alignment with Department of Education Race-to-the-Top program
- FY2011 budget opportunities
  - Higher Education launch opportunities
  - Global Climate Change education
  - K-12 STEM Education
- Summer of Innovation
  - idea first introduced in September 2009
  - pilot program planned for summer 2010
  - plan to continue program in 2011 and 2012
  - represents NASA contribution to Race-to-the-Top strategy
- John Holdren, Director of the Office of Science and Technology Policy, is very supportive of STEM education
- NASA is actively involved in the White House Council on Women and Girls
- NASA Explorer School (NES) program currently being redesigned (additional detail in Diane DeTroye's Program Update)
- Emphasized that Space Grant programs such as *RockOn!* are excellent examples of the hands-on education continuum from K-12 through graduate level
- Educator Astronaut program includes Dottie Metcalf-Lindenburger (STS-131, scheduled launch April 5, 2010) and a pre-launch forum on "Women in Engineering and Robotics"
- Hubble 3D IMAX movie debuts March 9, 2010
- The FY2011 Office of Education budget includes \$27.7 million for Space Grant (19%), \$9.3 million for EPSCoR (6%), and \$27.2 million for MUREP (19%)
- New Directions and Priorities
  - increasing utilization of the International Space Station
  - private sector partnerships
  - critical technologies development
  - climate change research and education
  - aeronautics research
  - educational initiatives

8. Program Update – ***Diane DeTroye***, National Space Grant Program Director

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/1.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/1.pdf)

- Acknowledged Dave Masten (Masten Space Systems) who was in the audience.
- Introduced Headquarters Space Grant and EPSCoR staff.
- Acknowledged other NASA Headquarters staff in attendance: Jerry Hartman, Tony Springer, Robert Braun, Lisa Guerra, Alan Ladwig, Joyce Winterton
- Acknowledged NASA Center staff in attendance: Natalie Gore (ARC), Dave Rosage (GSFC), Linda Rodgers (JPL), Mark Severance (JSC ISS Education Project), Gloria Murphy and Susan Sawyer (KSC), and Frank Six (MSFC)
- She noted that six of the 10 Centers were represented.
- She reviewed 16 important activities of the Space Grant Headquarters office since the last Directors Meeting (Portland, OR, Oct. 22-24, 2009).

- She reviewed 14 important activities of the Space Grant consortia since the last Directors Meeting.
- She noted that the Summer of Innovation initiative was a passionate interest of Chief Administrator Bolden and that it was clear to the NASA administration that Space Grant was the only organization that could implement the program in the given timeframe.
- She summarized significant changes in the NASA Explorer Schools (NES) program:
  - NES will be open to all middle and high schools, regardless of geographic or demographic characteristics
  - There will be no application process; schools simply register to participate
  - NES will operate as a virtual campus offering 8-10 NASA content modules; it will use a variety of electronic media (blogs, wikis, webcasts) for teacher and student support
- She reviewed the 2010 Solicitation and problems with some of the responses from Space Grant consortia.
  - Proposals are currently being reviewed; expressed concern that some consortia have not successfully identified what is new about their 2010–2014 plan
  - These are NEW awards, not continuations or partial proposals
  - The proposal and budget must stand alone; should not be treated as a partial program
  - Too many consortia reference “on-going” or “continuing” projects, without describing them (again, the proposal must stand on its own)
  - Too many consortia treat the plan as part of a full program, not a stand-alone plan and budget
  - Too many consortia fail to cite the new priority areas that were in the solicitation; eight specific “Current Areas of Emphasis” were listed
  - In view of the problems above, some consortia may be required to submit revised proposals
- On the Horizon
  - Second increment of 2010 funding: The 2010 NASA operating plan has not been submitted to Congress. However, Space Grant consortia will be eligible to receive their second increment of 2010 funding as an augmentation. Consortia are advised to read the augmentation announcement carefully; augmentation proposals will be subject to review.
  - There will be a 2010 Consortium Development Competition for non-designated consortia; this provides the opportunity for a one-year augmentations. These awards bring the funding levels and number of jurisdictions into line with the Congressional language.
  - There will be new MUREP (Minority University Research and Education Program) solicitations.

Questions from the audience:

*Q:* Will the ESMD faculty programs be open to community college faculty?

*A:* Probably not; they are linked to senior engineering design, which is generally not an activity at community colleges. (Gloria Murphy)

*Q:* Can you comment on the NASA education budget request going from \$184M down to \$146M (FY2010 to FY2011)?

- A:* This is typically the situation. It is actually an artifact because much of the apparent difference will be made up through funding on congressionally-directed projects.
- Q:* Will Space Grant again be the primary entity for implementing Summer of Innovation in 2011 and 2012?
- A:* No, Summer of Innovation in 2011 and 2012 will be open to other organizations.
- Q:* Can you give an indication of when consortia will receive their 2010 funds? When will we know the timing? This is critical for funding students this summer.
- A:* Can't give a date at this time. Full funding will not be awarded until the augmentation proposals are submitted and reviewed.
- Q:* Will the 2010 augmentation proposals necessarily follow the review of the 2010-2014 proposals?
- A:* No, the solicitation for the augmentation proposals will be issued before then.
- Q:* With NASA's increased emphasis on international partnerships, will consortia be able to use their funds for international travel?
- A:* There is currently no prohibition on international travel; there is a limit of \$1,000 per year, and prior approval from the Space Grant Program Manager is required. The requirement that direct participants be U.S. citizens will not change.
- Q:* When will consortia know the outcome of their 2010 proposals?
- A:* As soon as possible.
- Q:* Is it possible that some consortia will have a funding gap between FY2009 and FY2010-2014 funding?
- A:* Space Grant Headquarters is doing everything possible to avoid that, but it may occur in some cases. Technically, there is no gap, because these are different awards: one ends and another begins. Also, there is a 90-day pre-award clause that allows awardees to spend up to 90 days prior to the grant start date.
- Q:* Who are the reviewers of the 2010-2014 Five-Year proposals?
- A:* Can't say.
- Q:* How many consortia submitted Summer of Innovation proposals?
- A:* Don't know. Those are handled by a different office.
- Q:* Does the Space Grant Office plan to try to reconcile the difference between the President's budget request (e.g., \$28.4M for FY2010) and the Congressional authorization (\$45.6M for FY2010)?
- A:* This difference has existed every year that she has been with the program (since 1998) with one exception. No plan was outlined to change this.
- Q:* Some consortia have awards that have already expired (they are in no-cost extensions). What about the annual start/renewal date for those consortia?
- A:* For consortia which have already passed their renewal date, it will probably not be possible to keep the old start dates and annual schedule.

9. Next-Gen Suborbital Vehicles – **Alan Stern**, Associate Vice President, Southwest Research Institute (Sponsored by Colorado Space Grant Consortium and New Mexico Space Grant Consortium)

(presentation slides not available)

(Introduction by Pat Hynes, New Mexico Space Grant Consortium)

In introducing the next two speakers, Pat Hynes emphasized the relationship between commercial space flight and student payload opportunities.

- Alan Stern is a former NASA Associate Administrator for the Science Mission Directorate.
- He predicted that suborbital spaceflight will have an impact comparable to that of the personal computer revolution that occurred 30 years ago.
- He reviewed the recent history of commercial spaceflight, noting five or six companies that are currently active in the field.
- He discussed important opportunities for scientific research:
  - Extended periods in micro-gravity
  - Access to the middle atmosphere (the “ignorosphere”)
  - Broader access in general:
    - a greater variety of experiments and equipment, including science-fair-type projects
    - a greater variety of personnel, including students and educators
- He predicted that at least 500 people will take suborbital flights each year, noting that in total only 500 people have been into space up to this point.

10. NASA’S Commercial Reusable Suborbital Research Program, STEM, and Inspiring the Next Generation – **Charles Miller**, Senior Advisor for Commercial Space (Sponsored by New Mexico Space Grant Consortium)

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/4.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/4.pdf)

(Introduction by Pat Hynes, New Mexico Space Grant Consortium)

- Miller is in the new Office of the Chief Technologist at NASA.
- CRuSR is part of the Administration’s new agenda for NASA. The basic idea is to catalyze and leverage commercial capabilities. The goal is to have reusable space vehicles for orbital as well as suborbital missions.
- The program has three components: technology development, science, and education. The education component has both college-level and K-12-level thrusts. Much of the focus will be at the K-12 level, because Administrator Bolden feels that kids are losing interest in STEM at the middle-school level.
- Experiments on current reusable vehicles cost about \$200,000, but the prices are coming down.
- Currently, the personal spaceflight industry serves as a motivator for development of reusable vehicles.
- CRuSR envisions placing 500 middle school and 500 high school payloads into space each year.

- This will help to develop in students the belief that living and working in space is a realistic opportunity for them: “*Communicate and enable a future where millions of American school children can credibly believe living, working and playing in space is part of their future.*”
- Under the plan, every college and technical school could afford to send experiments into space.
- The program will create a new set of challenges:
  - thousands of new schools in the program
  - new curriculum
  - reviewing and processing thousands of proposals
  - new training programs for teachers
  - maintaining new launch sites across the country
- The President’s budget for FY2011 has \$15 million for this program and a total of \$75 million over five years. He welcomed ideas on how Space Grant might be a partner in this program.

Questions from the audience:

*Q:* What is happening now? (Hoffman)

*A:* There is currently \$2.5 million in the FY2010 budget for activities at Ames.

*Q:* Why separate K-12 and higher education programs? College students work very effectively with K-12 students and teachers. (Wiskerschen)

*A:* It is partly based on different cost models: K-12 generally does not have any money for such programs, whereas higher education is more likely to have money to pay NASA to fly experiments.

*Q:* Might there be any funding to incentivize higher education to work with K-12 teachers? (Sandy)

*A:* NASA would be receptive to ideas from the Space Grant community on how to do that.

*Q:* Could you clarify the statement about “credibly living in space”? (Ruffin)

*A:* Partnerships with commercial space industry will lead to orbital reusables.

<p>11. Accessing Systems Engineering Curriculum and Resources – <b>Lisa Guerra</b>, NASA ESMD (Sponsored by District of Columbia Space Grant Consortium)</p>
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[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/13.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/13.pdf)

- Guerra worked at the University of Texas–Austin for the past three years to develop systems engineering courses in the Department of Aerospace Engineering.
- Courses include a 3 credit-hour class and a 1 credit-hour lab.
- The website for accessing these resources is <http://space.se.spacegrant.org>
- The website contains 27 modules that make up the core course. This provides a flexible structure, because each module is a stand-alone section.
- There is also a set of NASA failure reports so that students can access the systems engineering aspects of actual aerospace challenges.
- In 2010 four new modules will be added. These are based on ESMD Faculty Grants and should be posted by summer 2010.
- Also this summer, there will be a new graduate-level course on Fundamentals of Systems Engineering that is more broadly focused, not just on aerospace engineering.

- She emphasized that the teaching of systems engineering has become increasingly relevant, because today's students have more opportunities to design and build hardware, and systems engineering should be embedded in those processes.

## 12. National Hands-On Workshops

1. **Fathi Finaish**, Director, Missouri Space Grant Consortium  
[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/22.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/22.pdf)  
 (introduced by Philippe Geubelle)
  - Integration of Design and Hands-On Learning into Early Stages of Engineering Curriculum
  - June 17-19, 2010, Missouri University of Science and Technology (sponsored by the Great Midwest Space Grant Region)
  - The workshop is designed for managers, faculty and students from four-year colleges or community colleges with engineering programs. Attendees will design, test, and fly a radio-controlled aircraft according to specific requirements. Registration is \$975. For information or to register, go to: <http://web.mst.edu/~spaceg/>
  - The workshop will include two panel discussions, and the recommendations will be presented at future Space Grant meetings.
2. **Tom Filburn**, Director, Connecticut Space Grant Consortium
  - Weeklong Helicopter Training for Undergraduate Students.
  - The program runs Aug. 1–6, 2010, at Central Connecticut State University.
3. **Chris Koehler**, Director, Colorado Space Grant Consortium  
[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/17.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/17.pdf)
  - *RockOn!* 2010 Workshop. Collaboration between Colorado and Virginia Space Grants, NASA HQ, and NASA Wallops Flight Facility.
  - *RockOn!* 2010 will be June 19–24 at the NASA Wallops Flight Facility. The registration fee is \$1699. In the future, additional payload canisters will be available at a cost of \$12,000 per 20 pound canister, or \$25,000-\$35,000 for a 50 pound canister.
  - More information at: <http://spacegrant.colorado.edu/rockon>
4. **John Gregory**, Director, Alabama Space Grant Consortium
  - University Student Launch Initiative. Students design and build a rocket and payload, which they bring to the competition.
  - There are about 20 teams registered for this year's competition, which is April 17-18, 2010, at NASA Marshall Space Flight Center. More information at: <http://education.msfc.nasa.gov/usli>
  - Two workshops will be held in summer 2010 to help teams prepare for the next competition. These will be in Huntsville, Alabama, in July and at Utah State University (Logan, UT) in August. In the future there may be an additional “experimental rocket” workshop and competition held in collaboration with the Utah Space Grant Consortium.
5. **Frank Six**, NASA Marshall Space Flight Center
  - The Great Moonbuggy Race will be held at Marshall Space Flight Center in April. This year there are 106 teams registered.

13. ESMD Space Grant 2010 Solicitations – *Gloria Murphy* and *Susan Sawyer*, NASA ESMD  
[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/7.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/7.pdf)

Gloria Murphy summarized changes in the way the ESMD Space Grant programs are being administered. Rather than executing Cooperative Agreements with each consortium, ESMD will make only two awards. The organizations that receive the awards will make disbursements to individual consortia or students using an expedited process.

- The first Cooperative Agreement Notice (CAN) was released Feb. 26, 2010. The organization selected will receive funding of \$450,000 for the first year, with the possibility of renewal for two additional years at \$675,000 per year. Funds will be used to support the following ESMD projects and participants:
  - Consortia or individuals will submit short (1-page) applications for senior design or internship projects
  - NASA determines which projects will be funded
  - The organization administering the Cooperative Agreement will make payments.
  - Internships will be with industry partners (not with NASA Centers)
  - Additional opportunities in years 2 and 3 will include Competition Scholarships (19), Faculty Fellowships (5), Course Development (1), and Faculty Workshops (45)
- The second part of the program will be implemented under the Innovative Opportunity Cooperative Agreement Notice scheduled for release in March 2010.
  - Open to Space Grant affiliates only
  - There will be between one and three awards. Total funding for year 1 will be \$75,000, and there is a possibility that projects may receive funding for two additional years at \$75,000 per year.
  - Innovative Opportunity projects must promote participation of underserved and underrepresented students in STEM and address one or more of the PART Outcome 1 measures
- She noted that 29 teams are entered in the inaugural Lunabotics Mining Competition, which will be held May 27-28, 2010, at KSC.

14. Mission Directorate Working Group Chair Reports

Exploration Systems Mission Directorate

*Wally Fowler* presented the summary.

- The group recommended Wally Fowler and Raji Patel as co-chairs.
- Jerry Hartman (NASA ESMD) pointed out the importance of ESMD-related jobs in industry. He also stressed the importance of working with the NASA Centers.
- Gloria Murphy suggested getting more involvement of community colleges and technical schools.
- There was discussion of getting Space Grant students more involved in the “Desert RATS” (Research and Technology Studies) competition.

Science Mission Directorate

*Terry Teays* presented the summary.

- The group recommended Terry Teays and Mitch Colgan as co-chairs. Paul Harderson stepped down because of other commitments.

- Stephanie Stockman (NASA Science E/PO Lead) briefed the group on E/PO opportunities within SMD.
- There has been progress in developing a Space Grant Faculty-Student Fellowship program with SMD missions.
- There will be a limited version of this program in summer 2010 with the Hubble mission and there are plans for a broader pilot program in summer 2011.

Aeronautics Research Mission Directorate

**Stephen Ruffin** presented the summary.

- The group recommended Stephen Ruffin and Scott Tarry as co-chairs.
- The group has entered into discussions with Tony Springer (NASA Aeronautics E/PO Lead).
- It was noted that NASA is considering establishing (or re-establishing) an Aeronautics Academy program.
- It was noted that “green” aeronautics is national priority.
- There are many ARMD-related graduate and undergraduate scholarships available.
- The Working Group is striving to develop a Space Grant ARMD faculty and student internship program similar to the Space Grant ESMD model.

Space Operations Mission Directorate

**Jeff Hoffman** presented the summary.

- The group recommended Jeff Hoffman and Tom Filburn as co-chairs.
- The group discussed the appropriate affiliation for suborbital missions and decided to consider these missions as part of SOMD.
- Mark Severance (NASA JSC) briefed the group on opportunities for student experiments on ISS.
- The group discussed uncertainties regarding the future of research on ISS, e.g., life science research programs have been cut back.

15. Nominating Committee Update and Elections – **Bill Byrd** (IASGC), Committee Chair  
(see item 17, below, for results)

16. Lunch and Keynote Speakers (Student presentations from the Kentucky, West Virginia, Michigan, and Virginia, and Colorado Space Grant programs)

Student Partnership for Advancement of Cosmic Exploration (SPACE) – **Kerri Phillips** and **Kyle Phillips**, West Virginia Space Grant Consortium

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/20.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/20.pdf)

- The organization serves as a launch pad for future leaders in space exploration.
- The organization has strategies for:
  - public and student outreach
  - curriculum development
  - student financial support
  - research development
  - professional student experiences
- The group offered to help organize local SPACE chapters at other institutions.

Team Biology at the Community College of Aurora (CO) – *Shellene Wright* and *Stacy Jonet*, Colorado Space Grant Consortium

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/18.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/18.pdf)

- The project is funded under a Space Grant Minority-Serving Institution grant.
- The team is studying genetic mutations in a strain of *E. coli* after exposure to the space environment on balloon launches.

Kentucky Space – *Daniel Erb* and *Zach Jacobs*, Kentucky Space Grant Consortium

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/16.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/16.pdf)

- The students described a variety of projects including balloon, suborbital, and orbital missions.
  - Suborbital CubeSat experiment using Wallops launch.
  - Orbital experiment (KySat-1) using KSC launch scheduled for Nov. 22, 2010.
  - NanoRacks and CubeLabs for ISS scheduled for delivery on STS-131 in April 2010. Collaborating with Marshall Space Flight Center for support.

Combining Research and Education in Space Propulsion – *Tom Liu*, Michigan Space Grant Consortium

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/9.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/9.pdf)

- Described work of a team of undergraduates on micropropulsion for NanoSats. Tests were conducted in microgravity on a NASA C-9B.

## 17. Election Results

Bill Byrd presented the results of Council Elections:

- Chris Koehler was re-elected as Council Chair
- Chris Brown, Alec Gallimore, John Gregory, and Yervant Terzian were elected to the Executive Committee
- Fathi Finaish and Luke Flynn were elected to the Nominating Committee

## 18. International Space Station National Lab Education Project – *Mark Severance*, NASA Johnson Space Center

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/3.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/3.pdf)

(Introduction by Diane DeTroye)

- Congress has ordered that the U.S. segment of ISS be designated a National Laboratory.
- Lab activities must be open to partners from industry and other federal agencies, and activities must include education.
- Funding for these activities may be shared with NASA or may be up to 100% from the partner. The overall target is that funding will be approximately 60% from partners and 40% from NASA.
- The goal is to create lifelong STEM learning opportunities, from K-12 through post-doc levels and beyond.
- General categories of planned activities include:

- experiments using onboard resources (no upmass)
- experiments flown to ISS (upmass required)
- ground-based activities focused on ISS resources
- flight-following activities to analyze ISS systems
- The Space Grant network is an excellent system for getting all 52 jurisdictions involved in educational programs on ISS.

19. Update on 2010 GSFC Summer Interns – **Dave Rosage**, NASA Goddard Space Flight Center  
[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/15.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/15.pdf)

Dave Rosage described new procedures for Space Grant internships at GSFC.

- Students now apply to specific projects that are selected by GSFC mentors.
- Faculty are encouraged to nominate students, especially minorities.
- For the summer 2010 program there are 679 applicants from 47 states.
- GSFC will contact Space Grants to determine how many interns each consortium will support at \$6000 per student.

*Discussion* – Under this process, consortia do not get to review the students’ applications. Directors expressed concern that they need to know which students they are supporting. Diane DeTroye also suggested that this was important, so that consortia could apply their specific criteria in the selection process.

20. Space Grant Internship Working Group Update – **Barrett Caldwell**, Working Group Chair and Director, Indiana Space Grant and **Diane DeTroye**, National Space Grant Program Director

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/27.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/27.pdf)

Caldwell described progress on a one-stop portal for student applications for NASA internships and related NASA fellowship and scholarship opportunities.

- The system is being called the Student OnLine Application for Recruiting (SOLAR).
- Students (high school, undergraduate, graduate) will enter their data one time for all NASA opportunities. Students select up to 15 specific programs that they wish to apply to.
- There will be separate data entry points for NASA mentors, NASA Centers, and the broker-facilitator organization that will manage the SOLAR program.
- There is currently no link back to the students’ Space Grant program for review and approval, but that capability will be added.
- The system may be expanded to include industry internships at some future date.
- The system should be operational by summer 2011.

21. Space News Student Outreach Program – **Bill Klanke**, Vice President and General Manager of *Space News* (Sponsored by New Mexico Space Grant Consortium)

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/6.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/6.pdf)

(Introduction by Pat Hynes, New Mexico Space Grant Consortium)

Bill Klanke provided an overview of the *Space News* Student Outreach Program.

- *Space News* publishes a weekly newspaper in paper and digital format, an electronic newsletter, and maintains the website SpaceNews.com
- *Space News* would like to work with Space Grant directors to provide qualified students with free subscriptions to the digital version of *Space News*, the electronic newsletter, and access to SpaceNews.com
- Directors will be asked to distribute *Space News* verification cards to students who qualify. Student subscriptions are on an annual basis and can be renewed as long as students qualify.

22. Re-engineering the K-12 Curriculum – **Ioannis Miaoulis**, National Center for Technology Literacy, Museum of Science, Boston (Sponsored by Massachusetts Space Grant Consortium)

(oral presentation, no slides)

(Introduction by Jeff Hoffman, Massachusetts Space Grant Consortium)

Miaoulis contrasted the treatment of natural sciences in the U.S. education system with that of engineering and technology. He argued that education focuses disproportionately on the natural world (e.g., volcanoes and dinosaurs) when most students are actually immersed in the “designed” or “human-made” world (i.e., technology). He stressed that the engineering curriculum serves to tie together basic math and science courses in order to solve problems—it makes math and science relevant. Unfortunately, at the college level, most students transfer out of engineering programs in the first year or two *before they even get to the true engineering courses*. He proposed early exposure to introductory engineering courses that are engaging and relevant as a way to improve retention.

- The goals of the National Center for Technology Literacy (NCTL) are to:
  1. Advocate for K-12 engineering curriculum standards on a state-by-state basis.
  2. Advocate for standardized national tests (similar to NAEP) for engineering and technology.
  3. Promote engineering curriculum development for K-12 (especially middle school). NCTL would like to partner with Space Grants in K-12 educator professional development.
- NCTL programs aim to attract and retain more students in engineering and to bring about better public awareness of the role of technology and engineering in our world.
- To learn more about NCTL, contact the Massachusetts Space Grant or go to [www.nctl.org](http://www.nctl.org)

23. The Galileo Teacher Training Program – **Jim Manning**, Astronomical Society of the Pacific (Sponsored by California Space Grant Consortium)

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/4.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/4.pdf)

The goal of the Galileo Teacher Training Program (GTTP) is to develop and present workshops using Galileo’s iconic observations to teach the process of science, problem-solving, and collaboration in an inquiry-based framework, resulting in a teacher professional development opportunity for modeling science in the classroom.

- The program currently incorporates International Year of Astronomy and NASA-related content and activities, including:
  - Galileoscope

- Dark Skies Awareness
- NASA content/materials
- NASA Lunar Science Institute content/activities (Ames)
- A Pilot Workshop was held at the Astronomical Society of the Pacific Meeting, Millbrae, CA, in September 2009. It included:
  - Galileo background/Jupiter moons activity
  - Lunar phases/constellations/size & scale activities
  - Astronomy/hands-on resources/pedagogy
  - Galileoscope/Dark Skies activities
- A second workshop will be held at Northrop Grumman Aerospace Systems, Redondo Beach, CA, on March 12-13, 2010. It will cover:
  - Galileo/Jupiter moons/Venus phases activities
  - Lunar phases/size and scale activities
  - James Webb Space Telescope tour/Astronomy resources
  - Galileoscope activities
- The web site for the program is [www.gttpusa.org](http://www.gttpusa.org). The web site will:
  - serve as a repository of GTTP resources and activities
  - include a calendar of upcoming GTTP workshops
  - help to develop a community of practice among graduates
  - provide links to other directories of formal and informal resources including NASA and IYA, and perhaps Space Grant projects
- Partnership with the GTTP program directly supports many Space Grant objectives in formal and informal education: it provides hands-on activities for participants, and it provides resources and training for K-12 teachers.
- He cited several examples of state-based Space Grant projects that could be used to implement the GTTP program:
  - Ohio – Project ASTRO, pairing classroom teachers and astronomers to improve science teaching
  - Minnesota – Project STEP, modeled on Project ASTRO for science
  - Montana – Space Public Outreach Team, through which university students provide presentations on astronomy and NASA missions to K-12 schools around the state

24. Consortium Coordination Session – NASA Headquarters, Directors, and Coordinators:

***Diane DeTroye*** (NASA HQ), ***Katie Pruzan*** (Valador), ***Kevin Sadeghian*** (Valador)

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/2.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/2.pdf)

The focus of the presentation was the Office of Education Performance Measurement (OEPM) system. The basic structure of the new system was described. The deadline for reporting FY2009 data has not yet been determined. Draft forms will be distributed in March so that consortia know the types of data that must be collected.

*Discussion*

- Consortia will be able to enter data throughout the year, but there will be a date beyond which you can't change information for a particular year.
- The development team is still working on how to handle reporting on projects that span more than one year and follow-up data such as publications which typically show up well after the project year.

- When complete, the system will conduct longitudinal tracking of new students who are registered in the system.
- Training on the system will be conducted in segments as different components are activated. Training will utilize WebEx and conference calls.
- The system will be used for all Office of Education programs.
- Consortia must keep their FY2009 and FY2010 results separate during the carry-over period (no-cost extension) when there will be two distinct grants in place.

25. Fall 2010 National Meeting – **Terry Shehata**, Director, Maine Space Grant Consortium

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/14.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/14.pdf)

The Fall 2010 Directors Meeting will be at the Portland Holiday Inn by the Bay, Portland, ME, Oct. 14–16, 2010.

26. Fall 2011 National Meeting – **Sharon Brandt**, Program Manager, Wisconsin Space Grant Consortium

The Fall 2011 Directors Meeting will be in Green Bay, WI, Sept. 21-23, 2011. (Those dates are Wednesday through Friday.) There may be a pre-meeting geology tour (Sept. 20, 2011).

She also announced that Wisconsin Space Grant will sponsor the National Tribal College Rocket Competition on May 1, 2010.

27. Fall 2012 National Meeting Location Discussion

**Robert Winglee**, Director, Washington Space Grant Consortium, announced that the Fall 2012 Directors Meeting will be in Washington State, probably in late September.

***Saturday, March 6, 2010***

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28. Announcements and Updates

**Frank Six**, University Affairs Officer, NASA Marshall Space Flight Center, announced that he had a list of all students who had been accepted into the NASA Academy Program.

**John Gardner**, past Director of Nevada Space Grant Consortium, announced an upcoming meeting:

Minority Serving Institutions Research Partnership Consortium  
MSIRPC Conference 2010, April 14-17, 2010, Renaissance Baltimore Harbor Place  
Hotel, Baltimore, MD (hosted by Morgan State University)

**Mary Sandy**, Director, Virginia Space Grant Consortium, reminded attendees of the open Global Climate Change Education CAN, which is administered through NASA Langley Research Center. There will be 20-25 awards, and this is an excellent opportunity for Space Grants. Proposals are due April 28, 2010.

29. What's New & Exciting with Pathevo STEM 2.0 – **Janice Riley**, Owen Software (Sponsored by Maryland Space Grant Consortium)

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/24.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/24.pdf)

(Introduction by Dick Henry, Maryland Space Grant Consortium)

New features include an “Administrator Dashboard” which allows administrators to track users’ decisions. Other important features include:

- Enhanced ability to create career pathways for students, advisors, and parents
- Information about Space Grant internships
- Different user levels for high school, undergraduate, and graduate students

30. Advanced Space Technologies Research & Engineering Center (ASTREC) – **Norman Fitz-Coy**, Department of Mechanical & Aerospace Engineering, University of Florida (Sponsored by Florida Space Grant Consortium)

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/8.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/8.pdf)

(Introduction by Jaydeep Mukherjee, Florida Space Grant Consortium)

- ASTREC is an NSF Industry/University Cooperative Research Center (I/UCRC) at the University of Florida
- ASTREC is a partnership involving industry, government agencies, and academia for industry-driven multi-disciplinary research with an emphasis on small satellite technology development, verification, validation, and technology transfer
- The I/UCRC model combines “technology push” with “requirements pull” of industry.
- ASTREC includes “cradle-to-grave” R&D on small satellites, including cost analysis, hardware and software development, assembly and integration, testing, and verification/validation on the ground and on orbit.
- ASTREC provides important training opportunities for graduate and undergraduate students.

- There are presently four universities, five industry partners and seven government agencies in ASTREC. NSF provides about 23% of the funding (\$50,000 per site, plus \$10,000 for the lead institution) and industry members contribute 41% of the funding (\$35,000 annual membership, which supports one graduate student).

31. National Space Grant Student Satellite Program Update – **Luke Flynn**, Director, Hawaii Space Grant Consortium

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/25.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/25.pdf)

Flynn provided an update on the National Space Grant Student Satellite Program (NSGSSP). The Steering Committee for NSGSSP includes Mike Drake (AZ), Chris Koehler (CO), Alec Gallimore (MI), and Luke Flynn (HI). Luke suggested that time be scheduled at a future meeting for discussions on broadening participation in this group.

- Flynn summarized important opportunities in support of the NSGSSP concept:
  - *RockOn!* 2010 (June 19–24, 2010)
  - BalloonSat (July 7–10, 2010)
  - CubeSat Proposal Opportunity
    - Sponsored by the NSF National Space Weather Program
    - [http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5575](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5575)
    - RFP released every year (?)
    - Due date 05/10
  - Nanosatellite Proposal Opportunity
    - Sponsored by the AFRL University Nanosatellite Program (and NASA)
    - <http://www.vs.af.mil/UNP/>
    - RFP released in fall of even numbered years
- Flynn summarized results of a national survey of Space Grant satellite projects.
  - 44 Space Grants reported conducting small satellite programs
    - Many of the groups are working together. There are common needs and the teams make use of common components
    - Time zones and schedules present some problems for collaboration
    - The groups share a focus on the educational benefits; some emphasize graduate students, others undergraduate students
  - He summarized the challenges of working with NASA Centers
    - NASA is risk averse and paper intensive
    - There are also legal challenges regarding satellite access authorization (SAA)
- He went on to describe the Comprehensive Open-architecture Space Mission Operations System (COSMOS). COSMOS is a system of adaptable hardware and software tools that can operate multiple small satellites. The project is being carried out by the Hawaii Space Flight Laboratory with NASA Ames Research Center and Santa Clara University. Participation by other universities is welcome.
- In summary, NSGSSP can play an important role in small satellite development by encouraging common support tools. Universities can lead advances in small satellite technology, in part because they are not constrained by the risk-averse posture of NASA and other government programs.

32. Six Years of Martian Science through the Eyes (and other Instruments) of Spirit and Opportunity – **Jim Bell**, Professor of Astronomy, Cornell University (Sponsored by National Council of Space Grant Directors)

(presentation slides not available)

(Introduction by Yervant Terzian, New York Space Grant Consortium)

Jim Bell described the Mars Exploration Rover mission. Bell is Principal Investigator on the panoramic camera component of the mission. It was noted that a number of Space Grant students had participated in the project. An archive of Mars images is accessible at <http://pancam.astro.cornell.edu>

33. Space Grant Challenges and Issues – **Barrett Caldwell**, Director, Indiana Space Grant Consortium

This presentation was added to the agenda as the result of discussions in the Executive Committee meeting on March 4, 2010. The Executive Committee elected to seek input from the Council regarding the important challenges facing Space Grant. Each consortium was asked to submit a list of its top three issues. Caldwell summarized results of the 30 comment sheets that had been turned in at the meeting. The remaining consortia may submit their lists by e-mail to Barrett Caldwell or Chris Brown (NC). All submissions are considered confidential.

The top eight issues were:

1. Steady and Regular Funding Streams
2. “Timely” Funding
3. Achieving Increased Funding (Both Presidential Request and Actual Appropriation)
4. Simplifying / Streamlining NASA Reporting
5. Problems with Cost Sharing and Match Levels
6. (Responding To) Changing NASA Education Focus / Priorities
7. Managing Numbers of Space Grant Opportunities and Requirements
8. Four Items Tied
  - a. How to increase interactions with NASA Centers
  - b. How to be a more effective catalyst for K-16 STEM Education
  - c. Communications with NASA HQ
  - d. Connecting with local industry

34. National Space Grant Foundation Update – **Wally Fowler** (NSGF President and Director, Texas Space Grant Consortium), Chair and **Mark Fisher**, NSGF Executive Director

[http://national.spacegrant.org/meetings/presentations/2010\\_Spring/23.pdf](http://national.spacegrant.org/meetings/presentations/2010_Spring/23.pdf)

Mark Fischer reviewed the purpose and composition of the NSGF and provided updates on recent activities.

- Mark Fischer serves as Executive Director, and the current Board of Directors consists of:
  - Wallace Fowler, President (TX)
  - Jack Higginbotham, Treasurer (OR)
  - Mike Wiskerchen, Secretary (CA)
  - Philippe H. Geubelle (IL)

- Peter Sukanek (MS)
- The NSGF serves as an internal interface (among the various Space Grants), as an interface with other NASA programs (e.g., ESMD Space Grant programs, International Year of Astronomy), and as an external interface (e.g., Owen Software).
- NSGF provides a variety of support services; currently 36 consortia use one or more of these services. Among these services are:
  - Longitudinal tracking system (26 consortia).
  - Proposal submission and review system
  - Application system
  - Fellowship and scholarship contracting
  - Meeting and workshop registration
  - Website development, design and hosting
- New activities and milestones include the following:
  - Assistance to the NASA Space Science Student Ambassadors Program
  - Support for Summer of Innovation Proposals
  - Management of the AESP Mini-grant program
  - Sustained account balance now exceeds \$1,000,000
  - Contracting with a professional money manager

35. Regional Highlights and Updates on Fall 2010 Regional Meetings Dates
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- Mid-Atlantic Region (***Dick Henry***, MD)
  - 2010 Delaware (September)
  - 2011 New Jersey
- Western Region (***Michael Sibbersen***, NE)
  - 2010 Omaha, NE, Sept. 16–18, 2010
  - 2011 either Alaska or Arizona
  - 2012 Washington State
- Great Midwest Region (***Philippe Geubelle***, IL)
  - 2010 Minneapolis, MN, Sept. 16–17, 2010
- Southeast Region (***Jaydeep Mukherjee***, FL)
  - 2010 South Carolina, Sept. 24–25, 2010
- Northeast Region (***David Bartlett***, NH)
  - 2010 Newport, RI (dates pending)

Adjourn at 12:07 pm
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