2015 Luncheon Speaker Notes

January 20th - Administrator Bolden reminded the audience of a few accomplishments that NASA had in 2014 - Orion/EFT–1 launch and recovery in December, Cryo testing of the JWST Integrated Science Instrument Module (ISIM) at GSFC, a 500-second hot fire test of the RS-25 SSMEs at Stennis in support of Space Launch System, and MAVEN achieving an orbit around Mars. He talked about how the Orbital Cargo resupply accident at Wallops in 2014 may turn out to be fortuitous, since Orbital recognized that they are responsible for delivering a SERVICE, not a launch vehicle, and therefore quickly realized that getting an Atlas V on-line for the next Cygnus launch was the right thing to do.

Mr. Bolden also stated that, as the audience already knows, these tremendously large feats that the public sees us complete are actually due to many, many tiny steps forward that we all take every day, all proceeding in the right direction, with the goal of meeting and achieving the final large accomplishment. He thanked the audience, comprised primarily of aerospace industry executives, for continuing to work with NASA ("because I know we're not always an easy customer to have!"). General Bolden closed the lecture with the following statement, exemplifying his "tiny steps" observation. "Today, NASA is really right on the edge of being 20 years away from landing on Mars. Now I know it feels like we've always been '20 years away from landing on Mars' - but this time we really are!"

February 25th - Center Director Chris Scolese reviewed NASA GSFC's accomplishments for the past year, which included the DSCOVR launch, one year of successful operations for GPM, the MAVEN orbit insertion and science operations at Mars, further discoveries at Mars by the SAM instrument on the Curiosity rover, ISS cargo resupply missions to ISS from Wallops, launch of the SMAP mission, several sounding rocket and balloon mission successes, and the completion of JWST Integrated Science instrument Module (ISIM) thermal vacuum testing at GSFC, with preparations underway for observatory test at NASA JSC. He also reviewed the new missions coming up, including AFTA/WFIRST, a concept development for an 8-20m diameter space telescope to search for other planets, the Asteroid Redirect Mission (concepts A and B still in evaluation at NAS Headquarters), a "carbon copy" of Landsat-8 to be the next Landsat mission (now referred to as Landsat-9) and initiation of the PACE mission.

March 17th - while charming attendees with his “Irish brogue”, **Dr Frank Kelly**, Director of the Earth Resources Observation Systems (EROS) for USGS, reminded us that in 1966 William Pecora (former USGS Director) and Stewart Udall (Undersecretary of the Interior) were the catalysts who spearheaded the use of land imaging satellites to better understand emerging natural resource problems.

Dr. Kelly emphasized that in 2014, Sustained Land Imaging continues to be a top priority. He highlighted that the President’s 2016 Budget Request provides USGS and NASA “funding to extend and build on the Landsat data stream through the Sustained Land Imaging (SLI) Program”. This includes Landsat Ground System maintenance operations and enhancements, Landsat 9 as a rebuild of Landsat 8 (2023 launch), the Thermal-Infrared Free-Flyer (2019 launch) and a multi-year technology development effort for Landsat 10. By sharing land images and data from three decadal observations, Dr. Kelly illustrated how mathematical prediction models are increasingly accurate and how enhanced monitoring, assessment and projection capabilities continue to advance our understanding of land change.

April 17th - Mikulski Commits to "Give "em Hell" at April MSBR Luncheon - Per MSBR-tradition, **Senator Barbara Mukulski** (D-MD) returned to the University of Maryland Conference Center on April 27, to address over 800 leaders from NASA, NOAA, USGS, the University of Maryland, the Naval Research Laboratory, and industry regarding the state of the Senate/Congress, her plans for the remainder of her term, and the heath of the Maryland space.

The meeting began with a short presentation from Prince George’s County Executive, Rushern L. Baker,

III. Mr. Baker recalled the time when he first became County Executive and he met with the Senator from Maryland. “She asked me ‘how well do you know your county, Rushern?” She then proceeded to open ‘her book’ and to discuss with me all the various businesses in the county that would be important in the future. This included the space industry companies, as well as the industry associations such as the MSBR. It was a great tutorial.” This was the fourth time that Executive Baker has spoken to the MSBR.

Baker introduced Dr. Low, President of the University of Maryland. He began by thanking the audience for the work that they do and to thank industry for supporting and funding STEM-related efforts, such as the FIRST Robotics Challenge, that have helped so many school children. He then said, “I am in the immortality business. I do this by enabling people to achieve their potential through higher education. Also note that I am wearing a Baby Turtle lapel pin”. He then pointed to a table where the Oxon Hill High School Robotics Team, who had recently won a first place award at the local FIRST

Robotics Competition, sat. “When you are ready for college, I want you to think of the University of Maryland”. To this he received a big round of applause. Dr. Low finished by citing the investments that are being made in the University, the Route 1 corridor, and in College Park in general, in order to maintain UMD and College Park as a premier university. Finally he introduced the Honorable Senator Mikulski by saying, “You’ve spent 19 years committed to programs like the Hubble Space Telescope – and I intend to work with you for another 19 months!” – a joke regarding the Senator’s recent announcement that she would not be running for another term.

After MSBR President Dr. Jingli Yang’s introduction, Mikulski began by recognizing the UMD sports program. “I’m a fan of the women Terps”, she said, referring to their recent successful run in the NCAA basketball tournament. “Some of the freshman senators call me “coach” too!” She went on to say “I love science, I love space, and I love you. As I got ready for re-election, I realized that it was an eight-year commitment at a 140% level – two for the campaign, and six for the [democratic] party. I asked myself ‘Who am I campaigning for?’ Should I be worried about my future, or your future? I then decided that I would rather spend the next two years raising hell – working for you!”

The Senator went on to acknowledge the industry/attendees in the room for their commitment to science, engineering, and education. “In whatever you do, you do it with duty-driven commitment and sacrifice. And it is because of that…it’s why we fight so hard.” She cited the great programs that came from, or are currently in development, here in the Maryland region – Hubble Space Telescope, APL’s New Horizons Pluto fly-by mission (“no matter what they call it – planet, asteroid, whatever”), the ISS Cargo Resupply missions from the Wallops Flight Facility, NOAA’s weather satellites (GOES and JPSS), the James Webb Space Telescope, and GSFC’s endeavors in earth science and heliophysics. She commented on the Republican Congress’ push to better fund Mars missions and human space exploration by emphasizing the importance of earth science – “We hope to find intelligent life on THIS planet! The House is focused on going to Mars – I want a balanced NASA agenda – one that includes Mars, Space Launch System, Earth science/Mission to Planet Earth. So to the House, I say ‘thanks much, we’ll take it from here”.

She was proud of 2015 accomplishments:

- $20M for Wallops for capital upgrades needed after the Antares explosion.
- $94M additional funding for Space Science missions.

She hopes to accomplish in 2016:

- Balanced NASA budget as noted above.
- She is hoping to add funding for Space Weather predictions, so that our national infrastructure has robust early warning of disruptive solar flares and other phenomena.
- Keeping Science budget at $5.3B, to fund LANDSAT-9 and Dark Energy probe, and to keep Wallops adequately funded.
- NOAA’s space programs must also be adequately funded.

- Restoring $300M to Earth Science which is said to be cut in Congressional subcommittees
- Completion of the James Webb Space Telescope (“HST is NOT a substitute!”)
- Completion of the Solar Probe Plus mission at the Applied Physics Lab.

She cited on-the-ground benefits of investments in space technologies, and how they have resulted in improved mammograms, laser eye surgery, and improved fire fighter safety. She went on to say, “I support satellite servicing – it’s an opportunity for a new business/industry to reuse, recycle, repurpose and to continue the usefulness [of on-orbit assets]. I am looking to you to maintain our momentum – go talk to your colleagues in the House and the Senate about [the importance] of maintaining our #1 standing in space programs.”

Senator Mikulski briefly addressed the technology threats from China: “I am asked ‘what can we do about China?’ The answer is that we can’t stop China, but we cannot stop ourselves. We must invest in education - for high quality, affordable schools, to enable our kids to go to school and not have to bribe someone, or be rich to do this. And to fund science and technology – to remain “exceptional” as a nation.

She closed her presentation by stating, “We’re in this together. I will fight for you in the Senate. And “may the force be with you!”

Our next luncheon on May19th will feature Manson Brown Vice Admiral, U.S. Coast Guard (ret.), Assistant Secretary of Commerce for Environmental Observation and Prediction, and NOAA Deputy Administrator. As Deputy Administrator, he plays a major role driving NOAA priorities for weather and water services, climate science, plus the agency’s integrated mapping and Earth-observing capabilities. His portfolio includes agency-wide direction for satellites, space weather, water, and ocean observations and forecasts to best serve American communities and businesses. We look forward to his remarks.

May 19th - National Oceanic and Atmospheric Administration Deputy AA Speaks of "Enabling Commerce" to the Roundtable

On May 19, the Maryland Space Business Roundtable hosted a luncheon at Martin's Crosswinds, Greenbelt MD, to hear the new Assistant Secretary for Environmental Observation and Prediction at NOAA, Manson Brown. Vice Admiral Brown is new to NOAA, after a 36+ year career in the Coast Guard. He discussed the overall goal of NOAA - "to ensure people have access to Commerce data to make well-informed decisions", and that NOAA's motto of "Open for Business" was consistent with their intent to take environmental data and convert this into "decision-making". NOAA helps communities to become more "resilient" - a key term at NOAA today – and deliver what they want, not what we think they need. He walked through several of the on-going missions that are sponsored by NOAA, including DSCOVR (where he visited the launch site and monitored the launch from the NSOF in Suitland MD), Jason-3, GOES-R (slated to launch in 2016), JPSS-1 (with a planned launch in early 2017), and COSMIC-2 satellite constellation, which provides radio occultation data.

He noted that "Extreme Weather" has been identified as the #2 biggest risk to the world, and the water crisis as the #1 impact (as seen today in California). NOAA satellite observations add to the understanding of these phenomena. He also noted many of us do not realize that the US has the broadest variety of extreme weather on Earth, and so the demand for weather intelligence continues to grow. Adm. Brown noted that NOAA is gathering ~20 TeraBytes of data every day and is partnering with Google, IBM, Amazon, and others to create five separate private/public partnerships to enable access to new data products in the cloud, and to help solve "the big data problem".

Finally, he compared the goals and missions of the Coast Guard and NOAA, stating that "they both are

consequential to the US, are not well known or understood, and must raise their levels of public awareness". Manson Brown closed by stating he is excited about the relevance of the NOAA mission to the future of the US and looks forward to working with the other direct reports to Dr. Kathy Sullivan (NOAA Administrator) to ensure NOAA remains relevant to the Administration and US commerce in general.

The MSBR Board is pleased to present Badri A. Younes Deputy Associate Administrator for Space Communications and Navigation (SCaN), NASA on Tuesday June 9, 2015. Mr. Younes manages the SCAN Program at NASA Headquarters and oversees all NASA telecommunications and navigation projects and networks, including NASA's Space Network (SN), Near-earth Network (NEN), and Deep Space Network (DSN). We look forward to seeing many of you on June 9th to hear Mr. Younes share his thoughts about SCaN and the future of navigation.

June 9th - We were delighted to have **Badri A. Younes, Deputy Associate Administrator for Space Communications and Navigation (SCaN), NASA** as our Speaker for the MSBR Luncheon held on June 9th. Thanks to all of our Members for attending this very informative session. Mr. Younes first discussed the number of people at NASA that have been working on the advancement of satellite communications over the last several years - he asked them to stand up and be recognized!

He outlined how the three systems (Near Earth Network, Space Network, and Deep Space Network) need to be upgraded to support new missions that will have significantly greater data rate requirements. The current systems and new satellite systems are limited by the communications bandwidth and a major push over the next several years is to mature new technologies to greatly increase the bandwidth. As an example, the Laser Communications Demonstration Relay Mission (LCRD) Program promises to deliver a significant improvement in data rates. The increased performance was demonstrated on the LADEE spacecraft which performed laser-based communications between the satellite orbiting the Moon and the Earth. The experiment demonstrated that very high data rate optical communications was viable. This will be critical to the planned NASA Exploration Program, which intends to put astronauts on Mars in the 2030s. The only way to do this is to first put in place a high data rate communications architecture for deep space - something that does not exist today.

We look forward to having you join us on Tuesday July 21, 2015 to listen to Dr. Piers Sellers speak. Dr. Sellers is the Deputy Director of the Sciences and Exploration Directorate and Acting Director of the Earth Sciences Division at NASA/GSFC. We are also excited to host 20 college interns from GSFC. If you have not already, please let us know with your reservation if you are willing to host one or two.

July 21st - Dr. Piers Sellers began his presentation by showing a varied and impressive set of computer simulations and climate data aggregation bringing together science data collected from land, atmospheric, and ocean observations and how this data begins to show us new realities and predictability associated with our Planet's climate. One video in particular showed the integration of atmosphere, ocean circulation, cloud patterns, ocean temperature variation, and other factors. Sellers then stated that the "climate change naysayers are losing the battle" based on the availability and irrefutability of the data expressed through these models and simulations.

In addressing the impacts of climate change, Sellers noted that based on long-term climate model predictions, the ***best*** case impact is a ***2-foot*** nominal sea level rise by 2100, with the less conservative worst case impact being a 3-foot rise. He noted that Dr. James Hansen's most recent predictions are showing a much worse effect in the next 50-150 years. The question then becomes – **what can we do about it?** He cited the ozone hole crisis of the 1970s, and how through international treaties, all countries banded together to find alternatives to Chlorofluorocarbons, commonly known as CFCs. The result was that the ozone hole has consistently reduced in size and projections now show that the ozone hole will be closed by the end of the century. We can do the same for gases that contribute to climate change.

This enlightening presentation is an example of topics near and dear to our heart our esteemed speakers bring to us each month. The MSBR is delighted to be an enabler in bringing such Speakers to our monthly luncheons.

August 25th **Congresswoman Donna Edwards** also spoke about topics close to home. She shared personal experiences about her engagement with the local Space community and her commitment to STEM.

After the introductions, Edwards noted that before she got her law degree, she had been an engineer, working on SpaceLab at GSFC, as an employee of Lockheed Martin.

She discussed her various initiatives in ensuring that STEM education opportunities were being created in Maryland. She has personally been involved in these types of initiatives and relayed several success stories that have come of our STEM outreach, particularly for woman and students of color. When speaking about STEM, she expressed concern that by the 4th grade STEM areas lose most girls and minorities and we need to reach them at a younger age to make an impact.

On the political side of things, Rep Edwards expressed her hopes of passing a CR to avoid sequestration.

Edwards has been a long-time supporter of GSFC, NASA, and the Space Business Roundtable, having spoken at the MSBR's 2014 evening Gala Event.

September 15th - Mr. Steve Jurczyk Associate Administrator for the Space Technology Mission (STM) Directorate NASA, opened the presentation by stating that the STM Directorate is focused on identifying and promoting technologies that will have a demonstrable benefit to future missions, primarily earth science missions. "I am a systems engineer, and that means if I find that the technology doesn't solve a problem, then it's not worth spending money on!" Mr. Jurczyk shared the levels of funding received by STM Directorate and how it is applied to Projects. As expected, final funding allocations are typically less than what is originally requested; this year STM received approximately $650 Mill against an original request of about $720 Mill. He noted that the money gets divided up in a fairly regular way. "First 40% goes to the Centers for their research/technology needs. The next 40% goes to what I call "Big Aerospace" – Large Corporations - Lockheed, Boeing, Aerojet, Northrop Grumman. The next 12% goes to Universities, and the final amount goes to what I call "Small Aerospace" - SpaceX, Masten, Virgin, etc. that are working on commercial Space Projects".

Steve then outlined several of the major technology initiatives that STM is investing in now and into the future, including a discussion of which missions these technologies would benefit. For instance, Space Electric Propulsion (SEP) is an enabling technology for the Asteroid Redirect Mission. Other areas include space laser communications (noting the Laser Communications Relay Mission on-going at GSFC), in-situ resource utilization, space power systems, ECLS, inflatable structures, and large re-entry deceleration systems. Steve showed videos of the recent Low Density Supersonic Decelerator (LSDS) Technology Demonstration test flight that took place out of Kauai, Hawaii. The balloon, launched by the Wallops Flight Facility Team, took the LSDS experiment up to a 120,000 foot altitude, then released the experiment. The Inflatable deceleration systems worked nominally, the deployable balloon worked flawlessly, but the supersonic parachute ripped and destroyed itself in less than one second after deployment. "Clearly we have more work to do before the next experiment flight" laughed Mr. Jurcvzyk. When asked if there would be a follow-on flight for LSDS, Mr. Jurczyk stating "the definitive answer is 'maybe'!"

Steve had a captive audience as he shared the achievements and plans for the STM Directorate and

once again the MSBR was glad to have Steve join us at our Luncheon.

We look forward to our **October** luncheon around the corner on the **6th** as we **feature Dr. Antonio J. "Tony" Busalacchi Chair, University of Maryland Council on the Environment, Director and Professor, Earth System Science Interdisciplinary Center (ESSIC).** Tony has been selected by the National Academies to Co-chair the Steering committee of the Earth Science Decadal Survey 2017.

As a prelude to the luncheon and featured speaker, we would like to share that the National Research Council (NRC), led by the Space Studies Board in collaboration with other Earth Science related boards across the NRC, will organize a "decadal survey" that will generate consensus recommendations from the environmental monitoring and Earth science and applications community on an integrated and sustainable approach to the conduct of the U.S. government's civilian space-based Earth-system science programs. These programs are carried out predominantly by the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), and the United State Geological Survey (USGS), with supporting and complementary contributions from agencies including the National Science Foundation (NSF), Department of Agriculture (USDA), Department of Energy (DoE), and Department of Defense (DoD).

The National Research Council (NRC) is the working arm of the United States National Academies, which produces reports that shape policies, inform public opinion, and advance the pursuit of science, engineering, and medicine.

To learn more about the study and survey, go to http://sites.nationalacademies.org/SSB/CurrentProjects/SSB_166359. We look forward to having you join us at the Luncheon and hear Dr. Busalacchi speak.

October 6, Dr. Dava Newman, NASA Deputy Administrator - On October 6, 2015, the Maryland Space Business Roundtable was honored to have the Deputy Administrator of the National Aeronautics and Space Administration (NASA), Dr. Dava Newman, join us as our featured speaker. Dr. Newman was nominated in January 2015 by President Barack Obama and confirmed by the U.S. Senate in April 2015 to serve as the Deputy Administrator NASA. She was sworn in on May 15 and began her duties with the agency on May 18. Along with NASA Administrator Charles Bolden, Newman is responsible for providing overall leadership, planning, and policy direction for NASA. Prior to her tenure with NASA, Newman was the Apollo Program Professor of Astronautics at the Massachusetts Institute of Technology (MIT) in Cambridge. Her expertise is in multidisciplinary research that encompasses aerospace biomedical engineering.

As a student at MIT, Newman earned her Ph.D. in aerospace biomedical engineering in 1992 and Master of Science degrees in aerospace engineering and technology and policy in 1989. She earned her Bachelor of Science degree aerospace engineering from the University of Notre Dame in 1986.

Dr. Newman gave an inspirational speech on the current state and future direction of the nation's space program, especially as it relates to Maryland.

Dr. Newman identified with Maryland, and referred to it by one of the State's slogans of "America in Miniature" by saying Maryland is the "Space Program in Miniature". She discussed the great concentration of government labs, academic institutions and aerospace companies in the area, calling out the University of Maryland, Johns Hopkins, Morgan State, Bowie State, JHU Applied Physics Lab (she's a "huge Pluto fan"), and Goddard Space Flight Center and supporting companies. She also commended the "awesome" Maryland Congressional Delegation and quoted Senator Mikulski, "People make a difference, but people together make change."

Dr. Newman addressed the future of space exploration at length, saying that “moving into the universe tells us about ourselves.” She said we need every boy and girl needs to be think of space careers as inspiring, enabling, and empowering. NASA is moving closer towards sending manned missions to Mars and the nation has never been closer than it is now. She called on the audience to read their plan on the NASA website (http://www.nasa.gov/sites/default/files/atoms/files/journey-to-mars-next-steps-20151008_508.pdf), understand how we all can contribute, and then we can see how “together we’ll make change.”