

JCET NEWS

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Monitoring Vegetation Health and Cycles: UAV's Bridge Gap

Trees and plants not only sustain our lives with food and oxygen, they also cool our landscape, prevent soil erosion, and absorb our excess carbon, counteracting the effects of global warming. That's why it is important to monitor their health.

Vegetation goes through many cycles – both daily and seasonal. Plants and trees can look different at different times of the day and many processes can be missed. Important photosynthetic parameters vary considerably over the course of a day according to light, temperature, humidity and other factors. Despite satellite and



Dr. Petya Campbell (right) takes ground measurements with Dr. Betsy Middleton (GSFC, Code 618).

ground data (from towers and trucks), all of the ebbs and flows of vegetation cannot be monitored by these approaches alone. Satellites are capable of making a limited number of measurements per day/season.

Ground-based approaches yield measurements that are generally fixed, and do not allow dynamic characterization across space such as is possible from a small Unmanned Aerial Vehicles (UAV) equipped with Hyperspectral Systems. A UAV can fly at different times of the day to fill in the missing data gaps.

A new NASA project awarded in June 2015 under the Advanced Information Systems Technology Program "Next Generation Unmanned Aerial Vehicle (UAV)



Based Spectral Systems for Environmental Monitoring" is underway. Led by PI Petya Campbell, the project is a collaboration between dedicated researchers from NASA/GSFC, the University of Wisconsin, Madison, UMD and UMBC.





Team members take measurements of vegetation and solar radiance at GSFC, to characterize vegetation and develop automated routines for future UAV collection.

To kick-off the program, a mini-workshop was held January 11-15 at NASA Goddard. A team of 15 worked together to pilot test data collection in GSFC's Code 581 lab and outdoors on the rooftop of Building 33.

The team is now processing the collected data, writing software to optimize the protocols, and analyzing the results from their week at Goddard. Once flight approvals are obtained, the team will begin test flights in the centrifuge facility at GSFC in Spring. In the summer and fall, field campaigns will be run at research sites in Wisconsin and Maryland.

Danita Eichenlaub retiring

After 16 years of service to JCET, and sister centers, GEST and GPHI, JCET's Administrative Director will be leaving us at the end of March.

Danita has led JCET through the years in many capacities: as an Assistant Director, Associate Director, Acting Director, and Administrative Director. Through it all, she has led us to be the best and most efficient grant administration group at UMBC and NASA/GSFC. JCET and UMBC has benefited tremendously from Danita's advice and hard work and her leadership will be missed. JCET's Director, Belay Demoz puts it best. "I have been very lucky to work

closely with Danita and got to know and appreciate the dedication and commitment she puts into her work and JCET. Above all, her unwavering drive to advocate the status of research faculty within the UMBC administration. It is hard to imagine JCET without Danita. But, fortunately, she is leaving JCET in the good hands of Mary, Margo, Kevin and Cathy."

On behalf of all of JCET, we wish Danita all the best in her retirement!

We will honor Danita for her contributions in a farewell reception. The date and location will be announced.

Congratulations!

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 (Minority University Research and Education Project) "NASA Early Opportunities Program for Underrepresented Minorities in Earth and Space Sciences."

JCET/NASA paper Editor's Choice in 'Science'

A recent publication by Glenn Wolfe, Thomas Hanisco (GSFC Code 614) and Jason St. Clair 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 (2015)).

JCET GRA Seminars

This year's Graduate Research Assistant (GRA) seminars have begun and will run until April 26. This year the series takes a different approach. Students are developing a NASA science proposal to study dust transport over the Atlantic. The series kicked off with the excellent presentations by Drs. Lorraine Remer and Jasper Lewis. The next seminar will be held on February 16th at 11am at UMBC in the Physics Building, Room 401. Visit http://tinyurl.com/jop3a4x for the full schedule. All are invited to attend and encouraged to interact with students.

Previous years' presentations and excellent reading lists are available here: <u>Sites.google.com/a/umbc.edu/jcet-gra-seminars/home</u>.

JCET Welcomes New Faculty...

- Dr. Hua Song is working with Zhibo Zhang as a post-doc research associate based at UMBC in the Physics Department.
- Dr. Mustafa Aksoy is working with Dr. Paul Racette as a post-doc research associate at Goddard in the Microwave Instrument Technology Branch.
- Mr. Brock Blevins is now full-time as a research analyst with Dr. Ana Prados.
- Dr. Igor Veselovskiy has joined JCET again as an associate research scientist working with Dr. David Whiteman.
- Stephen Nicholls will join JCET on March 1st as a post-doc research associate working at Goddard with Karen Mohr. Stephen was a former summer intern at Goddard with the GSSP Program in 2011.

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