

Behind the E/PO Scenes with Kristen Weaver

Over two weeks in July 2015, Kristen Weaver worked with elementary school teachers who were part of the Summer Watershed Institute, led a session for 15 educators on how NASA studies hurricanes, and presented to 22 middle school teachers on the GPM mission and science background. Global Precipitation Measurement (GPM) is an international satellite mission to provide observations of rain and snow worldwide every three hours. NASA and JAXA (the Japanese Aerospace Exploration Agency) launched the GPM Core Observatory satellite on February 27, 2014. As an Education Specialist for GPM, Kristen prepares for, presents at, supports or leads sessions, workshops, conferences and events. Her enthusiasm, curiosity and professionalism are assets for working in public outreach. In late September 2015, Kristen was recognized with a Contractor Award for “outstanding service and innovation as a GPM education and communication specialist” (*see Awards*). A lifelong interest, from Space Camp to Goddard, has provided a path that remains exciting and rewarding for Kristen to share her passion with others. She recently discussed with us some different facets of public outreach, including products, events and collaboration.

GPM Launch Kit

We asked about her experience of watching the GPM launch and the efforts that went into GPM Launch Parties: GPM’s launch was the first of the five Earth science launches during a one-year period. It was an incredible experience to be part of such an event. As a kid, I attended Space Camp in Huntsville, Alabama, and decided I wanted to be one of the first astronauts on Mars. I shifted direction when I went into teaching, and never imagined I would have the opportunity to work for NASA. The launch party was a group effort between the GPM core team and others from communications. We based the launch kit on one developed for the Landsat 8 launch, and determined what resources to make available online so folks could host their own launch parties. For the larger event at Goddard, I drew on my experience as a middle school teacher helping to run Family Science Nights. We developed a plan for a large group of attendees to flow from activity to activity.

GPM Anime Comic Book

In Spring 2013 the GPM E/PO team launched the “GPM Anime Challenge” for artists to develop an anime character to help demonstrate GPM educational science themes. The resulting story titled “Raindrop Tales: GPM Meets Mizu-chan” features the two grand prize winners, introduces readers to GPM and explains why it is important to study precipitation from space. The comic was first distributed at the Explore@NASAGoddard event in late September. (See: <http://gpm.nasa.gov/education/comics>.) We inquired about the contest, the comic and the target audience: As a middle school teacher, Dorian Janney, the senior GPM Education and Communication Specialist on the team, had noticed kids drawing comics; girls especially would draw anime-style characters. She had the idea to connect that interest in anime with the mission, and attract the interest of young people to STEM. After I started as a GPM Education Specialist in September 2013, I was assigned as the lead for taking the project to the next step, creating a comic book using the characters. Given the difficulty level of the comic’s language and content, the target audience is primarily middle and high school students, but older elementary students can enjoy it with the proper support. We will be distributing the comic at AGU in San Francisco in December, to educators, scientists and engineers.

(cont’d on page 2)



Image Credit: NASA

(Weaver, cont'd)

GPM-GLOBE Event

The Global Learning and Observations to Benefit the Environment (GLOBE) Program, an international science and education program, provides students and people worldwide the opportunity to participate in data collection and the scientific process. In 2015, Kristen was involved in the GPM-GLOBE kickoff event with kids setting up their own rain gauges: The hope is that by performing their own data collection, students' investigations will be more meaningful and will help them see themselves as citizen scientists (<http://www.globe.gov/web/gpm>). It's one thing to look online and find that over an inch of rain was reported in your area, and another to go outside and actually see that the inner tube of the rain gauge has overflowed.

Public Events

The GPM Outreach Team works events of all sizes, from Earth Day on the Mall to Explore@NASA Goddard. What engages adults and kids alike? We often have hands-on activities to draw people in, like a water cycle model with actual water or assembling the pieces of the satellite. A helpful phrase is "hands-on, minds-on" - the activity can be the hook, but kids have to be thinking, questioning, wondering about what's behind the activity. Onsite, we use visuals created by the Scientific Visualization Studio (SVS) and others to explain how the satellite measures precipitation. Many concepts are clearer when they are visual. Questions from the public range from general (how the satellite works) to more detailed (results to date). People are often curious about what happens to the satellite when the mission ends. For Explore@NASA Goddard and Take Your Child to Work Day, I'm impressed by how many people bring their kids to explore science. Every time I work at an event, somebody asks me a new question I haven't heard before. I like that - it keeps things interesting.

GPM Master Teachers/Earth SySTEM Ambassadors

Kristen and Dorian Janney work with educators and teachers to incorporate GPM into their curriculum. We asked about that process and about the GPM Master Teacher program: We work with teachers in-person and through webinars; Dorian sends out resources for teachers to review beforehand. My role is mainly a support role, helping with the collaboration workspace and the technical logistics of running these monthly meetings, and fielding tech or data access questions. They provide input on newly created activities and resources (i.e., the GPM comic book). The GPM Master Teacher program was recently renamed the Earth SySTEM Ambassadors, to broaden it from solely GPM to more Earth science, in line with the new direction of education within the Science Mission Directorate. Ambassadors are experienced educators (levels K-12) with involvement in professional learning communities who can share what they learn about GPM with colleagues. Others are informal educators from museums, nature centers, etc.

Personal Insight

Of course, we wondered what initially interested Kristen in Earth science: I've always been interested in making observations about the world around me, seeing curious things and trying to figure out what's going on. Not long ago, in a box of memorabilia from my parents, I found one of those "All About Me" books in which I wrote "nature scientist" for what I wanted to do when I grew up. This was before Space Camp, and I decided I wanted to go to Mars instead. As an undergrad, I studied computer science and psychology, and ultimately switched to teaching. In 2005, when I started teaching 6th grade math and science in Denver Public Schools, I was excited that the entire science curriculum was Earth science. Earth science is a great hook for learning - kids have all experienced weather phenomena, watched clouds, or at least been outside in different conditions, so there is already a good foundation of knowledge to build upon.

Spotlight: Ten Years of Ticosonde

July 8, 2015 marks ten years since the start of the NASA Ticosonde project, a regular series of balloon soundings in Costa Rica to measure water vapor and ozone up to the middle stratosphere (~30 km). The water vapor soundings, obtained with the Cryogenic Frostpoint Hygrometer (CFH), comprise the longest-running set of in situ measurements of water vapor in the upper troposphere and lower stratosphere (UT/LS) in the tropics. Ticosonde CFH measurements have played a critical role in validating the Aura MLS water vapor measurements and provide a means to monitor the long-term evolution of UT/LS water vapor and to investigate its impact on global climate. Ticosonde also contributes ozone sonde measurements to the Southern Hemisphere Additional Ozone Sondes (SHADOZ) network, and in the last two years Ticosonde has been launching a dual-ozone sonde payload to measure sulfur dioxide emissions from the nearby Turrialba volcano. These SO₂ profiles are being used by the NASA OMI team to validate their remote-sensing measurements of SO₂.

Henry Selkirk, Principal Investigator for Ticosonde, and his collaborator Holger Vömel (NCAR) returned from a visit this summer to San José, Costa Rica where they met with Ticosonde Co-PI Dr. Jorge Andrés Díaz and his launch team at the Universidad de Costa Rica. Among the highlights of their visit were discussions of joint water vapor measurements with the Costa Rican meteorological service (Instituto Meteorológico Nacional), the initiation of a collaboration to study emissions from Volcán Turrialba with scientists at OVSICORI, the Costa Rican volcanologi-

cal and seismological institute, and a dinner with present and past members of the Ticosonde team to celebrate the project's 10th anniversary. In late July, both Dr. Selkirk and Dr. Vömel gave presentations on the results from the first decade of Ticosonde to the Composition and Transport in the Tropical Troposphere and Lower Stratosphere (CT3LS) Meeting in Boulder, CO. Ticosonde data are available from the Aura Validation Data Center (<http://avdc.gsfc.nasa.gov>). (Note: The editor thanks Dr. Selkirk for contributing this highlight.)

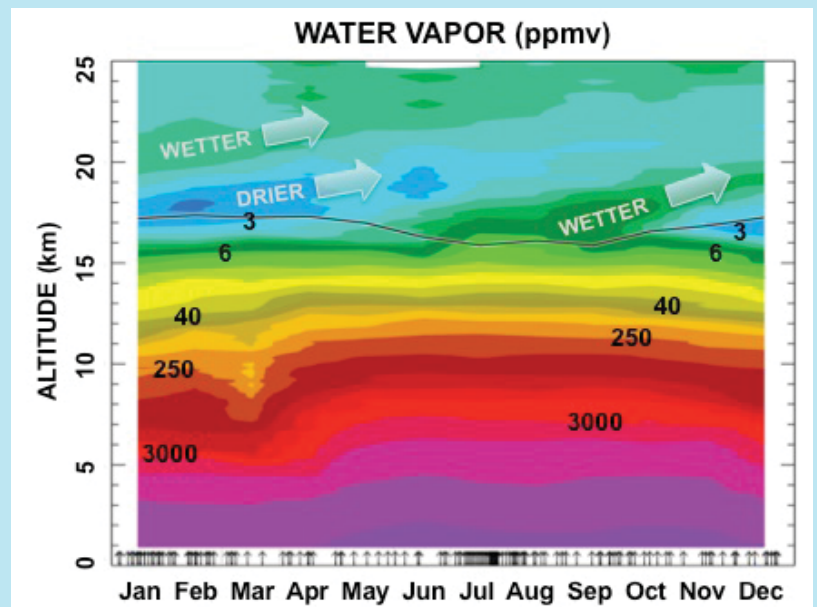


Figure: Composite annual cycle of water vapor mixing ratio at San José, Costa Rica obtained from balloon-borne CFH measurements, 2005-2015. The local cold point tropopause is shown as a black line crossing the figure near 17 km. Image Credit: H. Selkirk

Deep Blue is Now Online

The Deep Blue Multi-Sensor Aerosol Project uses measurements made by satellite instruments orbiting the Earth to determine the amount of aerosols in the atmosphere, and the properties of those aerosols. According to Andy Sayer, member of the Deep Blue algorithm team, "Aerosols" is a catch-all term covering particles suspended in the atmosphere, including but not limited to desert dust, smoke, volcanic ash, industrial smog, and sea spray. Improving our understanding of aerosols is important for reasons related to Earth's climate, human health, and ecology, as well as many others."

As of summer 2015, Deep Blue has its own website: <http://deepblue.gsfc.nasa.gov/>. Not only is this site a single resource for the various Deep Blue satellite aerosol data products (e.g., SeaWiFS, MODIS, VIIRS), it also includes information and links related to the data products, as well as background information on aerosols and aerosol remote sensing for the non-specialist. Subscribers to the available RSS feed can obtain project updates. Of note, this page was created with the support of three interns from NASA's high school internship program. For further information about the website or Deep Blue, contact Dr. Sayer (andrew.sayer@nasa.gov).

AERONET in the News

AERONET (AERosol RObotic NETwork), a network of ground-based sun photometers, measures atmospheric aerosol properties. All of AERONET's products produce an average of the total aerosol column in the atmosphere. Various types of aerosols can affect Earth's climate, such as dust from deserts, man-made aerosols, and volcanic aerosols. According to a nasa.gov article, "Aerosols are minute particles suspended in the atmosphere. When these particles are sufficiently large, we notice their presence as they scatter and absorb sunlight. Their scattering of sunlight can reduce visibility (haze) and redden sunrises and sunsets. Aerosols interact both directly and indirectly with the Earth's radiation budget and climate. As a direct effect, the aerosols scatter sunlight directly back into space. As an indirect effect, aerosols in the lower atmosphere can modify the size of cloud particles, changing how the clouds reflect and absorb sunlight, thereby affecting the Earth's energy budget." AERONET campaigns began in the early 1990s with SCAR (Smoke/Sulfates, Clouds and Radiation) and continue today, most recently with DRAGON (Distributed Regional Aerosol Gridded Observation Networks) which lasted 2011-2014 and had field campaigns in the Baltimore/DC region, Japan and South Korea, Southeast Asia (7-SEAS), San Joaquin, Cali., Germany, Houston, TX, Southeast U.S. (SEAC4RS), and Colorado.

From South Korea to Greenbelt

Tom Eck has published as both lead and co-author several papers on aerosol research and campaigns, and was part of the DRAGON-Korea field campaign in 2012, where AERONET had 22 sites in South Korea. A similar amount of sites in South Korea has been proposed for the upcoming 2016 KORUS-AQ campaign, a NASA/Korean field experiment. Along with Brent Holben (AERONET Project Lead), Mr. Eck is a team member on AERONET, one of the KORUS-AQ Instrument Teams. This past October, South Korean President Park Geun-hye visited NASA Goddard on her recent trip to the U.S. Ten NASA GSFC projects were chosen for short talks to be presented to her during the visit. Mr. Eck gave the AERONET presentation to President Park, who was accompanied by GSFC Director Christopher Scolese, emphasizing these Korean field campaigns and the project's collaborations with key Korean researchers in Yonsei University, Seoul National University and other Korean institutions. The

wife of Maryland Governor Larry Hogan, Yumi Hogan, also attended this event.

From Ghana to Greenbelt

On September 17, 2015, the President of All Nations University College (ANUC) from Koforidua, Ghana along with colleagues traveled to NASA Goddard Space Flight Center to sign an AERONET agreement between NASA and ANUC. NASA will establish an AERONET ground station at ANUC to measure the aerosol column over the region. According to Richard Damoah, who acted as the point of contact at GSFC, "Another part of this agreement is that research collaborations will be developed, and an exchange of researchers between the institutions can be implemented. Also, ANUC faculty will be able to develop research projects from the data, and data from the instrument will help with validation of other NASA satellites. This is very exciting for ANUC and the country; in fact, this agreement is the only one ever signed between NASA and any institution in Ghana." (For more information, see GESTAR Newsletter, Spring 2015.)



NASA/ANUC AERONET Agreement Signing at NASA GSFC: (back row) Dr. Antony Kinyua (MSU Physics Dept.), Charles Gatebe (GESTAR/USRA), Charles Ichoku (NASA/GSFC); (seated) Richard Damoah (GESTAR/MSU), Dr. Samuel Donkor (ANUC President), Brent Holben (NASA/GSFC). (Image provided by R. Damoah)

Best of Goddard Film Festival

Curated by **Genna Duberstein**, the annual Best of Goddard Film Festival had a summer screening this year, on July 15th, the idea being to hold the festival while the summer students were onsite at NASA Goddard. Another change to this year's festival: there was no voting on a "winner". The entries that include GESTAR members is listed below, and all entries can be viewed here: https://www.youtube.com/playlist?list=PL_8hVmWnP_O0XWDIAI7kwYwE-f3bfgWDA.

What are the Chances of Another Katrina? **Joy Ng**, Producer and Animator, **Jefferson Beck**, Producer

5-Year Time-Lapse of the Sun **Genna Duberstein**, Lead Producer and Editor

Earth from Orbit 2014, a compilation video of images from the Earth Observatory's Image of the Day Project Support by **Eric Sokolowsky**; Lead Producer **Jefferson Beck**

Goddard's Speedy MMS Instruments will Measure Mysterious Physics Project Support by **Genna Duberstein**

Satellite Tracks Saharan Dust to Amazon in 3-D **Joy Ng**, Producer and Narrator; **Kayvon Sharghi**, Producer; **Kel Elkins**, Data Visualizer; **Brian Monroe**, Animator

SDO: Year 5, a compilation video of Highlights from the Solar Dynamics Observatory's five years of watching the sun **Scott Wiessinger**, Lead Director, Lead Producer and Lead Editor; **Tom Bridgman**, Lead Data Visualizer

SMAP Radiometer versus Radio Frequency Interference **Matthew Radcliff**, Lead Producer and Video Editor; **Brian Monroe**, Animator

Greenland's Ice Layers Mapped in 3D **Cindy Starr**, Lead Animator and Narration; **Jefferson Beck**, Producer, Video Editor and Narration

Missions Take an Unparalleled Look into Superstar Eta Carinae **Scott Wiessinger**, Producer, Narrator, Video Editor, Writer; **Brian Monroe**, Animator

Asteroid Bennu's Journey **Michael Lentz**, Lead Animator, Video Editor and Writer; **Dan Gallagher**, Producer and Writer

Understanding Lunar Eclipses **Ernie Wright**, Lead Animator; **Dan Gallagher**, Video Editor and Producer

The Mysterious Holes in the Atmosphere on Venus **Brian Monroe**, Lead Animator; **Genna Duberstein**, Video Editor and Producer



2015 Film Festival Poster, designed by Brian Monroe. (Image provided by Genna Duberstein.)

NASA Science Jamboree

Researchers and scientists from all of NASA Goddard were on-hand at this summer's Science Jamboree, held in the Atrium of Building 28 on July 8th. From geology to landslides to space weather to earth science, plus hyperwall presentations in the NCCS Data Exploration Theater and the latest from the Office of Communications and more, the Jamboree provided an inside look at the breadth of research that is happening at GSFC, as well as the opportunity to speak one-on-one with individuals from several laboratories. Other events included a life-size model of the MMS Mission Observatory and a tour of the Flight Dynamics Facility. GESTAR members who staffed the GMAO table included **Abhishek Chatterjee**, **Brad Weir**, **Clara Draper** and **Qing Liang**.



David Lagomasino (Code 618) with his presentation “What is the Sound of Environmental Change?” (Photo: A. Houghton)



Brad Weir (Code 610.1) discusses his research with Science Jamboree attendees. (Photo: A. Houghton)



Thomas Stanley (Code 617) with colleague Sujay Kumar (GSFC/SAIC, 617), at their demonstration regarding mudslides. (Photo: A. Houghton)

maniac talk

GESTAR thanks the following scientists for presenting these past few months: *Marshall Shepherd* (July); *Frank J. Cepollina* (August); *Neil Gehrels* (September). *No talk was held in October. Upcoming talks are posted on the Maniac Talk site (<http://maniac-talk.gestar.usra.edu/>) or at the SED Highlights page (<http://science.gsfc.nasa.gov/sed/>). Thanks to **Charles Gatebe** and **Bill Hrybyk** for their ongoing efforts.

Young Scientist Forum

On July 14-15, the 2015 Young Scientist Forum was held, and consisted of oral sessions, poster sessions, and a Q&A session with senior scientists and management. While prior forums were focused solely on atmospheric science, this year it was expanded to include scientists from all GSFC Earth Science laboratories. Members of the Forum Committee were **Manuela Girotto** (610.1), John Yorks (612), Tianle Yuan (613), **Jie Gong** (613), **Valentina Aquila** (614), Christine Dow (615), Aimee Neeley (616), Jamon Van Den Hoek (618) and Nima Pahlevan (619).

The forum consisted of five sessions on the 14th and four on the 15th. GESTAR scientists who participated as Session Chairs and Presenters were as follows: on July 14th, **Valentina Aquila** chaired Session 2, “Comparisons Between Model and Remote Sensing Data” and **Manuela Girotto** chaired Session 3, “Assimilating Data into Global Climate Models”. On July 15th, **Jie Gong** chaired Session 3, “Active Remote Sensing Observations and Techniques”.

On July 14th, presenters from GESTAR consisted of **Sarah Strode** (614), “Trends and Variability in Surface Ozone over the United States”; **Junhua Liu** (614), “Origins of Tropospheric Ozone Interannual Variation Over Réunion: A Model Investigation”; **Edward Nowotnick** (614), “A Preliminary Evaluation of CATS Aerosol Typing”; **Gabrielle de Lannoy** (610.1), “SMOS and SMAP Brightness Temperature Data Assimilation into the GEOS-5 Catchment Land Surface Model for Soil Moisture Estimation”; **Abhishek Chatterjee** (610.1), “Development and Implementation of GEOCAS (Goddard Earth Observing Carbon Assimilation System) for the Orbiting Carbon Observa-

tory-2 Mission”; **Daniel Holdaway** (610.1), “Investigating sensitivity to Saharan dust in tropical cyclone formation using the adjoint of GEOS-5”; **Patricia Castellanos** (610.1), “An Observing System Simulation Experiment for TEMPO: first results”; **Cynthia Randles** (614), “Use of the NASA GEOS-5 SEAC4RS meteorological and aerosol reanalysis for assessing simulated aerosol optical properties as a function of smoke age”; and **Sergey Korkin** (613), “SORD: a new successive orders of scatter polarized RT code”.

July 15th GESTAR presenters included **Manisha Ganeshan** (613), “An investigation of the Arctic inversion using COSMIC RO observations”; **Kerry Meyer** (613), “An imager-based retrieval of above-cloud absorbing aerosol optical depth and the optical and microphysical properties of underlying marine stratocumulus clouds”; **Hiren Jethva** (614), “Validating above-cloud aerosol optical depth retrieved from MODIS-based ‘Color Ratio’ algorithm using NASA’s airborne AATS and 4-STAR direct measurements”; **David Lagomasino** (618), “Stereoscopic High Resolution Canopy Height: Toward a Validation for Global Coverage”; **Batuhan Osmanoglu** (618), “Radio Frequency Interference Detection and Mitigation Techniques: EcoSAR 2014 Flight Campaign”; **Allison Collow** (610.1), “The Correlation between Meridional Winds and Extreme Events over the United States”; **Jie Gong** (613), “Frozen Particle Microphysical Processes inferred from GMI-DPR Observations”; **Thomas Stanley** (617), “The Fire Mass Movement in Appalachian Spring”; and **Ivona Cetinic** (616), “FRACEX: Understanding the Effects of Phytoplankton Size on Optical Properties”.

New Hires

GESTAR welcomes the following members:

Nathan Arnold
Joanna Pelc
Monique Walker
Clara Orbe
David Trossman
Eunjee Lee
Zbynek Malenovsky

Moving On

Hank Margolis (IMSG) – has accepted a civil servant position

Manika Gupta (USRA) – has joined the NPP at Goddard

Proposals Awarded

NASA ROSES Proposal Awarded:

“GeoTASO Measurements of Aerosols and Tropospheric NO₂, O₃, CH₂O, and SO₂ Vertical Column Density (VCD) in support of KORUS-AQ”, PI: Scott Janz; Co-Investigators: **Lok Lamsal** (GESTAR/USRA), Xiong Liu, Jun Wang, Caroline Nowlan, **Matthew Kowalewski** (GESTAR/USRA), and **Melanie Follette-Cook** (GESTAR/MSU). (Note, KORUS-AQ is discussed in the AERONET section of this newsletter.)

“CubeRRT: CubeSat Radiometer Radio Frequency Interference Technology Validation” 3-year Proposal Awarded:

PI: Joel Johnson (The Ohio State University) and several Co-investigators and Collaborators, including researchers from NASA/JPL, NASA/GSFC, University of Michigan-Ann Arbor, and the Ohio State University Research Foundation, with **Priscilla Mohammed** (GESTAR/MSU) and **Jinzheng Peng** (GESTAR/USRA).

NASA Science Innovation Fund (SIF) Proposal Awarded:

“Towards a Database of Volcanic Ash Optical and Chemical Properties to Support Remote Sensing and Modeling for Earth and Planetary Applications.” Proposal Team includes Peter Colarco (GSFC/614), **Valentina Aquila** (GESTAR/JHU), and Nickolay Krotkov (GSFC/614), along with Jake Bleacher, Brent Garry, and Patrick Whelley (all of 698) and Kelsey Young (UMD/690).

Lunar Eclipse

Revisit the September 27th Lunar Eclipse via the LRO in this science visualization created by **Ernie Wright**, **David Ladd** and **Michelle Handleman**, along with two NASA GSFC scientists, Noah Petro and John Keller. Click here:

<http://svs.gsfc.nasa.gov/cgi-bin/details.cgi?aid=4356&button=recent>.



Goddard Awards

At the 2015 Hydrospheric and Biospheric Sciences (HOBI) Annual Awards Ceremony in late August, **Batuhan Osmanoglu** (Code 618) was recognized for Scientific/Technical Support, and received his award “for his dedication to the EcoSAR and DBSAR instrument development and data processing.” Developed at NASA GSFC, EcoSAR is a P-band airborne radar instrument for the polarimetric and interferometric measurements of ecosystem structure and biomass, and DBSAR is an L-band airborne sensor that tests digital beamforming radar techniques (DBSAR can also operate as a scatterometer and as an altimeter).

A month later, on September 25th, at the 2015 610AT Contractor and Partners Awards Ceremony, three GESTAR members received 610AT awards. **Kristen Weaver** was recognized for Outstanding Performance – Scientific Communication “for outstanding service and innovation as a GPM education and communication specialist.” **Kerry Meyer** was recognized for Best Senior Author Publication “for pioneering a paper showing that simultaneous retrievals of clouds and overlying aerosols are possible from MODIS.” And, **Lok Lamsal** was recognized for Outstanding Performance – Science “for outstanding scientific contributions leading to improving quality and widespread use of NASA nitrogen dioxide (NO₂) pollution data.”

MSU Student Researchers Poster Session

In August, GESTAR held an All Hands Meeting to review and discuss policies, business matters, progress and staffing. Prior to the meeting, Morgan State University student researchers held an informal poster presentation; several of these posters also had been presented at the NASA Goddard Summer Intern Poster Session. GESTAR recognizes the outstanding efforts of the students and scientists for working together on interesting research and informative presentations.

Ludovic Brucker: Camilo Diaz and Claudio Sidi

Sidi, C., and L. Brucker, "Analysis of snow dielectric constants in a microwave radiative transfer model"

Diaz, C., and L. Brucker, "Measuring Snow Depth on top of Arctic Sea Ice"

Richard Damoah: Bashan Prah, Chante' Vines, Kianna Spencer

Prah, B., C. Vines, K. Spencer, R. Damoah, A. Kinyua (MSU/Physics Dept.), and D. Seifu (MSU/Physics Dept.), "Preliminary Analysis of Morgan State University Weather Station Data"

Vines, C., R. Damoah, A. Anyamba (GESTAR/USRA), and A. Kinyua (MSU/Physics Dept.), "Climate Analyses for the Transmission of Vector-borne Diseases in Kenya"

Maggie Hurwitz: Roshelle Bailey

Bailey, R., and M. Hurwitz, "Interning at Goddard"

Batuhan Osmanoglu: Ozaveshe Daniyan

Daniyan, O., and B. Osmanoglu, "Simulating DBSAR-2 Transceiver Modules in Advanced Design Systems"

Matthew Kowalewski: Alexander Newman and Ahmed Abdelmohssen

Newman, A., and M. Kowalewski, "Prototype HelioStat for Earth Science Measurement"

Abdelmohssen, A., and M. Kowalewski, "GCAS Thermal Control in Lab"



MSU Student Researchers, Aug 2015 (left to right): Cherif Haidara, Ahmed Abdelmohssen, Alexander Newman, Kianna Spencer, Bashan Prah, Roshelle Bailey, Chante' Vines, Tunji Ogiefu, Claudio Sidi, Ozaveshe Daniyan and Camilo Diaz. (Photo: A. Houghton)

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**Follow-up to June publication:*

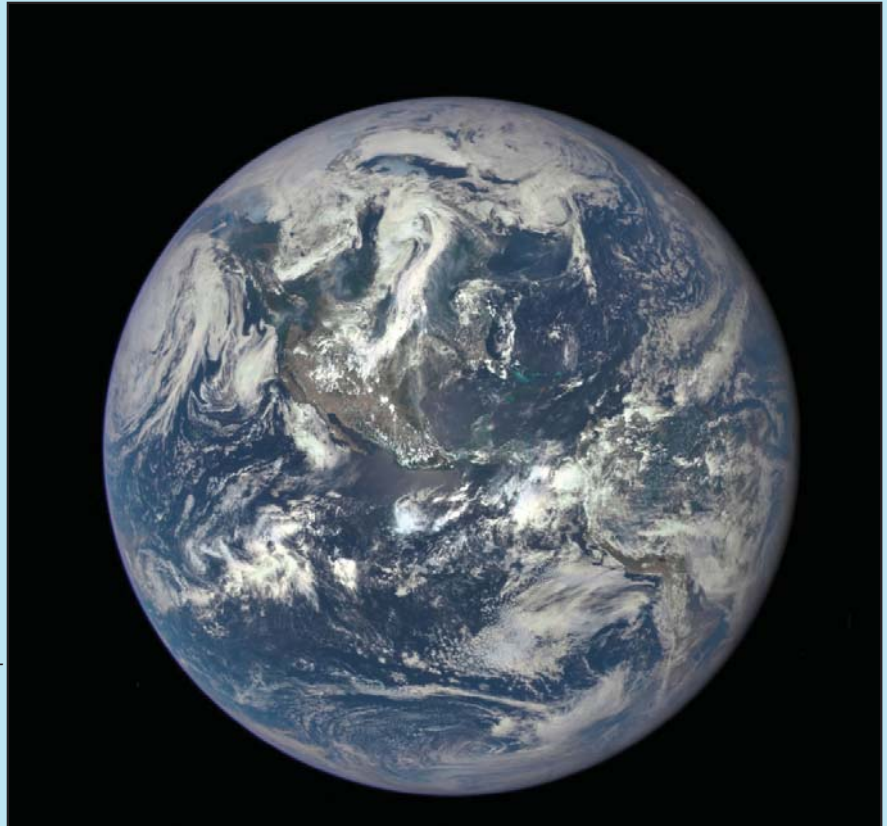
Tepei Yasunari (formerly GESTAR/USRA/613, now with Hokkaido University) was featured in a July 2015 Goddard Media Studios production entitled “NASA Scientists Link Earlier Melting of Snow to Dark Aerosols”, found here: <http://svs.gsfc.nasa.gov/cgi-bin/details.cgi?aid=11899>. His original JGR-Atmos. publication titled “Impact of snow darkening via dust, black carbon, and organic carbon on boreal spring climate in the Earth system” can be found here: <http://dx.doi.org/10.1002/2014JD022977>.

Upcoming Conferences:

American Geophysical Union Fall Meeting, San Francisco, CA Dec 14-18, 2015
 American Meteorological Society Annual Meeting, New Orleans, LA Jan 10-14, 2016
 American Astronomical Society Meeting, Kissimmee, FL Jan 4-8, 2016

EPIC/DSCOVOR

On July 6th, this color image of a sunlit Earth from NASA's Earth Polychromatic Imaging Camera (EPIC) onboard the Deep Space Climate Observatory (DSCOVR) satellite was released, allowing us to view our planet from a million miles away. According to NASA.gov, "EPIC takes a series of 10 images using different narrowband filters -- from ultraviolet to near infrared -- to produce a variety of science products. The red, green and blue (RGB) channel images are used in Earth images." This first image was reminiscent of, but different from, the Blue Marble images because EPIC captures images simultaneously of the Earth in its entirety. From its location at the L-1 point (Earth-Sun Lagrange-1), EPIC will provide a unique perspective for use in measuring ozone, aerosols, cloud reflectivity, cloud height, vegetation properties, and UV radiation estimates at Earth's surface. EPIC has its own website, providing views of Earth at any time of the day: <http://epic.gsfc.nasa.gov/>.



Throughout this past year, GESTAR researchers **Yuekui Yang**, **Kerry Meyer** and **Daniel Holdaway** have actively participated in the DSCOVR pre- and post-launch activities. Dr. Yang has been working on the DSCOVR-EPIC RGB image generation and data quality check. He is the PI for the EPIC cloud algorithm, for which Dr. Meyer is a co-I and Dr. Holdaway is an active collaborator. **Alexander Cede** also was involved with EPIC, examining and incorporating the optical model, analyzing data and exploring calibration differences, among other objectives.

The DSCOVR ground system development and test team was recognized by NASA, and each member received a NASA Group Achievement Award, signed by NASA Administrator Charles Bolden. As part of this team, **Yuekui Yang** received a certificate with this citation: "For outstanding effort in developing and testing the DSCOVR ground system under extenuating circumstances and limited resources and time".

The GESTAR Team: Universities Space Research Association (USRA), Morgan State University (MSU), I.M. Systems Group (IMSG), Johns Hopkins University (JHU), Global Science & Technology, Inc.(GST), Institute for Global Environmental Strategies (IGES), and Ball Aerospace and Technologies.

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The GESTAR Newsletter is published by GESTAR/USRA. Any comments/suggestions/ideas can be forwarded to Amy Houghton, Editor at ahoughton@usra.edu.