MAGIC

2013-06-14 update

A newsletter for non-scientists (and scientists) interested in MAGIC

All updates and other MAGIC information can be found at http://www.bnl.gov/envsci/ARM/MAGIC/.

In this update I will introduce some MAGIC people. One of the great things about MAGIC for me has been the opportunity to meet and interact with many people I wouldn't have otherwise met, from the ship's crew to technicians to other scientists and beyond. Uniformly these people have been great to work with and to get to know, and these interactions are a very large part of what has made MAGIC so fun for me. Also, as people are a rather intrinsic part of science, an introduction to some of these people is not out of place in this update. (As an aside, the *Spirit* left Honolulu a few hours ago to start Leg12B, so all is good with the world.)

During the summer those of us who work at a national laboratory can choose college interns to spend their summer with us doing research. Our department has had great success with this program in the past, and we have continued this success with this year's two summer students: Danielle Mallon and Michelle Gostic, who started last week. As an aside, both grew up on Long Island near the laboratory.

Danielle Mallon

Danielle recently graduated from University of Albany - SUNY (State University of New York) with a B.S. in Environmental Science (Atmospheric Concentration) and a B.A. in Earth and Atmospheric Science, both cum laude! She worked at NASA last summer, and during her school years she worked at the school radio and TV station (including announcing the weather). Next year she plans

to get a Graduate Geographic Information Systems (GIS) Certification back at U. Albany, and after that she plans to work in air quality and eventually get a Ph.D in some field of atmospheric sciences.

This summer she is learning the Python computer language. She will be looking at data from two of the aerosol instruments: the Condensation Particle Counter (CPC) and the Ultra-High Sensitivity Aerosol Particle Spectrometer (UHSAS). Each of these two instruments measures aerosol concentration (the number of aerosol particles in a given volume), but they have different size ranges. The difference between the two values gives the number concentration of aerosol particles in the intermediate size range, which is of great interest for aerosols over the ocean, as one outstanding question is whether the ocean produces many particles in this size range from breaking waves. She might also look at data from the Particle Soot Absorption Spectrophotometer (PSAP), which measures the light-absorbing properties of aerosols at three wavelengths (i.e., colors).

Michelle Gostic

Michelle just finished her sophomore year at Cornell, in Ithaca, NY, and she is majoring in Environmental Engineering. She worked at Cornell last summer on a project involving the effectiveness and durability of a portable foam filtration system that could be used to provide safe drinking water in rural areas, and during the year she plays club basketball and teaches classes in tree climbing. This fall she will start a year abroad in Spain. She plans to get a Ph.D. in environmental or coastal engineering and wants to pursue a career in this field.

This summer she will be using (and expanding) her programming skills in MATLAB to examine data from the UHSAS and the nephelometer, an instrument that measures the scattering of light by aerosol particles at three wavelengths. In addition to the number concentration of aerosol particles, the

UHSAS also gives the aerosol size distribution (the number of aerosol particles in a give size range that are in a give volume), rather like a histogram of the particle sizes. From this, the light scattering can be calculated (if certain assumptions are made), and this value can be compared with what is measured. Hopefully the two values agree. If they do, this provides evidence that things are working as expected, but if they don't it could be an indication that something isn't working properly, or that the assumptions that were made aren't valid. Either way it's an important comparison.

Both Danielle and Michelle are smart, hard working, and very pleasant to interact with. They hit the ground running, and it's already been a busy summer for them. I insist they talk to some of the senior people in the department and attend all the seminars (we had three this week). I ask them to look at clouds on their way into work, and to record the weather every day. Naturally I ask them lots of pesky questions about why we want to study what we're studying, how the instruments work, how clouds and raindrops behave, and all sorts of things an atmospheric scientist should know (How big are raindrops? Why don't clouds fall down? What is air composed of?). I explain that the point of the questions is to challenge them and force them to think about the world differently than they have. They have rapidly seen how many things I don't know. I want them to realize that it's ok not to know something, but that if this something is important, they should know how to find the answer. They're picking it up rapidly.

I also tell them there are at least two types of speeches they have to learn for topics on which they work, specifically the elevator speech and the mom speech. The elevator speech is a two-minute explanation of what you're doing and why you're doing it to a friend in the same department in college whom you happen to meet on the elevator. This friend says, "Oh, you worked on MAGIC data. What's MAGIC, and why is it important?" or "How does that UHSAS thing operate?" and you've got a few floors to give your answer. The assumption is that your friend is a bright person who has some background in science, so you share some common knowledge base and don't have to explain from the ground up. The mom speech is similar, but the assumption is that your mother is like mine–smart and interested in what I'm doing, but without a science background. Thus the students will need to explain their work, and the importance of it, to such a person in two minutes in a way that the person remains interested (i.e., no technical jargon or math) and that they can understand it. I think these are good skills for any scientist to develop.

Warren Wiscombe in the AMF2

Warren at Steamboat Springs

Another person whose role in MAGIC cannot be overestimated is Warren Wiscombe. Warren visited Brookhaven National Laboratory this week and gave a great seminar on exoplanets (planets not in our solar system) today. This was his farewell seminar. Warren is retiring from NASA after many years there, and for several years he spent one week a month at Brookhaven. He came into my office several years back talking about MAGIC (before it was MAGIC) and asked me if I would like to be part of it. I jumped at the chance. He and I spent a lot of time getting it planned, getting the proposal written, and things like that. I remember we were trying to come up with an acronym for the project (this is before we chose MAGIC), and we had various letters to work with: M for marine, A for ARM, G for GPCI (the modeling line; see the 2011-12-15 update), P for Pacific, and so on. Knowing my interest in birds (see the 2013-05-29 update), he suggested MAGPIE, which would have been a great one (except for the lack of any relevance to the project). He also had an acronym that spelled out Moma Lombardi's, a nearby restaurant that he likes. His plans are to retire this fall and move to Northern California and write books. He's been a great friend, a fun collaborator and co-conspirator, and a great resource, and I plan on seeing him this fall in California after a conference in San Francisco. Stay in touch, Warren!

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Please address any questions or comments to elewis@bnl.gov.