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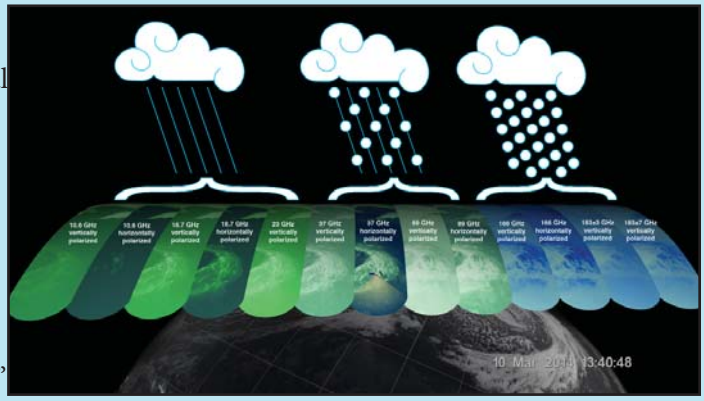
GPM: We have LIFTOFF!

On February 27, 2014, GPM was launched from Tanegashima Space Center in Japan. The GPM (Global Precipitation Mission) Core Observatory is the first of five Earth science launches planned for NASA for 2014, the other four being SMAP, or the Soil Moisture Active Passive satellite; OCO-2, the Orbiting Carbon Observatory-2; and two instruments for the International Space Station, the ISS-RapidScat instrument and The Cloud-Aerosol Transport System (CATS).

GPM is a joint NASA/JAXA (Japan Aerospace Exploration Agency) mission, whose objective is to study rain and snow around the world. Global data will be gathered every three hours from a constellation of orbiting international satellites. While each satellite may have its own objective, combined and along with the Core Observatory, all of this data contributes to greater accuracy in processing precipitation measurements. Information from GPM will have societal benefits and help to prepare for hydrologic modeling, predicting potential natural disasters, agricultural monitoring, and weather predictions.

The largest spacecraft ever assembled at NASA Goddard, the GPM Core Observatory contains two instruments, the Dual-frequency Precipitation Radar (DPR), developed by JAXA, and the GPM Microwave Imager (GMI), developed at NASA Goddard. The DPR's two frequencies are sensitive to different rain and snow particle sizes. From the DPR instrument, a 3-D structure of a storm can be constructed from signals that bounce off the raindrops and snowflakes. The GMI instrument has 13 channels, each one sensitive to a different precipitation type. "We still have a lot to learn about how rain and snow systems behave in the bigger Earth system," said GPM Project Scientist Gail Skofronick-Jackson (NASA/GSFC). "With the advanced instruments on the GPM Core Observatory, we will have for the first time frequent unified global observations of all types of precipitation." **Hyokyung Kim**'s research on the development of the spaceborne radar simulator contributed to the GPM mission, and helped the radar algorithm developers with testing and evaluating, and **Jiun-Dar Chern** will conduct simulations to provide a detailed cloud data set for GPM retrieval algorithm development teams.

On March 25, 2014, the first images captured by GPM were released, showing precipitation falling inside an extra-tropical cyclone over the northwest Pacific Ocean on March 10th. In the press release about these initial images, Dr. Skofronick-Jackson states, "I knew [from this high-quality data from GPM] we had entered a new era in measuring precipitation from space."



This image reflects each of GMI's 13 channels and each one's measurement of precipitation during the March 10th extra-tropical cyclone. (*Image Credit: NASA/JAXA*)

In anticipation of GPM's launch and to increase knowledge of this mission, several types of media were incorporated. **Eric Sokolowsky** assisted Dalia Kirschbaum (NASA/GSFC) with a GPM hyperwall presentation; **Heather Hanson** wrote a feature article on GPM for The Earth Observer Nov-Dec 2013 newsletter, and **Sally Bensusen** designed and constructed a GPM pocket folder. **Kristen Weaver**, GPM education specialist, leads and supports GPM-related activities, such as Rain EnGAUGE. The following is a selection of various GPM visualizations, animations, and interviews to peruse: GPM: For Good Measure (featured in the 5th Annual Goddard Film Festival); GPM: Our Wet Wide World; The Data Downpour; GPM: Meet the Team. **Ryan Fitzgibbons**, **Trent Schindler**, and **Ernie Wright**, along with **Alex Kekesi**, **Katie Lewis**, **Matt Radcliff** and **Silvia Stoyanova**, were involved with animating, editing, producing, writing, and narrating these and other GPM videos. To learn more about the GPM Mission, please visit the GPM Mission Page and the Precipitation Measurement Missions page.

GESTAR honors the late Dr. Arthur Hou, NASA Goddard Space Flight Center, GPM Mission Scientist.

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Awards Season

Several GESTAR scientists have been recognized for a variety of achievements since the last newsletter. Congratulations to all!

In Fall 2013, **Charles Malespin** received an award from the director of the Solar System exploration directorate (Code 690) "in recognition of [his] dedication and service to the NASA community". This award was presented to Dr. Malespin as well as other members of the SAM Team for their work on the Curiosity mission.

In December 2013, **Paolo de Matthaeis** and his sponsor received a Group Achievement Award presented to the "AQ Launch, Early Orbit Ops, and Commissioning Team" for "outstanding achievement in launching the AQ/SAC-D Observatory and commissioning the Aquarius instrument for unprecedented global sea surface salinity observations". Additionally, **Dr. de Matthaeis** received a Group Achievement Award as part of the Aquarius Science Calibration and Validation Team "for outstanding team efforts in calibrating and validating Aquarius science products in fulfillment of mission science objectives".

Also in December, **Assaf Anyamba** and his team were selected by the FDA Center for Food Safety and Applied Nutrition as the recipients of the 2013 FDA Leveraging/Collaboration Award as members of the Geospatial Produce Risk Assessment Modeling Team for exceptional achievement and collaboration to develop a geospatial risk assessment model to predict environmental produce contamination events. The FDA Leveraging/Collaboration Award recognizes an individual's or company's efforts to collaborate with other government or industry groups to advance the FDA's public health mission.

At Goddard's Climate and Radiation Laboratory Awards Ceremony in January 2014, four GESTAR scientists were recognized for Outstanding Technical Support/Achievement: **Benjamin Marchant**, **Kerry Meyer**, **Falguni Patadia**, and **Andy Sayer** were among several who received a Team Award presented to the MODIS Collection 6 Team "for sustained effort leading to the successful delivery of the MODIS Collection 6 algorithms and codes producing improved Levels 2 and 3 aerosol and cloud products". Additionally, for Best Author Paper, **Kerry Meyer** was recognized "for fundamental contributions to understanding the effect of above-cloud absorbing aerosols on the radiative forcing of coupled aerosol-cloud layers".

In late January, **Deepthi Achuthavarier** was recognized at the GMAO Peer Awards Ceremony for her contribution to the goals of the GMAO. She received the GMAO Peer Award for Scientific Achievement, "for contributing to our understanding of decadal climate variability in the North Pacific and its implications for improving the GEOS-5 coupled model."

Finally, **Charles Gatebe** is one of the recipients of the Robert H. Goddard Exceptional Award for Outreach "for founding, implementing, and continuing to lead the successful Maniac Talk series at NASA Goddard". This awards ceremony will be held on May 8, 2014 at 10:30 a.m. in the Bldg. 8 Auditorium.

Kudos!

NASA Goddard's Scientific Visualization Studio was awarded first place in the video category of the 2013 International Science and Engineering Visualization Challenge for its 4-minute entry titled "Excerpt from Dynamic Earth". The contest was sponsored by the journal Science and the NSF. This visualization is an excerpt from a full-length planetarium film called "Dynamic Earth", which has been shown worldwide; the visualizers conveyed the flow of solar wind and its effect on the atmosphere and ocean currents. The original video was created by Greg Shirah, **Tom Bridgman**, Horace Mitchell, Lori Perkins, **Cindy Starr**, **Ernie Wright**, **Trent Schindler**, and Stuart Snodgrass.

Winnie Humberson and **Steve Graham** of GST (Global Science & Technology, Inc.) received a letter of appreciation from NASA Administrator Charles Bolden for their work at the 2014 GEO Plenary and Ministerial Sum-

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mit. His letter was in response to a letter he received from Acting NOAA Administrator Dr. Kathryn Sullivan, recognizing NASA's efforts in Geneva. In particular, they were recognized "for their tireless work to produce an outstanding USGEO exhibit." According to Winnie, "our support consisted of organizing exhibits, organizing real time coordination for Hyperwall presentations, and networking with the local mission office for press, VIPs and students visiting the USGEO exhibit."

New Hires

GESTAR welcomes the following members:

Manuela Girotto, Scientist I
Beth Maginnis, Administrative Asst.
Stacey Kannon, Contracts Specialist

Moving On

Bob Bindschadler retired some time ago to the West Coast.

Felicia Chen, Lisa Potts (Contracts) and **Cuneyt Utku** are all pursuing various opportunities.

Students

Matt Kowalewski (GESTAR/Code 614) is working with **Osas Aimufua** and **Alexander Newman**, two students from Morgan State University (MSU).

Osas Aimufua, an Electric and Computer Engineering major with MSU's Electrical Engineering Department, is building a Source Monitor and Control System (SMaCS) for the optics lab. He is learning the LabView graphical programming language and interfacing a laptop to multiple pieces of hardware (power meters, filter wheels, power supplies) in order to create a user console capable of remotely operating, monitoring, and logging optical calibration sources. Osas also designed the mechanical hardware necessary to integrate the system together and interfaced with the machinists in its fabrication. While at NASA Goddard, Osas has been "learning new things and gaining exposure to so many things that I never got the chance to experience."

Osas Aimufua, MSU (*Photo provided by O. Aimufua*)

(Students, cont'd)

Alexander Newman, MSU (*Photo by Matt Kowalewski)*

Alexander Newman, an Engineering Physics major with MSU's Physics Department, is building a Polarization/ Analyzer Source for the optics lab. He is currently focusing on automating the system by developing the motor control electronics for two rotation stages and interfacing them to a microcontroller. Once complete, he will program a user interface to allow near-automated operation. Alexander's impression of NASA Goddard has been very favorable: "I really enjoy working at NASA. Since I started, I have gained a lot of knowledge when it comes to building a circuits board, soldering, etc. It is a very nice atmosphere to work in and [everyone]is friendly and very helpful. They are always willing to teach me new things, which helps broaden my mind."

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Events at Goddard

On Wednesday, January 15, the 5th Annual Goddard Film Festival was held in Goddard's Bldg. 3 Auditorium, with screenings at 10am and 11am. **Genna Duberstein** once again curated the festival that featured videos produced by Goddard Multimedia, with a high percentage of them by GESTAR members: **Tom Bridgman, Ryan Fitzgibbons, Dan Gallagher, Michael Lentz, Matt Radcliff, Cindy Starr, Silvia Stoyanova,** and **Scott Wiessinger**. After votes were tallied, "Raining Loops" (T. Bridgman and S. Wiessinger) was the overall winner. A compilation of the videos is online.

Two weeks later, on Wednesday, January 29, in Goddard's Bldg. 28, the annual Sciences and Exploration Directorate Poster Party was held. GESTAR scientists **Deborah Stein-Zweers, Lok Lamsal, Andy Sayer, Batuhan Osmanoglu, Mark Olsen,** and **Jerry Ziemke** were among the many Goddard scientists who authored or co-authored posters on display. Dalia Kirschbaum (NASA GSFC) gave a hyperwall presentation on the then upcoming GPM mission in the NCCS Data Exploration Theater, which is on the second floor of Bldg. 28.

Additionally, various booths were set up with handouts and information sheets for missions such as MMS and GPM. The poster party's "Science as Food" contest featured a Fermi cake as well as tethersondes created by Deborah Zweers.

Ryan Fitzgibbons manning the GPM Booth (*Photo by Amy Houghton, GESTAR/USRA*)

Recent Publications

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Maniac Talk

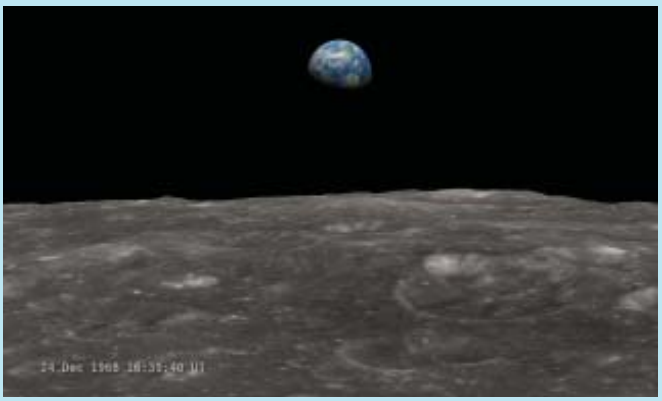
GESTAR thanks the following scientists who presented talks this past winter: William Lau, NASA Goddard (Jan) and Peter Hildebrand, NASA Goddard (Feb). If you missed either of these or other past talks, you can view them online at the Maniac Talk site: http://maniactalk.gestar.usra.edu/.

Please visit the site to see the rest of the 2014 lineup. Thanks again to **Charles Gatebe** and Bill Hyrbyk for their continued assistance with these well-attended events.

Celebrating *Earthrise*

On December 24, 1968, the crew of Apollo 8 became the first humans to witness the Earth rising over the Moon. Astronaut Bill Anders captured the moment in his iconic photograph, "Earthrise." Using terrain data from the Lunar Reconnaissance Orbiter and the astronauts' own audio and photographs, **Ernie Wright** created a 7-minute video titled "Earthrise: The 45th Anniversary" to commemorate Apollo 8's historic flight, recreating the moment when the crew first saw and photographed the Earth rising from behind the Moon. The visualization reveals significant new information about the Earthrise photographs. **Daniel Gallagher** is the editor of this video, which was reposted to TIME, The Weather Channel, and Gizmodo; to date, the visualization has received over a million views on NASA Explorer. The video's narration is written and performed by Andrew Chaikin, the author of A Man on the Moon, who appears courtesy of The Lunar and Planetary Institute (LPI).

To view the video, visit either NASA Explorer (YouTube) or the NASA Goddard SVS.



~Stay Tuned~

In May 2014, GESTAR will be holding an All-Hands Meeting and celebrating its 3rd anniversary.

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.