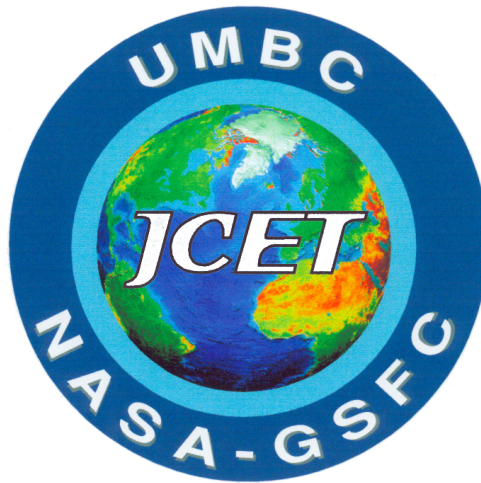


JCET COOPERATIVE AGREEMENT NNX15AT34A

YEAR 4 QUARTERLY REPORT # 1

PERIOD COVERED: OCTOBER 1 – DECEMBER 31, 2018



Dear GSFC Colleagues,

The current JCET cooperative agreement has completed the first quarter of its fourth year. This report describes the research of the JCET faculty, funding proposals that have been submitted during this quarter, as well as education and outreach efforts of the Center, changes in personnel and upcoming events.

We are delighted to report also on the ever-strengthening partnerships between JCET, Goddard and the UMBC academic departments that relate to JCET's mission.

With great pleasure, we submit this quarterly report highlighting our ongoing partnership with NASA Goddard Space Flight Center.

Sincerely,
Belay B. Demoz, JCET Director, and the JCET team.

HIGHLIGHTS: *A SUMMARY OF NEWSWORTHY JCET ACTIVITY.*

EVENTS & PRESENTATIONS AT GODDARD

Climate & Radiation Laboratory Seminars

JCET Faculty presented the following seminars for the Goddard Climate & Radiation Laboratory:

- Tamas Várnai (UMBC JCET), "Characterizing Ice Clouds using EPIC Observations of Sun Glint," October 10, 2018.
- Pengwang Zhai (UMBC JCET & Physics), "A Glamorous Marriage between Spectrometer and Polarimeter: A Theoretical Exploration on NASA's PACE Science," November 28, 2018.

Outreach to K-12 Students at Goddard

On November 1, 2018, Valerie Casasanto (UMBC JCET) held a school visit to NASA Goddard with 60 high school and middle school students and teachers from Charlottesville, Virginia. Participants received tours of Goddard's I&T facilities, a hyperwall talk, a tour of the climate computing facility, an augmented reality hands-on activities and GLOBE tree height measurements.

NASA Goddard Workshop on Artificial Intelligence

Tianle Yuan (UMBC JCET) attended the NASA Goddard Workshop on Artificial Intelligence, held November 27-29, 2018 and gave a talk entitled "Finding Ship Tracks in NASA MODIS data with a deep learning model."

IN THE NEWS

Dramatic changes in Antarctica

Christopher Shuman (UMBC JCET) was quoted in several articles that refer to the perfectly square-ended iceberg floating in Antarctica:

- https://www.washingtonpost.com/science/2018/10/24/theres-perfectly-rectangular-iceberg-floating-antarctica-heres-how-it-got-that-way/?noredirect=on&utm_term=.e67f3848c697
- <https://inews.co.uk/news/environment/rectangular-iceberg-perfect-how-came-exist/>
- <https://www.yorkshirepost.co.uk/read-this/perfect-rectangular-iceberg-floating-antarctic-nasa/>
- <https://earthobservatory.nasa.gov/images/144170/a-place-where-icebergs-go-to-die>
- <https://earthobservatory.nasa.gov/blogs/earthmatters/2018/11/05/famous-rectangular-icebergs-rough-journey/>

SCIENCE TEAM MEETINGS

NASA Sounder Science Team Meeting

Jae Lee (UMBC JCET) attended the NASA Sounder Science Team Meeting, held October 1-5, 2018, in Greenbelt, MD.

MODIS/VIIRS Science Team Meeting

JCET faculty participated in the 2018 MODIS/VIIRS Science Team Meeting, held October 15-19, 2018, in Silver Spring, MD and made the following presentations:

- Tamas Várnai (UMBC JCET), "Aerosol Properties in Partly Cloudy Regions"
- Ivy Tan (UMBC JCET), "Extratropical Cloud Optical Depth Feedback"
- Kevin Turpie (UMBC JCET), "The airborne LUNar Spectral Irradiance (air-LUSI) Mission"

17th AeroCom/6th AeroSat Workshops

JCET faculty participated in the 17th AeroCom /6th AeroSat workshops, which took place on October 15-19, 2018 in College Park, MD. Lorraine Remer (UMBC JCET) was one of the local hosts. JCET faculty made the following presentations:

- Lorraine Remer (UMBC JCET) "The PACE Mission: Focus on Aerosols and Clouds"
- Tianle Yuan (UMBC JCET) "Hawaiian volcano impact on aerosols, clouds and energy budget"
- Vanderlei Martins (UMBC JCET & Physics) "Using small satellite constellations for Aerosol Cloud Interactions (ACI)"

ATom Science Team Meeting

JCET faculty attended the Atmospheric Tomography Mission (ATom) 2018 Science Team Meeting that took place in Boulder, CO November 13-15, 2018 and gave the following presentations:

- Glenn Wolfe (UMBC JCET), "Mapping OH Throughout the Remote Troposphere"
- Huisheng Bian (UMBC JCET), "Observationally constrained analysis of sea salt aerosol in the marine atmosphere"

EXTERNAL PRESENTATIONS/WEBINARS

ARSET Training

The NASA Applied Remote Sensing Training (ARSET) program conducted a four-session webinar series entitled, "High Temporal Resolution Air Quality Observations from Space." This training was attended by 544 participants representing ~400 organizations from 73 countries. This course was supported by Brock Blevins (UMBC JCET) and Selwyn Hudson Odoi (UMBC JCET), and the ARSET program is managed by Ana Prados (UMBC JCET).

Ocean Optics XXIV

Kevin Turpie (UMBC JCET) hosted a Town Hall at Ocean Optics XXIV meeting in Dubrovnik, Croatia titled "The Future of Imaging Spectroscopy over Coastal, and Inland Waters," which included a discussion of the recently initiated Surface Biology and Geology (SBG) mission. He also presented posters titled "The Hyperspectral Infrared Imager (HyspIRI) and the Surface Biology and Geology (SBG) Mission Concepts" and "The airborne LUNar Spectral Irradiance (air-LUSI) Mission."

Science Writer's Conference

Valerie Casasanto (UMBC JCET) was part of a panel on science writing in Augmented Reality and Virtual Reality at the Science Writers 2018 Conference, on October 12, 2018, in Washington, DC. She presented and demonstrated ICESat-2's Augmented Reality Module on the HoloGLOBE App.

American Water Resources Annual Conference

Kevin Turpie (616/UMBC) gave a talk on November 8, 2018, at the American Water Resources Annual Conference in Baltimore titled "NASA Designated Global Observations and Remote Sensing of Coastal and Inland Aquatic Environments" in a session called "Applying Earth Observations for Resource Management Around Chesapeake Bay Water Quality."

GLOBE and IceSat-2 Webinar

Valerie Casasanto (UMBC JCET) participated in and presented at a special NASA GLOBE Partnership webinar on November 15, 2018, sponsored by the NASA Goddard Office of Education. This webinar highlighted the ICESat-2 Mission, the Trees Around the GLOBE Student Research Campaign, and the Elementary GLOBE Reader. During the webinar, Valerie discussed the ICESat-2 mission and demonstrated some hands-on activities and discussed how participants could become involved with the Trees Around the GLOBE Student Research Campaign. During the webinar, there were 42 live participants from five countries including Croatia, Poland, Estonia, Argentina, and the United States (including Puerto Rico). Webinar can be viewed at: <http://www.ustream.tv/recorded/118282034>

NOAA STAR Seminar

Kevin Turpie (UMBC JCET) hosted a NOAA STAR Seminar in College Park, MD, on November 30, 2018, entitled "air-LUSI: How we flew a Lab Instrument on an Airplane at 70,000 Feet."

NEW TASKS:

Task 176

Sponsor: Weijia Kuang

JCET Personnel: TBD

This task supports the development and use for scientific research of numerical software for estimating the tidal response of fluids. This includes the theoretical and algorithmic development, coding, testing, validation, documentation, and example applications, as well as usage to tackle scientific problems of interest. The numerical models developed include the fluid tidal response as well as the electromagnetic tidal response. The research results will be used with both the Earth and other planetary bodies.

Task 177

Sponsor: Lazaros Oraopoulos

JCET Personnel: Ivy Tan

Dr. Tan will examine how to implement the concept of Cloud Regimes, and specifically my group's MODIS CRs to examine the optical depth feedback of mid-latitude clouds and especially the role of decoupling in the boundary layer. The work for this task will link with elements of her own selected TASNPP proposal. She will compare observational and modeling (from Global Climate Models) results potentially using cloud radiative kernels. Expected deliverables are findings that may be included in presentations and peer-reviewed publications.

Task 178**Sponsor: Betsy Middleton****JCET Personnel: Petya Campbell**

SCERIN: These activities involve the coordination and support for the South Central and Eastern European Network (SCERIN, <http://www.fao.org/gtos/gofc-gold/networks.html>). Supported activities include: i) coordinating, facilitating and organizing the activities and collaborative work of SCERIN; ii) conducting and participating in international workshops and meetings; and iii) contributing/facilitating SCERIN Training and Capacity Building initiatives to facilitate the development and use of interoperable remote sensing methods, technologies and products in the region. Activities include the comparison/evaluation/advancement of measurement and analysis techniques from ground-based, aircraft, and satellite-borne instruments for a variety of ecosystem types and conditions, writing and presenting results at scientific and professional meetings and support of LCLUC and GOFC-GOLD program activities. Surface Biology and Geology (SBG): The SBG activities support the Designated Observable mission defined in the 2017 Decadal Survey for imaging spectroscopy and multispectral imaging thermal measurements, with GSFC as a partner Center with the lead Center, JPL. This task provides support to participate in the Research and Application Working Groups, the Architectural Design activities, and the Workshop planning and support activities. Activities also include the advancement of measurement and analysis techniques from ground-based, aircraft, and satellite-borne instruments for a variety of ecosystem types and conditions; modeling of ecosystem function and radiative transfer; writing and presenting results; and support of SBG programmatic activities. This task also supports the collection and analysis of field measurements for calibration/validation, aimed at the development and testing of algorithms applicable to SBG and other NASA-supported missions. A focus will be given to activities related to plant functional types and physiology, and supports research to justify missions currently under development.

PROPOSALS: LISTING OF PROPOSALS AWARDED AND SUBMITTED**AWARDED**

Agency	UMBC Role	Name	Solicitation/Sponsor	Title
NOAA	PI	Lorraine Remer	1333MD18QNEED0072	Conduct calibration & validation of SNPP and NOAA-20 VIRS aerosol products
SSAI	Co-I	Ruben Delgado	EPA	Mixing Layer Height Algorithm for Environmental Protection Agency Photochemical Assessment Monitoring Site

SUBMITTED

Agency	UMBC Role	Name	Solicitation/Sponsor	Title
NOAA	PI	Glenn Wolfe	NOAA-OAR-CPO-2019-2005530 Long term trends in observations of atmospheric composition	Mapping the Global Variability of Tropospheric Oxidizing Capacity

NASA	PI	Petya Campbell	17-LCLUC17-0013	Prototyping MuSLI canopy chlorophyll content for assessment of vegetation function and productivity
Smithsonian Astrophysical Observatory	PI	Jay Herman	Smithsonian Astrophysical Observatory	Tropospheric Emissions, Monitoring of Pollution (TEMPO)

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

OCTOBER

Traveler	Destination	Travel Begin	Travel End	Trip Purpose
Hepplewhite, Christopher	La Grange, Illinois to Baltimore, MD	9/30/18	10/5/18	AIRS Science Team Meeting.
Delgado, Ruben	MD to El Paso, TX	10/1/18	10/4/18	NOAA CREST Recruiting @ University of Texas, El Paso
Turpie, Kevin	MD to Dubrovnik, Croatia	10/7/18	10/12/18	Present at 2018 Ocean Optics Meeting.
Abuhassan, Nader	MD to Innsbruck, Austria	10/7/18	10/13/18	Review/Evaluate new software/hardware upgrades of Pandora spectrometer system.
Olson, William	MD to Phoenix, AZ	10/7/18	10/13/18	Present PI Meeting, attend JPST and Algorithm Team Meeting.
Shie, Chung-lin	MD to Phoenix, AZ	10/7/18	10/17/18	Attend/Present at NASA PMM Science Team Meeting.
Turpie, Kevin	MD to Dubrovnik, Croatia	10/7/18	10/12/18	Present at 2018 Ocean Optics Meeting.
Demoz, Belay	MD to Boulder, CO	10/8/18	10/12/18	UCAR Membership Meeting representing UMBC/ATPH.
Tokay, Ali	MD to Scottsdale, AZ	10/8/18	10/12/18	Attend/Present at NASA PMM Science Team Meeting.
Nicholls, Stephen	MD to Phoenix, AZ	10/8/18	10/14/18	Attend/Present at NASA PMM Science Team Meeting.
Prados, Ana	Springfield, VA to Huntsville, AL	10/10/18	10/12/18	Attend the NASA Capacity Building Program Retreat at NASA Marshall Space Flight Center.
Cieslak, Jan	MD to Logan, UT	10/12/18	10/19/18	Research support for HARP CubeSat Satellite.
Cieslak, Jan	MD to Salt Lake City,	10/23/18	10/27/18	Research support for HARP CubeSat Satellite.

	UT			
Abuhassan, Nader	MD to Alexandria/Egypt	10/20/18	10/30/18	Participate in the International Conference of African Assoc. of Remote Sensing & the Environment.
Yuan, Tianle	MD to Princeton, NJ	10/28/18	10/31/18	Attend the "Understanding and Modeling the Earth's Climate Symposium" in honor of Isaac Held.

NOVEMBER

Traveler	Destination	Travel Begin	Travel End	Trip Purpose
Prados, Ana	Springfield, VA to Cleveland, OH	10/30/18	11/4/18	Present ARSET paper on science program evaluation and lead session at Evaluation 2018.
Pavlis, Erricos	MD to Canberra, Australia	10/31/18	11/9/18	Attend the 21st International Workshop on Laser Ranging and several splinter meetings.
Abuhassan, Nader	MD to Toronto, CAN	11/1/18	11/4/18	Meeting in support of Pandora deployment activities.
Tokay, Ali	MD to Wallops, VA	11/6/18	11/8/18	Attend Precipitation Imaging Package (PIP) training at NASA Flight Facility.
Yang, Zhifeng	MD to Boulder, CO	11/6/18	11/13/18	Present at 9th International Workshop on Air Quality Forecasting Research (IWAQFR) and research meeting.
Mehta, Amita	MD to Dehradun, India	11/7/18	11/26/18	To conduct NASA ARSET - ISRO joint training and present at Drought Monitoring Workshop.
Delgado, Ruben	MD to NY, NY	11/12/18	11/13/18	Recruitment presentation at City College of New York.
Wolfé, Glenn	MD to Boulder, CO	11/12/18	11/15/18	Attend ATom Science Team Meeting.
Bian, Huisheng	MD to Boulder, CO	11/12/18	11/16/18	Attend ATom Science Team Meeting.
Lee, Jae	MD to Toulouse, FR	11/12/18	11/17/18	Attend/present at the EEI (Earth Energy Imbalance) Meeting.
Shalaby, Lena	MD to San Juan, PR	11/14/18	11/18/18	Participate in 2nd half of SAMLAC school hosted by UPR and install instrument.
Tokay, Ali	MD to Wallops, VA	11/15/18	11/16/18	Host a site visit.
Abuhassan, Nader	MD to Mexico City, MEX	11/17/18	11/21/18	Deployments of the Pandora spectrometer.
Tokay, Ali	MD to Seogwipo, South Korea	11/25/18	12/1/18	Attend ICE-POP field campaign workshop. (Ground transportation only as trip partially covered by Korean Meteorological Agency.)

DECEMBER

Traveler	Destination	Travel Begin	Travel End	Trip Purpose
Barbosa, Henrique (JV Martins)	Sao Paulo, Brazil to UMBC	12/2/18	12/8/18	Visitor to collaborate in analysis of data from AirHarp collected during ACEPOL campaign.
Cieslak, Jan	MD to Logan, UT	12/3/18	12/7/18	Research support for HARP CubeSat Satellite.
Delgado, Ruben	MD to Charlottesville, VA	12/4/18	12/6/18	Presenting at MARAMA Monitoring Committee Workshop.
Abuhassan, Nader	MD to Huntsville, AL	12/5/18	12/7/18	Setup of Pandora Spectrometer System.
Huemmrich, Karl F.	Local-Washington, DC	12/6/18	12/7/18	Attend the National Academies Workshop on Arctic Greening.
Pavlis, Erricos	Local-Washington, DC	12/8/18	12/13/18	AGU 2018 & IERS Directing Brd & Splinter Meetings.
Campbell, Petya	Local-Washington, DC	12/9/18	12/14/18	AGU 2018 Meeting.
Huemmrich, Karl F.	Local-Washington, DC	12/9/18	12/14/18	AGU 2018 Meeting & Commercial Satellite Data Workshop.
Lee, Jae	Local-Washington, DC	12/9/18	12/14/18	AGU 2018 Meeting.
Mukherjee, Lipi	Local-Washington, DC	12/9/18	12/14/18	AGU 2018 Meeting.
Remer, Lorraine	Local-Washington, DC	12/9/18	12/14/18	AGU 2018 Meeting.
Yuan, Tianle	Local-Washington, DC	12/9/18	12/14/18	AGU 2018 Meeting.
Abuhassan, Nader	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Bian, Huisheng	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Caicedo, Vanessa	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Carroll, Brian	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Delgado, Ruben	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Demoz, Belay	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Hannun, Reem	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Herman, Jay	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Kuzmicz-Cieslak, Magdalena	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Martins, J. Vanderlei	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
McBride, Brent	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Prados, Ana	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.

Puthukkudy, Anin	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Robinson, Joseph	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Rocha Lima, Adriana	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Shie, Chung-lin	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
St. Clair, Jason	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Varnai, Tamas	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Wolfe, Glenn	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Xu, Xiaoguang	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Yang, Zhifeng	Local-Washington, DC	12/10/18	12/14/18	AGU 2018 Meeting.
Evans, Keith	Local-Washington, DC	12/11/18	12/13/18	AGU 2018 Meeting.
Guimond, Steve	Local-Washington, DC	12/11/18	12/14/18	AGU 2018 Meeting.
Tokay, Ali	Local-Washington, DC	12/13/18	12/13/18	AGU 2018 Meeting.
Shalaby, Lena	Local-Washington, DC	12/14/18	12/14/18	AGU 2018 Meeting.

EDUCATION AND OUTREACH: *LISTING OF OUTREACH, GRADUATE SEMINAR, COURSES TAUGHT AND ADVISEMENT, AND STUDENT ACCOMPLISHMENTS.*

Recent Departmental Affiliations: No new affiliations this quarter.

Courses taught by JCET Faculty & Staff in Fall 2018:

GES 301: Arctic Geography (3 credits), **F. Huemrich**

GES 311: Weather & Climate (3 credits), **A. Mehta**

PHYS 650: Atmospheric Chemistry (3 credits), **R. Hannun, J. St. Claire & G. Wolfe**

JCET Seminar:

The 2018-19 cohort of ten JCET graduate students, plus a number of first year graduate students in Physics and Geography & Environmental Systems participated in the JCET Seminar in Fall 2018. In fall semesters, the JCET Seminar comprise research presentations by the students, providing them an opportunity to practice and improve upon presenting their own research. This fall, we also had guest speakers: Jess Herpel, Natural Resources Planner and Luke Wisniewski, Chief of Climate Change, both from the Maryland Department of the Environment, and Christopher Shuman and Steven Guimond, from JCET. The JCET Seminar has become an important component in the professional development of these young scientists. The seminar series is open to the public and is coordinated by Dr. Susan Hoban, Associate Director of JCET.

Link to [Seminar schedule](#)

Link to [Seminar Website](#)

JCET Student Activities:

JCET Minority University Outreach

The Howard University students participating in the NASA MUREP MOO project participated in the "Measurement Bootcamp," a one-day workshop held at UMBC on October 6, 2018, and supported by JCET graduate and undergraduate students.

REPORTED PUBLICATIONS : LISTING OF REPORTS AND ARTICLES

- Ciufolini, I., Matzner, R. A., Feng, J. C., Paolozzi, A., Rubincam, D. P., **Pavlis, E. C.**, Ries, J. C., Sindoni, G., Paris, C. (2018). A new laser-ranged satellite for General Relativity and space geodesy: IV. Thermal drag and the LARES 2 space experiment. *The European Physical Journal Plus*, 133(8), 333.
- Ciufolini, I., **Pavlis, E. C.**, Ries, J., Matzner, R., Koenig, R., Paolozzi, A., Sindoni, G., Gurzadyan, V., Penrose, R., Paris, C. (2018). Reply to "A comment on "A test of general relativity using the LARES and LAGEOS satellites and a GRACE Earth gravity model, by I. Ciufolini et al."". *The European Physical Journal C*, 78(11), 880. <https://doi.org/10.1140/epjc/s10052-018-6303-1>
- De Souza-Machado, S. G., Strow, L. L., Tangborn, A. V.**, Huang, X., Chen, X., Liu, X., Wu, W., Yang, Q. (2018). Single-footprint retrievals for AIRS using a fast TwoSlab cloud-representation model and the SARTA all-sky infrared radiative transfer algorithm. *Atmos Meas Tech*, 11(1), 529-550.
- Fibiger, D. L., McDuffie, E. E., Dubé, W. P., Aikin, K. C., Lopez-Hilfiker, F. D., Lee, B. H., Green, J. R., Fiddler, M. N., Holloway, J. S., Ebben, C., Sparks, T. L., Wooldridge, P., Weinheimer, A. J., Montzka, D. D., Apel, E. C., Hornbrook, R. S., Hills, A. J., Blake, N. J., DiGangi, J. P., **Wolfe, G. M.**, Bililign, S., Cohen, R. C., Thornton, J. A., Brown, S. S. (2018). Wintertime Overnight NO_x Removal in a Southeastern United States Coal-fired Power Plant Plume: A Model for Understanding Winter NO_x Processing and its Implications. *Journal of Geophysical Research: Atmospheres*, 123(2), 1412-1425. <http://dx.doi.org/10.1002/2017JD027768>
- Kaiser, J., Jacob, D. J., Zhu, L., Travis, K. R., Fisher, J. A., Abad, G. G., Zhang, L., Zhang, X., Fried, A., Crouse, J. D., **St. Clair, J. M.**, Wisthaler, A. (2018). High-resolution inversion of OMI formaldehyde columns to quantify isoprene emission on ecosystem-relevant scales: application to the southeast US. *ATMOSPHERIC CHEMISTRY AND PHYSICS*, 18(8), 5483-5497. doi.org/10.5194/acp-18-5483-2018
- Kehm, A., Blossfeld, Mathis, **Pavlis, E. C.**, Seitz, F. (2018). Future global SLR network evolution and its impact on the terrestrial reference frame. *Journal of Geodesy*, 92(6), 625--635.
- Li, J., Mao, J., Fiore, A. M., Cohen, R. C., Crouse, J. D., Teng, A. P., Wennberg, P. O., Lee, B. H., Lopez-Hilfiker, F. D., Thornton, J. A., Peischl, J., Pollack, I. B., Ryerson, T. B., Veres, P., Roberts, J. M., Neuman, J. A., Nowak, J. B., **Wolfe, G. M.**, Hanisco, T. F., Fried, A., Singh, H. B., Dibb, J., Paulot, F., Horowitz, L. W. (2018). Decadal changes in summertime reactive oxidized nitrogen and surface ozone over the Southeast United States. *Atmos. Chem. Phys.*, 18(3), 2341-2361. <https://www.atmos-chem-phys.net/18/2341/2018/>
- Mao, J., Carlton, A., Cohen, R. C., Brune, W. H., Brown, S. S., **Wolfe, G. M.**, Jimenez, J. L., Pye, H. O. T., Lee Ng, N., Xu, L., McNeill, V. F., Tsigaridis, K., McDonald, B. C., Warneke, C., Guenther, A., Alvarado, M. J., de Gouw, J., Mickley, L. J., Leibensperger, E. M., Mathur, R., Nolte, C. G., Portmann, R. W., Unger, N., Tosca, M., Horowitz, L. W. (2018). Southeast Atmosphere Studies: learning from model-observation syntheses. *Atmos. Chem. Phys.*, 18(4), 2615-2651. <https://www.atmos-chem-phys.net/18/2615/2018/>
- McDonald, B. C., McKeen, S. A., Cui, Y. Y., Ahmadov, R., Kim, S.-W., Frost, G. J., Pollack, I. B., Peischl, J., Ryerson, T. B., Holloway, J. S., Graus, M., Warneke, C., Gilman, J. B., de Gouw, J. A., Kaiser, J., Keutsch, F. N., Hanisco, T. F., **Wolfe, G. M.**, Trainer, M. (2018). Modeling Ozone in the Eastern U.S. using a Fuel-Based Mobile Source Emissions Inventory. *Environmental Science & Technology*. <https://doi.org/10.1021/acs.est.8b00778>
- Otsubo, T., **Müller**, Horst, **Pavlis, E. C.**, Torrence, M. H., Thaller, D., Glotov, V. D., Wang, X., Sosnica, Krzysztof, Meyer, U., Wilkinson, M. J. (2018). Rapid response quality control service for the laser ranging tracking network. *Journal of Geodesy/Springer-Verlag GmbH*, 1--10. link.springer.com/article/10.1007/s00190-018-1197-0
- Varnai, T.**, Marshak, A. (2018). Satellite observations of cloud-related variations in aerosol properties. *Atmosphere*, 9, [doi: 10.3390/atmos9110430](https://doi.org/10.3390/atmos9110430).
- Veselovskii, I.**, Goloub, P., Podvin, T., Tanre, D., da Silva, A., Colarco, P., Castellanos, P., Korenskiy, M. (2018). Characterization of smoke/dust episode over West Africa: comparison of MERRA-2 modeling with multiwavelength Mie-Raman lidar observations. *Atmospheric measurements technique*, 11, 949-969.
- Vratolis, S., Eleftheriadis, K., Bougiatioti, A., Diapouli, E., **Veselovskii, I.**, Papayiannis, A. (2018). A new method for the retrieval of the equivalent refractive index of atmospheric aerosols. *Journal of Aerosol Science*, 117, 54-62.

- Whiteman, D., Perez-Ramirez, D., **Veselovskii, I.**, Colarco, P., Buchard, V. (2018). Simulations of spaceborne multiwavelength lidar measurements and retrievals of aerosol microphysics. *Journal of Quantitative Spectroscopy & Radiative Transfer*, 205, 27-39.
- Wolfe, G. M.**, Kawa, S. R., Hanisco, T. F., **Hannun, R. A.**, Newman, P. A., Swanson, A., Bailey, S., Barrick, J., Thornhill, K. L., Diskin, G., DiGangi, J., Nowak, J. B., Sorenson, C., Bland, G., Yungel, J. K., Swenson, C. A. (2018). The NASA Carbon Airborne Flux Experiment (CARAFE): instrumentation and methodology. *Atmospheric Measurement Techniques*, 11(3), 1757-1776.
- Wolfe, G. M.**, Kawa, S. R., Hanisco, T. F., Hannun, R. A., Newman, P. A., Swanson, A., Bailey, S., Barrick, J., Thornhill, K. L., Diskin, G., DiGangi, J., Nowak, J. B., Sorenson, C., Bland, G., Yungel, J. K., Swenson, C. A. (2018). The NASA Carbon Airborne Flux Experiment (CARAFE): instrumentation and methodology. *Atmospheric Measurement Techniques*, 11(3), 1757-1776.
- Wu, D. L., Wang, T., **Varnai, T.**, Limbacher, L. A., Kahn, R. A., Taha, G., **Lee, J. N.**, Gong, J., **Yuan, T.** (2018). MISR radiance anomalies induced by stratospheric volcanic aerosols. *Remote Sensing*, 10, 1875.

PERSONNEL:

LISTING OF PROMOTIONS:

Tianle Yuan was promoted to Associate Research Scientist.

HIRES:

Ivy Tan
Arowa Suliman

DEPARTURES:

Brock Blevins
Huang Song

FACULTY IN NEED OF FUNDING:

Keith Evans – Working at 60%
Susan Hoban – working at 90%
Bill Olson - working at 85%
Chung-Lin Shie – working at 75%
Christopher Shuman – working at 55%
Andrew Tangborn – working at 60%