



# JCET NEWS

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## From volcanic ash to desert dust: Aerosols from around the world being analyzed at UMBC

How is light is absorbed and scattered by small particles? What are the physical mechanisms that interconnect aerosol characteristics (size, shape and composition) to their spectral optical properties? These are some of the questions Adriana Rocha Lima is exploring in her PhD. She completed her Bachelor's in Physics and Master's in Science at the University of Sao Paulo – Brazil. In 2009, she joined the Atmospheric Physics Department at UMBC, where she started working at LACO (Laboratory for Aerosol, Clouds and Optics) advised by Dr. Vanderlei Martins, JCET Fellow.



**Adriana Lima in front of the Eyjafjallajökull Volcano in Iceland**

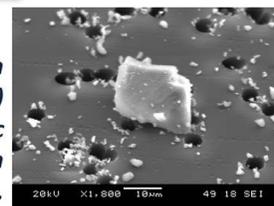
Most of Adriana's research is performed in the laboratory, where she uses an aerosol generator to separate and resuspend the aerosol particles. These particles are collected on filters

and submitted to different analyses in which size distribution, shape, density, composition and spectral reflectance of the aerosol particles

*Eyjafjallajökul (Iceland) Volcanic Ash*



*Scanning Electron Microscope (SEM) image of Volcanic ash collected on filters.*



**Sample of the Eyjafjallajökull volcanic eruption (top) and SEM image of the same volcanic ash collected on filters (bottom).**

are measured. Adriana's main interest is on the retrieval of the refractive index of these aerosols. Refractive index is a complex system, containing both real and imaginary parts. The real part of the refractive index is related to phase velocity of the light, while the imaginary part is related to the attenuation of the light as it propagates through the material. They are fundamental optical properties of each material, and they often have strong spectral depend-

*(Continued on page 2)*

ence. The complex refractive index of aerosol particles is an important quantity required in atmospheric models, and better characterization is needed.

“One nice thing about my experience at UMBC is the opportunity to work on different projects. Participating in the Fennec Campaign in Central Sahara was a great experience. Aerosol Sampling Stations were deployed in the middle of the desert in Algeria and Mauritania to study the Saharan dust. I am also working with samples of volcanic ash collected in many places around the world.”

In 2012 Adriana attended the AGU Chapman Conference on Volcanism and the Atmosphere in Iceland.

“I was working with a sample from the Eyjafjallajökull volcanic ash for almost one year. Being able to visit the real location of the eruption was an amazing experience.”

*Article by Adriana Lima, PhD candidate with the JCET Graduate Fellowship for academic year 2013-14*

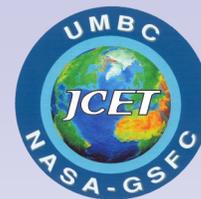
## Congratulations!

- The Applied Sciences Advisory Committee gave excellent reviews to the Applied Remote Sensing Training Program (ARSET) run by Dr. Ana Prados. Other JCET members supporting the program are Dr. Amita Mehta and current UMBC students David Barbato (UMBC) and Brock Blevins (UMBC Shady Grove).
- **Jae Lee** received the Outstanding Scientific Support Award for outstanding support of SORCE science and of TSIS instrument development for the NASA/NOAA JPSS free-flyer mission.
- **Tamás Várnai** received the Scientific Leadership Award for numerous contributions to understanding aerosol properties in the transition zone between cloudy and clear air.

## Upcoming Events

The Spring 2014 JCET Graduate Student Seminar series is off to a great start. This semester's topic is Wind Energy. Dan Miller kicked off the series with a discussion of wind flow modeling on Monday, February 10. (Photo right). The seminars are held on Mondays at Noon at UMBC in the Physics Building, Room 401. The topics are presented at the upper undergraduate, science major level. The seminars are open to all.

View schedule: <http://jcet.umbc.edu/?id=41500>



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