



# JCET NEWS

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## Operation IceBridge Completes Successful Mission

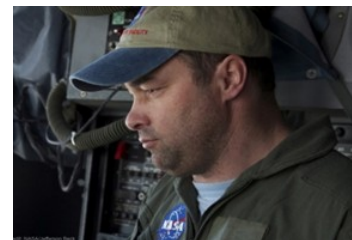
Michael Studinger, IceBridge's Project Scientist and JCET's Associate Research Scientist, has recently returned from a record breaking flight campaign to measure sea ice over the Arctic Ocean and glaciers in Greenland after spending 11 weeks there and leading 44 science flights. Flying over Greenland with the NASA P-3 aircraft, Michael and his team are studying many phenomena, one of which is "ice flux" – the movement of land ice into the ocean—along the margin of the Greenland Ice Sheet. One of the applications of this research is improved forecasting of sea ice melting using computer modeling.

For the first time, they were able to measure sea ice over the Chukchi and Beaufort Seas during this 2012 IceBridge Campaign.



Icy water in the fjord of the Kangerdlugssuaq Glacier in Eastern Greenland, as seen from NASA's P-3B aircraft, April 2012.

The best part of the mission in Michael's view is the new sea



Michael Studinger in the P-3 Aircraft during IceBridge 2012.

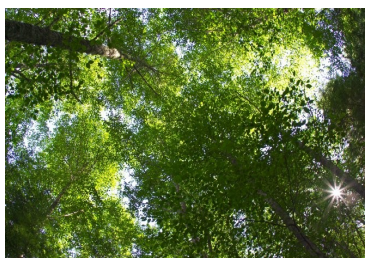
ice thickness product that the team has produced for the first time and that was available from the National Snow and Ice Data Center (NSDIC) before the team even returned home.

For more information visit [www.nasa.gov/icebridge/](http://www.nasa.gov/icebridge/)

## A "Fly's Eye" View of the World

Half or more of the carbon dioxide humans emit from industrial and transportation uses is taken up each year by the world's forests as they sock away carbon dioxide through photosynthesis. A vital question is, can the world's forests continue to provide this important service as the climate warms? If not, the Earth's climate could warm even faster than it is now. To answer this question it is necessary to measure the rate at which forests consume carbon, and how that varies over time and with geography. To date, there

has been no way to measure these rates globally.



Dr. Forrest Hall and Dr. Thomas Hilker of JCET have been able for the first time to accurately quantify forest photosynthetic rates from space

by analyzing subtle changes in the amount of light reflected from vegetation. They used a European satellite, CHRIS/PROBA, to measure the difference in the way trees reflect visible sunlight from their shaded and sunlit leaves. CHRIS/PROBA is unique in that the spacecraft rotates as it passes over a forest to provide, in Dr. Hall's words, "a fly's eye" view of trees measuring both their sunlit exposed and shaded leaves.

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It is this unique pointing capability that permits individual differences in the reflectance of sunlit and shaded leaves to be measured in order to obtain the overall photosynthetic rates of entire forests. Using CHRIS/PROBA measurements and their new analysis technique, they have quantified photosynthesis in forests around the world and have verified the accuracy by comparing their space measurements to those on the ground.

This new capability is important because it allows space-borne spectrometers for the first time to accurately quantify the rate at which forests remove carbon dioxide from the atmosphere, thought to be the dominant cause of global warming.

Unfortunately, CHRIS/PROBA launched in 1991, recently failed. As a follow-on, Dr's. Hall and Hilker together with Dr. Compton

Tucker of NASA GSFC, and an engineering team at GSFC are working on a new light-weight space instrument that uses prisms to achieve a "fly's eye" view of the forest at regional scales without the need to rotate the spacecraft itself. This will permit the measuring of global photosynthetic rates and carbon dioxide uptake every few days.

## News

### • J CET Earth Science Explorers

Two UMBC undergraduate students were selected to participate in the 2012 J CET Summer Program: Frank Harris with Dr. Ali Tokay, and Stephen Reckard with Drs. Fred Huemrich and Petya Campbell.

### • Beautiful Earth Day Event

A recent Beautiful Earth multi-media education program was held on April 17th and led by J CET's Valerie Casasanto and Principal Investigator for Beautiful Earth (combination of

music, art, and science). The program was broadcast live on NASA's Digital Learning Network (DLN) and can now be viewed and downloaded here: <http://beautifulearth.gsfc.nasa.gov>



Valerie Casasanto with students on Earth Day, NASA GSFC.

### • Girl Scouts Build Lunar Rovers

On May 12th, J CET's Laurie Cook and GSFC's Danielle Margiotta led an educational event for 29 Girl Scouts. The Girl Scouts met with 9 women engineers who spoke about their work.

The girls performed an engineering design challenge and built their own lunar rovers which were then tested (e.g., vibration, temp., EMI and simulated acoustics testing).

**Congratulations to Dr. Prados on her Applied Remote Sensing Training Program passing the external review with flying colors!**

**Congratulations to Dr. Larrabee Strow for winning the 3-Year NASA Award entitled "Hyperspectral Infrared Earth Radiance Time Series."**

**Congratulations to former J CET summer intern, Mr. Jaime Compton, who graduated from UMBC in May with a Master's Degree in Physics.**

## New Arrivals

J CET welcomes new faculty members:

**Dr. Hyoun-Myoung Cho**, Post-Doctoral Research Associate, located at UMBC, is working with Dr. Zhibo Zhang on the development of an infrared cloud property retrieval algorithm.

**Dr. Jae Lee**, Assistant Research Scientist, is working with Dr. Robert Cahalan at GSFC on TSIS (Total Solar

Irradiance Sensor) due for launch on the Joint Polar Satellite System (JPSS) Free Flyer in 2016. She is also working

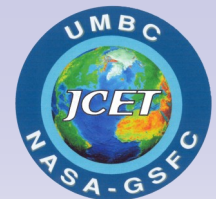


Dr. Jae Lee discussing her research at the JPL Postdoc Day.

on climate responses to solar forcing.

**Dr. Simone Lolli**, Assistant Research Scientist, is working with Dr. Judd Welton at GSFC on the impact of aerosols on radiative transfer.

**Dr. Lorraine Remer**, Senior Research Scientist, comes to us from NASA GSFC. Dr. Remer is collaborating with Drs. Hoff and Martins at UMBC on aerosol research.



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