

JCET: QUARTERLY REPORT # 1

PERIOD COVERED: SEPTEMBER 30-DECEMBER 30, 2015, 2015



Dear GSFC Colleagues,

It gives us a great pleasure and satisfaction to be associated with JCET and UMBC as we embark on a journey of science discovery and collaborative work with NASA/GSFC in the next five years. This joint scientific discovery will build on JCET's proud 20yr track record of accomplishment. I have no doubt we will meet or exceed expectations – thanks to excellent JCET faculty and business office. We also want to thank the NASA/GSFC business office for all the help, advice, and patience they provided us in the processes of implementing this agreement.

This quarterly report inaugurates the first of a series of quarterly reports by JCET to be submitted to NASA/GSFC leadership as required by the new cooperative agreement.

We look forward to continue our constructive and successful partnership!

Belay B. Demoz and the JCET team.

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HIGHLIGHTS : *A SUMMARY OF JCET AND JCET FACULTY IN THE NEWS.*

- **Research Forum meeting planning:** JCET was well-represented at the UMBC Fall 2015 Research Forum, “Climate Change and the Environment,” held at the Albin O. Kuhn Library at UMBC on October 30, 2015. JCET Director, Belay Demoz, moderated the panel entitled “Measuring, Modelling and Understanding our Changing World.” JCET scientist Ruben Delgado and UMBC Professor Jeff Halverson, a former JCET scientist, presented in that panel. Posters were presented by JCET scientists and JCET graduate students. Mr. Robert Marshall, CEO of Earth Networks (home of the popular WeatherBug ® app), gave the Keynote Address, outlining the impressive array of sensors that Earth Networks has in place around the globe. Marshall expressed interest in a continued collaboration with UMBC on a number of environmental areas. An example was the long running UMBC Smog Blog and its association into WeatherBug!
- **Editor’s Choice in Science magazine:** A recent publication by Glenn Wolfe, Thomas Hanisco (614), Jason St Clair and coworkers was highlighted as an Editor's Choice article in the 30 October issue of Science Magazine. The study, "Quantifying sources and sinks of reactive gases in the lower atmosphere using airborne flux observations" (Geophys. Res. Lett., [10.1002/2015GL065839](https://doi.org/10.1002/2015GL065839) (2015)) uses observations from the 2013 NASA SEAC4RS mission to derive vertical fluxes for a suite of reactive gases, which provide the groundwork for developing a quantitative, comprehensive and self-consistent picture of atmospheric boundary layer processes. According to the highlight,
"(this) approach will improve our knowledge of biogenic and anthropogenic emissions, photochemical mechanisms, and deposition."
- **Antarctic glaciers still losing ice fast!: [November 30, 2015]:** A study published in 2012 showed average elevation losses of up to 82 feet (25 meters) per year for the lower Green and Hektor glaciers from 2006 to 2011. So IceBridge’s discovery that both are still losing ice fast many years after the loss of the adjacent ice shelf is “not all that surprising given what we have observed with other sensors,” said Christopher Shuman, a University of Maryland, Baltimore County glaciologist working at Goddard and co-author of the 2012 report.
- **Lorraine Remer Named Fellow of the AGU;** Dr. Lorraine Remer was honored as a newly-elected Fellow of the AGU, December 16.
- **Jay Herman,** senior research scientist at UMBC’s Joint Center for Earth Systems Technology (JCET) and the EPIC instrument lead investigator at NASA’s Goddard Space Flight Center, explains that ultraviolet and near-infrared wavelengths allow him to watch as dust from the Sahara Desert travels west across the Atlantic Ocean, for example. “It’s the only view we have like this where everything is at the exact same instant in time, even though the local times are different,” he says. Article link: <http://news.umbc.edu/new-nasa-camera-gives-scientists-an-epic-perspective-of-earth-umbc-researcher-explains/>

PROPOSALS: *LISTING OF PROPOSALS SUBMITTED AND GRANTS RECEIVED,*

Awarded

A joint proposal with Howard University, PI P. Misra, with JCET Co-Is Belay Demoz and Susan Hoban, was selected for funding in the MUREP program. The proposal is entitled “[NASA Early Opportunities](#)

[Program for Underrepresented Minorities in Earth and Space Sciences.](#)” Start date has not yet been announced.

Submitted

PI: Strow, Larrabee	NASA	An Homogenous Infrared Hyperspectral Radiance and Level 3 Climate Record Combining NASA AIRS, JPSS CrIS, and EUMETSAT IASI
PI: Herman, Jay	NASA	Radiometric Calibration of the DSCOVR-EPIC Satellite Spectrometer with Data from Multiple NASA and non-NASA Satellites
PI: Zhai, Pengwang	NGIA	An Innovative Atmospheric Correction Scheme Ocean Observations Using Combined Active and Passive Measurements
PI: Penwang Zhai	JPL	Validation of the Line-by-Line Radiative transfer Modeling Task
Co-I: Turpie, Kevin	NASA	Phenology Imaging Spectrometer for Coastal Ecology Studies (PISCES)
Co-I: Pavlis, Ericos	NASA	GRASP: Geodetic Reference Antenna in Space

MEETINGS AND FIELD WORK ATTENDED: *LISTING OF MEETINGS, TRAVEL,*

Dr. Ana Prados (UMBC/JCET) attended The NASA Applied Remote Sensing Training Program (ARSET) hosted the first meeting of Air Quality Working Group (AQWG) on November 10 at Goddard. The goal of the working group is to facilitate communication among NASA scientists, NASA data product and tool developers, and applied science professionals. The first meeting allowed NASA scientists and data providers to learn about ARSET’s air quality trainings and share information on existing and future NASA air quality products and tools for air quality applications; and established ways ARSET and AQGW members can work together.

Dr. Jae Lee was in the organizing committee for The 2015 Sun-Climate Symposium “Multi-Decadal Variability in Sun and Earth during the Space Era”, a joint venture with NASA and the Laboratory for Atmospheric and Space Physics/University of Colorado (LASP) was held in Savannah, Georgia, November 10-13, 2015. She also presented an oral talk “Solar Rotational Modulations of Spectral Irradiance and Correlations with the Variability of Total Solar Irradiance”

JCET faculty participation in Annual Meeting of the American Geophysical Union (AGU) [San Francisco, CA December 14-18, 2015]

EDUCATION AND OUTREACH: *LISTING OF OUTREACH, GRADUATE SEMINAR, COURSES TAUGHT AND ADVISEMENT PARTICIPATED AND GRADUATIONS.*

JCET Seminar

The JCET graduate research assistants participated in the weekly JCET Seminar. During the Fall semester, the students each make a 30-minute presentation on the current state of their research.

[Link to Fall Seminar Schedule](#)

Courses taught by JCET Faculty & Staff in Fall 2015:

PHYS 335: Physics and Chemistry of the Atmosphere, Dr. Forrest Hall

GES 311: Weather and Climate, Dr. Ali Tokay

GES 381: Remote Sensing, Drs. Lorraine Remer & Kevin Turpie

FYS 108: Mathematics in Literature, Ms. Catherine Kruchten

Recent graduations:

Adriana Rocha Lima was hooded by her PhD advisor, Dr. Vanderlie Martins (JCET Fellow) at UMBC Graduate Commencement on December 16, 2015. The title of Dr. Rocha Lima's dissertation is "Optical, microphysical, and compositional properties of volcanic ash, dust, and other atmospheric aerosols." Dr. Rocha Lima is now working as a JCET Post-doctoral associate in Code 614.

PUBLICATIONS : *LISTING OF REPORTS AND ARTICLES*

Clark Weaver (614), Jay Herman (614/UMBC/JCET), Gordon Labow (614), David Larko (614), and L.-K. Huang, 2015: Shortwave TOA Cloud Radiative Forcing Derived from a Long-Term (1980–Present) Record of Satellite UV Reflectivity and CERES Measurements. *J. Climate*, **28**, 9473–9488. doi: <http://dx.doi.org/10.1175/JCLI-D-14-00551.1>

Gail Skofronick-Jackson (612), David Hudak, Walter Petersen (MSFC), Stephen W. Nesbitt, V. Chandrasekar, Stephen Durden (JPL), Kirstin J. Gleicher, Gwo-Jong Huang, Paul Joe, Pavlos Kollias, Kimberly A. Reed, Mathew R. Schwaller (612), Ronald Stewart, Simone Tanelli (JPL), Ali Tokay (612/JCET), James R. Wang (612), and Mengistu Wolde, 2015: Global precipitation measurement cold season precipitation experiment (GCPEX): for measurement's sake, let it snow. *Bull. Amer. Meteor. Soc.*, 96, 1719–1741. doi: <http://dx.doi.org/10.1175/BAMS-D-13-00262.1>

Munchak, S. J. (612), R. Meneghini (612), M. Grecu (612/MSU), W. S. Olson (612/UMBC/JCET): "A Consistent Treatment of Microwave Emissivity and Radar Backscatter for Retrieval of Precipitation over Water Surfaces" has been accepted to the *Journal of Atmospheric and Oceanic Technology*.

Wolfe, G. M. (614/UMBC/JCET), Kaiser, J., Hanisco (614), T. F., Keutsch, F. N., de Gouw, J. A., Gilman, J. B., Graus, M., Hatch, C. D., Holloway, J., Horowitz, L. W., Lee, B. H., Lerner, B. M., Lopez-Hilfiker, F., Mao, J., Marvin, M. R., Peischl, J., Pollack, I. B., Roberts, J. M., Ryerson, T. B., Thornton, J. A., Veres, P. R., and Warneke, C.: Formaldehyde production from isoprene oxidation across NO_x regimes, *Atmospheric Chemistry and Physics Discussions*, 15, 31587–31620, doi: 10.5194/acpd-15-31587-2015, 2015.

Marais, E. A., Jacob, D. J., Jimenez, J. L., Campuzano-Jost, P., Day, D. A., Hu, W., Krechmer, J., Zhu, L., Kim, P. S., Miller, C. C., Fisher, J. A., Travis, K., Yu, K., Hanisco, T. F. (614), Wolfe, G. M. (614/UMBC/JCET), Arkinson, H. L., Pye, H. O. T., Froyd, K. D., Liao, J., and McNeill, V. F.: Aqueous-phase mechanism for secondary organic aerosol formation from isoprene: application to the Southeast United States and co-benefit of SO₂ emission controls, *Atmospheric Chemistry and Physics Discussions*, 15, 32005–32047, doi: 10.5194/acpd-15-32005-2015, 2015.

Samarasinha, N., Mueller, B. E. A., Knight, M. M., Farnham, T. L., Briol, J., Brosch, N., Caruso, J., Gao, X., Gomez, E., Lister, T., Hergenrother, C., Hoban, S., Prouty, R. (UMBC/JCET), Holloway, M., Howes, N., Guido, E., Hui, M., Jones, J. H., Penland, T. B., Thomas, S. R., Wyrosdick, J., Kiselev, N., Ivanova, A. V., Kaye, T. G., Kikwaya Eluo, J.-B., Lau, B. P.S., Lin, Z.-Y., Luis Martin, J., Moskvitin, A. S., Nicolini, M., Ottum, B. D., Pruzenski, C., Vogel, D.C., Kellett, L., Rapson, V., Schmid, J., Doyle, B., Dimino, F., Carlino, S., Safonova, M., Murthy, J., Sutaria, F., Schleicher, D. G., Snodgrass, C., Tezcan, C. T., & Yorukoglu, O., Trowbridge, D., Whitmer, D., and Ye, Q.-Z.

(2015). Results from the worldwide coma morphology campaign for comet ISON (C/2012 S1). *Planetary And Space Science*, doi:10.1016/j.pss.2015.10.006

UPCOMING EVENTS: *A “HEADS-UP” SECTION FOR UPCOMING EVENTS WHEN NEEDED.*

Spring 2016 JCET Seminar

The JCET graduate research assistants will be developing a proposal to NASA to study dust transport across the Atlantic. Each week, the students will give a presentation on one aspect of the proposal concept. The series begins with a guest lecture from JCET faculty member and AGU Fellow, Dr. Lorraine Remer. The seminar is held each Tuesday, 11 am – Noon, at UMBC in Physics 401. The public is welcome to attend.

[Link to Seminar Website](#)

PERSONNEL CHANGES:

LISTING OF PROMOTIONS:

None this quarter

HIRES:

Brock Blevins as a full-time exempt staff Research Analyst supporting Prados-started 12/23

Mustafa Aksoy as a Post-doctoral Research Associate working with Racette –started 1/11

Igor Veselovski as an Associate Research Scientist working with Whiteman – to start 1/19

Hua Song as a Post-doctoral Research Associate working with Zhang – to start 1/25

Stephen Nichols as a Post-doctoral Research Associate working with Mohr to start in March

FACULTY IN NEED OF FUNDING:

The following faculty/staff are working at a reduced FTE – some by choice but most because of the need for funding.

William Barnes* (On payroll at 40%; variable hours); Allen Chu (at 60%; 20% effective 1/25/16); Forrest Hall (at 50%); Susan Hoban (at 50%); Daniel Konig (at 70%); Catherine Kruchten (at 50%); Magda Kuzmicz-Cieslak (at 70%); William Olson (at 85%); Erricos Pavlis (at 90%); Chung-Lin Shie (at 75%); Christopher Shuman (at 60%; 26.5% effective 12/28/15; 5% effective 5/29/16); Leonid Yurganov (at 50%)

*reduced FTE by choice of the faculty member