

Minutes of the National Council of Space Grant Directors' Spring Meeting

Arlington, Va., March 3 – March 5, 2016

General Session: Day 1

Council Business

1:00 Welcome – *Eric Day* (DC SGC)

Eric Day welcomed everyone on behalf as D.C. Space Grant. He also mentioned local amenities.

1:10 Introduction and Executive Committee Updates – *Stephen Ruffin* (GA SGC), Council Chair

Steve Ruffin welcomed everyone and mentioned how Space Grant is a family. He also mentioned how D.C. is such a special place to be.

Introduction of new people. New program manager for Washington, April Huff. Texas has a new associate director, Timothy Urban. Pennsylvania introduced Jess Bibi, new program coordinator. Ohio introduced the new interim director Jed Marquart. Louisiana introduced Doug Granger, who works on ballooning and on IT. Delaware has a new interim director, Bill Matthews. Affiliate to Hawaii from Guam, John Peterson, travelled 3,600 miles to attend the Spring 2016 meeting. Montana introduced Shane Mayer-Gawlik as the ballooning coordinator. Alaska introduced Morgan Johnson, who works on their CubeSat program. Arkansas introduced Missy Hill, the new Coordinator. Missouri introduced its new director, S. Balakrishnan.

Steve acknowledged the contributions of Mary Sandy and that Mary was honored for 25 years as director of Virginia Space Grant. Standing ovation for Mary.

1:20 Nominating Committee Update – *Bill Garrard* (MN SGC), Nominating Committee Chair

Bill Garrard described the vacancies: Chair, three Excomm members, three members of the Nominating Committee. The Nominating Committee presented its slate and invited floor nominations.

Bill also mentioned that he is leaving the nominating committee and announced his retirement from Univ. Minnesota and consequently from directorship of Minnesota Space Grant. He started with Space Grant in 1991 and became director a few years later. He received a standing ovation from the audience.

Collaborative Programs

1:30 *T. Greg Guzik*, (LA SGC) – Six Days at the Edge of Space: 10 Years of HASP Balloon Flight Operations

Steve Ruffin introduced the speaker. Greg began with an overview and history of the program. Initiated by a need for workforce development. They started with RockSat and continued with several high-altitude programs. HASP (high altitude student platform) is a multi-payload platform. Eight payloads less than 3 kg and four payloads up to 20 kg were flown.

Camera provides real-time monitoring. Payload development schedule begins in the fall and flights take place on Labor Day. Typical flight goes westwards. System is very robust, with little damage to the payload as it makes contact with the ground.

Number of participants and participating states has increased every year. See presentation for a list of tests and for measurements taken. Students have regular access to a near space environment.

Student teams pay for their own travel and supplies.

1:45 **Bob Belle**, Southern Regional Education Board (SREB) – NASA Engagement in the Institute on Teaching and Mentoring

Steve introduced the speaker. He mentioned that the diversity participation drops quite precipitously from high school to college, College to grad school, grad school to Ph.D.

Speaker involved with the AGEP program. He has been involved with and fascinated with space. Dr. Ansley Abraham is director of the State Doctoral Educators Program. The goal is to promote Ph.D. degrees for minority students. 2015 attendees brought together 800 minority scholars.

The stages of development are the following. Undergraduates: how to express a good relationship with mentor. Beginning Doctoral: managing stress and time, the business of education. Middle of Doctoral Study: Writing the Dissertation. Near Completion: presenting research effectively, negotiating first faculty position. After Completion: maintaining the career.

Partners: NSF/AGEP, NIH, McNair Scholars, Alfred Sloan minority scholars, Gates fellowships.

Next institute in Tampa, Fl. Costs a bit less than \$1,000 to send a student. Asking for help from SG to send students to the meeting. Positive feedback from students who attended the institute. Any state that wants to send scholars to the institute contact the speaker.bob.belle@sreb.org

2:00 **Carl Carruthers**, NanoRacks – NanoRacks Research Platforms

Steve introduced the speaker. Avid pilot and scuba diver, and he has been in zero-gravity airplanes.

Speaker received support from Space Grant as a student.

Nanoracks is a commercial payload services developer. Involved with 300 payloads since 2009. They have several microgravity science platforms. He described one of the platforms, 1 and 2. Please see slides for more details on the platforms and modules. They also have a mix-stix, in which compounds can be placed. They have worked with MUREP. They also have a small USB microscope. Also a cube sat deployer. They were involved with the Blue Origin suborbital flights.

2:15 **Kevin Crosby and Christine Thompson** (WI SGC), **Jim Bertin and Danielle Freemont** (Chief Dull Knife College) – First Nations Launch: Launching Rockets, Breaking Barriers, Starting Careers

Kevin Crosby, Director of Wisconsin Space Grant, gave an overview. Program has been in place for seven years. There is a different competition scope each year. Christine Thompson introduced the speakers. She described the hardships that tribal families endure, including lack of funding and lack of access to technology and computers. Another challenge is lack of role models in STEM fields in tribal communities. Please see presentation slides and the movie.

Chief Dull College won first place and one of their participants in the program. Danielle Freemont described the social and economic issues faced by Native Americans. She mentioned education as the way to step out of the predicament. She described her experience with deciding to further her education. Her experience has given her the confidence to further her STEM studies and become a biologist. She described her experience with NASA and Wisconsin SGC as a life changer.

Jim Bertin, who teaches math at Chief Dull Knife College, described his involvement. Three years ago, they were given the opportunity to go to Kennedy Space Center. Montana SGC was generous enough to support five more students. This trip became the precursor for the building and launch of a rocket. Following year they brought eight students. The challenge and thrill of launching a rocket and succeeding is indescribable. Participants in the program have enrolled in STEM programs in college at much higher percentages than other studies in their communities.

Please contact Wisconsin Space Grant for more information and on how to participate.

Invited Talks

2:35 **Dava Newman**, NASA Deputy Administrator – NASA’s Journey to Mars and Beyond

Steve introduced the speaker. They went to graduate school together at MIT. Steve described her as remarkably inquisitive and remarkably brilliant. Dr. Newman has had a distinguished career and she was a faculty member at MIT before becoming deputy administrator at NASA. She has a Ph.D. in aerospace biomedical engineering.

Dr. Newman described the merger of art, science, design and engineering. She mentioned earth observing satellites. She discussed a yearly chart of global warming. She described the status of the journey to Mars, as well as the recently completed study of Scott Kelly, who spent nearly a year in space.

Explorations mission will be launched this fall, with more launches later. Goal is to be earth-independent in these missions.

Partnerships with private industry, Orbital ATK, SpaceX Dragon, Russians, Japanese agencies.

Strategic Plan Objective 1: Expand human presence into the solar system and to the surface of Mars.

We have been observing Mars for 50 years. We get continuous data from the Mars rovers. She showed a chart of history and future of Mars exploration. Please see slides for details.

Juno will go to Jupiter in July 2016. OSIRIS Rex, James Webb space telescope, new aviation horizons: cleaner, faster, quieter. Ultra efficient subsonic demonstrators, low-noise supersonic flight.

Q&A. Q on UAS. How much is NASA involved? NASA is heavily involved, autonomy, unmanned air traffic management. Investing for the technology.

Q on better faster propulsion technology. Takes 6 months to get to Mars. Can we make it faster? NASA is looking at a variety of options. Including solar and nuclear.

Q on going to the moon. A development of lunar systems is on NASA's priority list.

3:05 **David Bowles**, NASA Langley Center Director - 100 Years of NASA Aeronautics Brings an Exciting Future

Mary Sandy introduced the speaker. He has served in various research and leadership position at NASA. Ph.D. from Virginia Tech, in engineering mechanics.

Big month on aeronautics. Langley research center founded in 1917 soon after NACA was established. Airfoil development, military aircraft, vertical craft and rotorcraft. Problem solving attitude still continues at Langley.

Ongoing work: Environmentally responsible aviation. Supersonic commercial flight. Air traffic control systems. UAS systems. Collaboration with Boeing. Keeping bugs off the leading edge of wings. Impact research. Active flap control. Advanced structures and materials. Crash testing.

Facilities, people, digital transformation. 20 year plan to renovate and modernize the physical plant of Langley Research Center. Strategic plan for the workforce.

Building plans for the future. Advancing capabilities in assembly of composites, autonomous systems, computational digital transformation, and CFD, as well as impact dynamics. Innovative vehicle designs. Fuselage designs that are not cylindrical, truss-braced wings for high aspect ratio, multi-propeller using distributed electric propulsion.

Partnerships with industry and academia. Please see slide for partnering organizations. New aviation horizons. Quieter, more efficient air vehicles.

3:30 **Coffee Break and Networking**

Space Grant Student Presentations

Moderator: **Eric Day** (DC SGC) - Broadcast live on Google Hangout

3:45 **David Hinckley**, University of Vermont (VT SGC) - Interplanetary Spacecraft Trajectory Optimization

Speaker introduced by Eric Day. He described challenges in trajectory optimization. Such complexities necessitate evolutionary computing. Speaker described reference orbits and regions of interest. See presentation for details of perigee and apogee and other orbital parameters. Mr. Hinckley also described the algorithms he used. Two topological metrics, tetrahedron quality and tetrahedron length. Multiple test cases considered, such as deployment at true anomaly. Different impulses and response.

4:00 **Rachael Carmichael**, University of Nevada, Reno - Efficient Cyclization Methodology for Biologically Relevant Precursors

Ms. Carmichael was introduced by Lynn Fenstermaker, director of Nevada Space Grant. Research focuses on minimizing hazardous chemical waste and reducing costs. Goals include building complexity with fewer steps. Duels-Alder Nazarov cyclization awarded Nobel Prize in chemistry. Speaker described the proposed mechanism (please see slides for details) for the desired product.

Q. How do you separate isomers? On a small scale they characterize the isomers and use special equipment. On a larger scale, they use silica gel and look at the results. Also gas chromatography.

4:15 **Jeff Tessein**, University of Delaware (DE SCG) - Effect of Coherent Structures on Energetic Particle Intensity in the Solar Wind

Bill Matthews, interim director of Delaware SG, introduced the speaker. Speaker showed a figure of what is involved in space weather and solar wind. A lot depends on the geomagnetic properties of space, such as GPS devices not working and birds getting disoriented. Solar energetic particles consist of flares and of CME shocks (see slides for more details). He uses a PVI technique to locate discontinuities in measured data and to compare with simulations.

Data comes from the ACE (Advanced Composition Explorer), launched in 1997. It is now at the L1 stability point of the earth-sun system. Data analysis is statistical. Question, how do discontinuities in the magnetic field affect energetic density? Stronger discontinuities associated with higher average energetic particle flux. Structures are likely flux tube boundaries. Implications from shocked regions.

Eric Day concluded by thanking the students and also NASA Langley for helping with the broadcast.

Council Business

4:30 Secretary and Treasurer's Report – **Haim Baruh** (NJ SGC), Council Secretary and **Majid Jaridi** (WV SGC), Council Treasurer

Minutes approved unanimously. Majid showed a slide of the treasurer's report and described the income sources and the expenses. We lost some money due to a downturn in the stock market. Excomm accounts are invested in two funds. Quasi endowment and participant directed funds. The Excomm accounts total about \$27,000.

4:40 Council Elections - **Bill Garrard** (MN SGC), Nominating Committee Chair

No floor nominations were made. The following slates proposed by the Nominating Committee were approved by acclamation.

Chair: Stephen Ruffin (GA)

Executive Committee: Luke Flynn (HI), Toni Galvin (NH), and Denise Thorsen (AK)

Nominating Committee: Philippe Geubelle (IL), Chris Koehler (CO), and Suzanne Smith (KY).

4:55 Announcements

5:00 **Darla Jones Kimbro** and **Sonya Greene**, NASA Office of Education One Stop Shopping Initiative (OSSSI) Training

It is best to look at the presentation slides.

6:00 **Adjourn**

General Session: Day 2

7:30 Hot Breakfast (Foyer A)

8:40 Announcements and Updates

James Flaten (MN): 7th Annual Academic High-Altitude Conference, to be held in St. Paul. Workshop as well as conference. Everyone welcome.

Institute on Teaching and Mentoring.

Pre Service Educator Eclipse Competition in Montana.

NASA Education Updates

8:45 **Donald James**, NASA Associate Administrator for Education

Steve introduced the speaker. Mr. James is a very good friend of Space Grant.

He talked about the NASA goal to send humans to Mars and back. NASA education is about humans and about investment in human capital. Space Grant fits into all of the four lines of business of NASA.

Budget of Space Grant for infrastructure costs was reduced this year to about 5%. He wants Space Grant to support more students and more educators.

Switching to new operating procedures after evaluating them.

Success story. Michele Manual, who received support from Florida SGC while she was a student, earned her doctorate and received a PECASE award.

Q. Majid Jaridi. Expressed his thanks for the interest in Space Grant and for giving us the augmentation funds. A. Mr. James heard us when we recommended that augmentation is reintroduced. But we have to do it with the regulations and constraints they are facing.

Q. Chris Brown. Grateful that you reduced overhead costs. A. Went from 24 to 9.6%.

Q. Other national programs, such as Sea Grant, have lower administrative costs. A. Other organizations operate in different ways and there may be other ways the managers there may obtain revenue through other means. So it may become a comparison of apples and oranges. Reduction of costs is a continuous process and this is why Mr. James asked for a VSA assessment.

Q. Do you have a time frame? A. Probably by 2018.

Q. Jack Higginbotham. Why do we need to do all this plus up requests? Can't the president's request be the same as what we end up getting eventually? A. He gets this question from Congress all the time. His strategy has been to convince congressional leaders about the value of Space Grant.

Q. Toni Galvin. If there are any MUREP students who lost funding as a result of budget shifts tell me who they are and we will support them.

NASA Space Grant Program Updates

9:10 **Lenell Allen**, Director, Aerospace Research and Career Development (ARCD), and NASA Headquarters Space Grant Staff

Steve introduced the speaker. Dr. Allen began by introducing her staff. For Space Grant, Mike Cherry, LaTeicia Ford, Dr. Sonya Greene, Dr. Frank McDonald, Dr. M. Warfield Teague.

For EPSCoR, Jeppie Compton and Ms. Crystal Bassett. She also introduced NASA center educational personnel.

Dr. Allen would like to hear more about success stories. Student-centered is the motto she likes to use.

Office of Education and Texas Space Grant audits. OIG reports for OE as well as Texas Space Grant. Google the term “Office of Inspector Report” and look at these two reports. Procedures aimed to insure verification and validation, citizenship requirements, cost share match requirements, timely close-out process.

Make sure your SG budget is managed in alignment with your sponsored research office requirements.

Evaluation Update. A six-month interim report expected by September 2016. It will contain recommendations for the new five-year solicitation. See presentation for the OE Congressional Justification web site.

USIP Update. About 40 awards were made with a two-year period of performance.

See presentation slides for deliverable actions and estimated completion dates.

Meeting Dates. See presentation for meeting date schedules. Dr. Allen wants to integrate Space Grant and EPSCoR.

COHESIVE concept. Culture of Honor, Excellence, Stability, Integrity, Vigor, and Enthusiasm. You as SG leaders are role models for students. If they see you engaged they will also be.

Q. Denise Thorsen. USIP award count. A. 40 Space Grant and SMD awards.

Q. USIP awards were to be announced in January, and Denise for planned for that. Now we have lost the spring semester, and possibly the summer due to the bureaucracy at universities. Please consider academic calendars when setting deadlines for awards. A. Thank you for your question, and Dr. Allen continued to discuss the challenges associated with coordination. She is working hard to improve coordination.

Q. Chris Brown. Have you looked into making fewer but larger awards? A. Dr. Allen is looking into every avenue of action and also looking at NASA evaluations to chart a course of action.

Q. Chris Koehler. Do you have an idea as to when the final evaluation will be completed? A. Looking at a number of factors.

Q. We are grateful to your leadership and architecting the three-year grant. But biggest thing to be thankful for is the release of the new five-year solicitation. A. Thank you.

Mike Cherry. Three topics. Questions you asked, reporting update, success stories.

LaTeicia Ford

Q. When will consortium receive their year 2 funding? Contingent upon receiving a satisfactory APD.

Q. Date for augmentation teleconference? A. March 15 and 16, 2016.

Q. Statements in proposals? A. Everything has to be restated in whole.

Q. Cost share. Can we count excess cost share in augmentation? See presentation slide for the detailed response.

Q. NIFS related. A. Cost share total cannot be reduced if you have more NIFS than the equipped minimum.

Warfield Teague.

Q. Publication database? A. Waiting from an answer from then Office of General Council.

Q. SMART objectives. Do we need a new set of objectives or objectives from base proposal? A. Develop and add as needed.

Q. Targets in years 2 and 3? A. More instructions are coming.

Q. Please provide an example of the SMART table. A. Please make sure your proposal shows good judgment.

Q. APD page limit. Can we increase page limit? A. No.

Q. Opportunities for international students? A. Not for SG but yes for EPSCoR.

Q. Staff involved, why is staff not reported? A. Good idea and we will add a new section for staff in APD.

Q. Longitudinal tracking. A. Only need to track students until their next step. See slide for the lengthier answer.

Reporting will be different this year. See slides for more details. NCE reporting will be collected under FY2014 screens. Complete Project Cost Tables to show full award amounts for FY2014.

NASA IDs, Security Training, OEPM access. See slide for process. Make sure you complete the security training.

Success stories. See presentation for details.

Q. Any chance of moving up the deadline because telecon is two weeks before the deadline? A. No. Please send us your questions before the telecon.

Steve Ruffin led the audience in thanking the outstanding staff at the Office of Education.

Invited Talks

9:50 ***Dave Lavery and Jennifer Grove***, NASA SMD Solar System Exploration – Opportunities for Space Grant in the American Velocity Challenge (AVC)

Steve introduced the speakers. Dave Lavery is with SMD. AVC has three stages, air, sea and land. Each leg is manned by 14 members.

Airbreathing engine is the main part. Will be used on all three legs. A team's success is based on how much payload they can transport. Airplane, boat and car made from kits.

Race begins with air travel in summer 2017 in Wisconsin. Travel to Lake Mead. Change to sea, transition to Mesa County in Colorado. Total race time is 12 days.

Very extensive media coverage, especially in social media. 17 hours of video content. Final broadcast will be on national TV.

STEM opportunities include: AVC build process, academic year long, designed for incorporation into core academic program, high school curriculum content, opportunities for project-based learning.

16 slots are available. First offered to the Space Grant community.

Entry fees \$150,000, paid in three installments. Opportunity for universities and SG consortia to collaborate and develop joint teams.

Q. Dick Henry. Very concerned with safety since speed is the main criteria. A. They have been looking at safety issue from beginning. Aircraft built has to go through several certifications. Several other safety checks ensure safety.

10:05 ***Kristen Erickson***, Director, Science Engagement and Partnerships - NASA HQ

This talk was moved to after the break.

Steve introduced the speaker. Ms. Erickson began by giving a report on the status of SMD and activities and locations. See slides for map and locations.

SMD restructuring. Enable STEM education, improve us scientific literacy, advance national educational goals, leverage through partnerships.

How? Competitive selection of organizations that utilize NASA data.

How does NASA science education and NASA education work together? SMD has science discipline experts, science and engineering content, authentic experiences, relationship managers, leveraged SMD infrastructure. Unique roles and leverages in SMD.

Went through a peer evaluation last year. The review identified gaps in SMD programs. There are now more non-white students in public schools than white students. This diversity is not reflected in STEM fields and SMD functions. Risk area for science.

Upcoming opportunities. In NSF INCLUDES (see slides for more detailed information) April 15 deadline for pre-proposals. \$300k. Please look into NASA ROSES. Several research opportunities check NSPIRES. STEM education partnerships.

Please look at the next three slides describing opportunities. NASA 2017 eclipse education program. Coming up is the JUNO orbit insertion into Jupiter.

10:25 Coffee Break and Networking

Collaborative Programs

10:50 **Luke Flynn** (HW SGC) – Rapid Growth of Small Satellites: Implications for NSGSSP

Steve introduced the speaker. Described demand for space. In last 60 years, 6,500 satellites have been launched and about 1,000 of these are operational.

In next three years, 11,000 small satellites are expected to be launched, primarily by industry.

Small spacecraft facts: Payload cost is higher than launch costs, new commercial satellites smaller but with shorter durability. Replacement costs \$1-10 million. Cost of launch has become much lower. Sweet spot for complete missions around \$10-25m.

See next slide for partnerships developed. Luke showed pictures of launch of a sounding rocket. Launch was perfect. 300,000 lb. of thrust. However, rocket exploded soon after launch. Accident investigation is still going on. Fairing issues are being considered.

Several ideas for the future or NSGSSP. A lot of people still do not know about Space Grant. Developing workshops for students. Draw upon small satellite expertise across clusters of neighboring states. Inventory test equipment across NSGSSP.

Q. Are there any workshops scheduled? A. Oregon will host one.

11:05 **Francis Chiaramonte** and **Harri Vanhala** (NASA HQ) - Use of the NASA Physical Sciences Informatics System NRA

Steve introduced the speaker. Description of the informatics system database. Program considers biophysics, combustion, fluid physics, complex fluids, materials science, and fundamental physics. Gravity-dependent and microgravity research.

Objective: from microgravity science to open science.

See slides for the proposal evaluation, awarding, and data collection process. Red arrows in slide are the new process. Looking for proposals in informatics.

See slides for research areas and eligible investigations (Appendix B), as well as key information and dates, as well as eligibility. Awards expected for \$75k to \$100k per year for a two-year award.

Slides show how to navigate the data and information on how to access the informatics database.

11:20 **Jeff Goldstein**, Center Director, National Center for Earth and Space Science Education - Collaborations Between Space Grant Lead Institutions and NCSSE / Clarke Institute: Successes and New Opportunities

Steve introduced the speaker. Mr. Goldstein began with updates. See slides for a list of partners. 28 states have been involved with NCSSE since its inception.

See slides of operational overview pipeline programs and university community programs. Students in this program have been admitted to Stanford, Columbia, and U. Chicago. Next flight opportunity will be in September, and launch in spring 2017.

See slides to view the track record of this program.

Voyage on the National Mall. Scale model of solar system. They want to have this display replicated in 100 places around the world. Has to pass through expensive reviews similar to a WW2 monument. D.C. SG helped with renovating the display in Washington, D.C. New website has been launched. Concept pictures for future exhibitions. Cost of placing such a monument in last slide of presentation.

11:35 **Chris Koehler** (CO SGC) – RockOn Update and Opportunities

Presented in the afternoon due to time constraints.

Chris showed a video of RockOn. Hands-on workshop where teams build payloads. Good way to have your students work with NASA scientists, engineers and technicians.

Interactive Flipped Meeting (Jefferson III)

1:00 **Angela DesJardins** (MT SGC), **Chris Koehler** (CO SGC), and **Brian Chad Starks** (DE SGC)

Minutes to be provided soon.

Fellowships and Internships Opportunities and 2016 Selection Process

2:15 **Carolyn Knowles**, NASA Internships, Fellowships and Scholarships (NIFS) Director

Steve introduced the speaker. Ms. Knowles began by introducing her colleagues.

NIFS/SPWG relationship to SG. Five-year strategic plan. Six subgroups: NIFS/SG procedures, recruiting, SWOT, IT, road map implementation, integration. Final plan due 5/20.

In 2014, 700 interns were placed. In 2015, 900 interns were placed. So far, in 2016, 500 interns have been placed.

Purpose for process development. Working strategy, addressing efficiency and challenges, pilot process in Fall 2014 and spring/summer 2015. Feedback from directors and release of version 2.0 of OSSI.

All intern applications are processed through OSSI. Please see rest of slides for more details. Ms. Knowles then showed the financial details of the internships and the deadlines.

Please see chart in presentation summarizing the process.

Q. Majid Jaridi. Why did we receive two sets and not just one? A. We want students going to OSSI early. IT issue in putting all applicants together.

Q. Did all consortia receive lists? A. All states should have received lists. If your state did not receive a list none of the applicants from your state were recommended. At least in round 1.

Q. Recommend to send messages to each state whether they received notices or not. A. Good idea.

Q. Will you be looking for input from SG? A. Sonya Greene and Lenell Allen will do that.

Space Grant Collaborative Programs

2:35 **Tim Paglione**, York College, CUNY, (NY SGC) - New York's Community College Partnership

Steve introduced the speaker. Mr. Paglione is from CUNY. The program's goal is to increase women and minorities completing their STEM degrees and transferring into four-year colleges. Also, to build a sense of belonging, mentoring, as well as a prep course on Methods of Scientific Research.

Collaborate with NSF PAARE program, American Museum Natural History, Columbia University.

They noticed that their students at CUNY were not well-prepared for research. AstroCom NYC was created to address this issue. Methods of Scientific Research course created in a short time and now they have six sections running. Run in spring semester, so as to prepare students for summer research.

Mentoring: academic advisement and transfer help, career models, counseling by peers, scholarship information, and longitudinal support. Research mentoring during the summer.

Results. In Year 1, 13 diverse STEM majors, placed for summer research in NYC and at NASA centers. Two sections of the new course and two faculty workshops. Students have transferred to major universities.

Year 2 has 25 students enrolled, 52% women and over 70% minority. Five courses sections throughout New York State. Six faculty have been supported. Year 3 will be even better.

Q. Would curriculum be available to other SG consortia? A. Workshops work best one on one. Not very comfortable at this point to have workshops nationally. No lab manual yet.

2:50 2017 Eclipse Ballooning Project - *Angela DesJardins* (MT SGC) and *Shane Mayer-Gawlik* (MT SGC)

Steve introduced the speakers. Angela showed the poster for the project. Also a quote from Margaret Mead: Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.

A quarter of the US public thinks the sun rotates around the earth. Goal is to prepare a video on the 2017 eclipse and show on NASA web site, which is visited by over 5m people a year.

Funding for eclipse included in augmentation. Breakdown of cost estimates on eclipse web site. Big Bang for the buck.

See slides for timeline for the workshop, which is required for participation, as well as additional details. Flexibility in paying the workshop fee.

Randy Larimer. Gave a breakdown of costs and how the tracking process, which is required by the FAA. We can remotely send a message to the balloon to terminate the flight, if needed.

Angela has been contacting NOAA and NSF.

Shane discussed the spectrograph competition for undergraduate pre-service teachers. See slides for details. Q and A sessions each Tuesday and Wednesday, March 8 and 9. 10:30 and 2:00 p.m.

3:05 Group Picture

3:15 Coffee Break

Space Grant Program Additional Items and Open Discussion Session

3:30 *Lenell Allen* and NASA Headquarters Space Grant Staff

Moved to 4:15 p.m. Opportunity to ask questions to the NASA OE staff.

Warfield described the APD schedule. Year 1 APD is due 60 days before the grant date. End of NCE APD is due 30 days after the grant is over.

Q. Denise Thorsen. Possibility of adjustments to previous OEPM submissions. A. Yes.

Lenell Allen said you really need a good reason for granting NCE. OE is under intense scrutiny.

3:50 **Open Q&A Session: Program Coordinators, Directors and NASA Staff**

Merged with previous session.

Space Grant Foundation Updates

4:20 *Philippe Geubelle*, National Space Grant Foundation President (IL SGC) and *Mitchell K. Hobish*, National Space Grant Foundation Executive Director

Steve introduced Philippe Geubelle, director of Illinois SGC and president of the Foundation. Philippe started by giving a history of the Foundation. He also gave a list of Foundation Board members.

Foundation receives and manages donations, processes membership fees, manages investments, processes non-programmatic expenses, reports on financials, and is now thinking about doing a financial webinar. \$1.5m in participant director funds and 400k in quasi-endowment funds. Financial advisor is Ms. Kerry Kearny.

Long-term goal is to have over 4% returns on the investments.

Direct support for SG programs. Meeting registrations, etc., also external contracts, such as managing Aerospace Scholars (JSC) John Mather Scholars, KSC education services

Administrative 0.7 FTE, contracts, 0.45 FTE.

Search for new executive director was conducted last year and a selection was made: Dr. Mitch Hobish. Dr. Hobish said he learned about the position from Angela DesJardins. See slides for his resume. He is self-employed in technology fields for over 35 years. Mission planning in life sciences, astrobiology, math, system science. He has been involved with technical documentation, report editing, research and business proposal review and guidance, also educational and public outreach activities. He also was involved with the Pete Conrad foundation. He has collaborated with the Montana SGC since 2011.

Dr. Hobish said he liked the job description as soon as he saw it. He has been very impressed with the Foundation staff. His impression is that the Foundation is steady and stable. There are a few holes to fill but by and large things look good.

Must generate financial stability and growth. Endowments, grants and contracts, new capabilities, new services.

He will speak with every SG director; establish relationships with NASA and centers. Draft targets, and develop new opportunities.

Longer-term activities include new ways of serving SGC, bring in funding, improve operations, and generate policies.

4:55 Announcements and Recap of Day 2

Steve asked us to thank Mark Fischer and Shirley Campbell.

Announcement by Willie Williams from JSC: Proposed Content for a Rapid Freeze Capability Thrust Area for ISS. Please look at slides for more details. Need to fast freeze samples and use them later in space. Primarily for space biology experiments. This maybe more of a university research opportunity than SG.

5:00 **Adjourn**

General Session: Day 3

9:15 Announcements and Updates

Mission Directorate Working Groups

9:20 Mission Directorate Working Group Breakouts and Reports

Aeronautics Research: Michaela Lucas (NE) reported. The group will continue to disseminate aeronautics-related activities, as well as improve contact with the Aeronautics mission directorate. This year, aeronautics is getting additional funding in the NASA budget and a discussion was held how to get Space Grant more involved with the Aeronautics Mission Directorate and the return of faculty internships and the Aeronautics Academy.

The Aeronautics co-chairs conducted a survey of existing aeronautic activities at Space Grant Consortia. A little over a third of the consortia provided answers. The survey results indicate that aeronautics

activities are primarily in the college student and faculty level. Mostly dealing with aircraft, design and aerodynamics being the most studied topics. Haim Baruh and Michaela Lucas reelected to serve as co-chairs.

Human Exploration and Operations. Barrett Caldwell (IN) reported. Approximately 15 people were in attendance, including Katrina Emery (SSC) and M. David Kankam (GRC). The meeting began with the discussion on whether the HEOMD Working Group had outlived its usefulness. Our major priority over a period of years was to solicit opportunities for students to gain experience in flight experiments. This has been achieved. Other opportunities for partnering with HEOMD are limited, in that this Directorate does not have embedded Education and Workforce Development funds at the scope or discretion that Science Mission Directorate still manages.

The group discussed an ongoing challenge of identifying opportunities and skill sets that exist in the university community that could be leveraged by current or (preferably) future HEOMD research needs. (We specify future research needs to help identify capability and relevant expertise for open discussions between university researchers and NASA HEOMD managers in a pre-solicitation environment.) However, there is a “chicken-egg” problem, in that HEOMD has requested that Space Grant Consortia (SGCs) generate a general list of capabilities among affiliate universities (over 1000 potential universities would need to be surveyed on a regular basis), while SGCs have requested a “job jar” or “wish list” of project needs from HEOMD researchers and managers (a more feasible number).

There was a request by SGCs in attendance at the Working Group meeting to allow for search and selection of NIFS opportunities by Mission Directorate within OSSI, so that students and SGCs could help to recognize HEOMD-related opportunities across the Centers.

An initial attempt to connect emerging HEOMD needs and SGC capabilities was begun in 2015, when Carol Galica (carol.a.galica@nasa.gov) from Advanced Exploration Systems (AES) described an interest from Jason Crusan (jason.crusan@nasa.gov) to connect AES activity to SGCs. Although an opportunity was suggested for Working Group chair Caldwell to attend an AES quarterly or milestone meeting, logistics prevented closure of this loop. Jaydeep Mukherjee (FLSGC Director) has agreed to follow up on this issue.

There is a growing effort for Technical Interchange Meetings to bridge university and NASA capabilities. The next one is scheduled for GRC in July; additional information is being solicited.

The Working Group did not resolve the issue of additional tasks to initiate, pending resolution of the challenge of HEOMD-based needs or SGC-based lists of capabilities. Further, Barrett Caldwell will not be available to continue in his role as Working Group Chair past July 31. Thus, the Working Group recommends that its activity be suspended until additional clarification can be received regarding the status of AES coordination and other needs matching with HEOMD research groups.

Science

Terry Teays (MD) presented. About 30 participants in the Science Working Group meeting, including a number of first time participants. The WG discussed the SMD-Space Grant internship program. For this coming summer we had three missions offering positions, viz., Hubble/Webb, Chandra, and OSIRIS-Rex. There was an internal problem at STScI that killed the internship there, at the last minute. There were applicants from four SG this year. All together, Chandra has accepted two interns and OSIRIS-Rex one. Final arrangements are in progress. The WG discussed the new SMD strategic communications and public engagement program, including the 47 institutions that were awarded funds. Three of them have

close ties to SG, and the WG received a summary of the work that will be done at Washington State and North Carolina.

Space Technology

10:25 Coffee Break and Networking

SG Regional Breakouts

10:45 Space Grant Regional Breakout Sessions and Regional Highlights

Great Midwestern - Regional meeting will be held on Oct. 7-8, 2016, at the University of Michigan in Ann Arbor, Michigan.

Mid-Atlantic - Regional meeting will be held on Sept. 29 - Oct. 1, 2016, at Johns Hopkins University, in Baltimore, Maryland.

Northeast – Regional meeting will be held Oct. 6-7, 2016, in New York City, New York.

Southeastern - Regional meeting will be held Sept. 28-29, 2016, in Lexington, Kentucky.

Western - Regional Meeting will be held on Sept. 30 - Oct. 1, 2016, in Bend, Oregon. Also, the Student CubeSat Workshop will be held on August 19-20, 2016, at the Evergreen Aviation and Space Museum in McMinnville, Oregon.

11:50 Meeting conclusion with recap of key discussions, key decisions, upcoming events, and outstanding actions

We all thanked Steve Ruffin for running and excellent meeting and the District of Columbia team, Eric Day and Megan Kemble, for organizing the meeting and for all their efforts.

12:00 **Adjourn**