

also routinely appear in the media as topical experts. For example, Tom Mote (longtime ASP director and department head of Geography) was quoted in hundreds of media outlets worldwide in the summer of 2012 for his work on Greenland icemelt.

UGA ASP faculty have also assumed leadership roles as National Research Council, NASA, DoE and NOAA advisory board members, editors and associate editors of journals such as *JGR-Atmospheres*, *Geography Compass*, *Climatology* Section and the *Journal of Applied Meteorology and Climatology*, and in elected positions in national organizations. Most notably, Marshall Shepherd, director of the UGA ASP and a Fellow of the AMS, was elected President of the American Meteorological Society for 2013 (PHOTO 2).

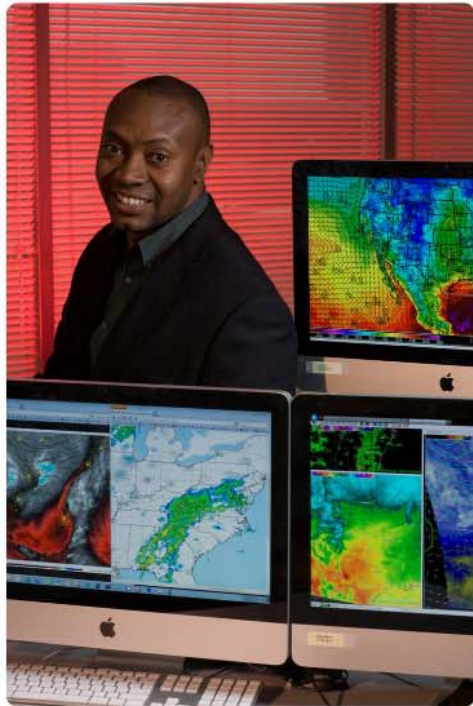


Photo 2: Marshall Shepherd, director of the UGA Atmospheric Sciences Program, in the Climate Research Laboratory on top of the UGA Geography/Geology Building.

ASP faculty have also received college-wide, university-wide, and national recognition for excellence in teaching. Dr. John Knox was deemed one of "The Best 300 Professors" in the United States by the Princeton Review. UCAR President Thomas Bogdan noted that "the curriculum for UGA's Atmospheric Sciences program is highly innovative and forward-looking, offering an unusually broad interdisciplinary focus that ranges from anthropology to geography, while retaining the fundamentals so critical to our field of study" [<http://columns.uga.edu/news/print/university-elected-to-atmospheric-sciences-consortium/>]. We emphasize collaboration, as exemplified in



Photo 3: The UGA student chapter of the American Meteorological Society with Ginger Zee, in front of the UGA football stadium next door to the Geography/Geology Building.

multi-author undergraduate research publications in leading journals such as the *Bulletin of the American Meteorological Society* and the *Journal of Climate*, and award-winning forecast teams in the WxChallenge competition.

New UGA ASP initiatives in 2013 include:

- 1) partnering with the Department of Geography and NASA through DEVELOP, a national student internship program to enhance training and development in earth science. This collaboration is only the second that is housed strictly at a U.S. university;
- 2) innovative curricula, including a new Introduction to Data Assimilation class and a unique Ph.D.-level seminar "Deconstructing Superstorm Sandy" (<http://deconstructingsuperstormsandy.blogspot.com/>) that brings together students across disciplines to research the scientific and societal aspects of Sandy; and
- 3) a series of high-profile activities hosted by UGA's student AMS chapter (<https://www.facebook.com/UgaAms>), including attendance at regional and national meetings, development of a weather calendar, and nationally known speakers such as "Good Morning America" meteorologist Ginger Zee, Weather Channel experts Bryan Norcross and Tom Niziol, and Weather Underground founder and blogger Jeff Masters (PHOTO 3).

We're a young and relatively small program, which afford us the advantages of flexibility and camaraderie. Our students are being prepared for the 21st century's challenges and opportunities, while our faculty are innovating and providing pathways for future questions facing science and society. We hope to see you at an AGU meeting or come and visit us in Athens!

Interview with Julia Hargreaves

Hans von Storch

Julia (Jules) Hargreaves took physics at Oxford University, where she received her BA in 1991; her PhD was in Astronomy and Astrophysics, 1995, from Cambridge University. From 1995-2001 she studied spectral wave modelling at the Proudman Oceanographic Laboratory, UK. In 2001 she commenced research in climate change in Yokohama Japan. Since then she has worked in the same room of the same building, although the institute has gone through several changes in identity; initially it was Frontier Research System for Global Change and now it is called the Research Institute for Global Change.



A photo of Jules taken quite recently.

What would you consider the most two significant achievements in your career?

Scientifically, I think the thing that's most significant is my work towards using paleoclimate simulations for quantitative evaluation of climate models and for predicting climate change. This is something I've been working on for a few years now and there's no one specific paper that stands out for me, but it's still very much an ongoing and active area of research. The aim is to move beyond merely saying "the models look reasonably good" and

continued on page 6

to produce more specific and scientifically defensible assessments of how good (or bad!) they really are and how much this impinges on future climate change predictions. Something that I hope may have more of a cultural impact is the establishment of the journal *Geoscientific Model Development* (GMD), a revolutionary journal (at least in the eyes of the dotting Executive editors) which focusses on publishing and documenting computer models in the geosciences. In the world before GMD existed, authors were struggling to publish detailed descriptions of models, with the consequence that the most fundamental tools of our trade were left largely undocumented and thus unreproducible. It was also apparent to me that such a journal was even more of a requirement in the climate sciences where non-publication of models leaves the science potentially exposed in this highly politicized field. It wasn't long until Dan Lunt had the same idea and brought his large array of contacts into play, including Rolf Sander, and the two of them have really done most of the work. I have always found the EGU to be very forward thinking, and hoped that the journal could join their stable, and in the end that's exactly what happened. The revolution continues apace.

You are presently working as senior scientist in the paleoclimate group, in the Research Institute for Global Change (RIGC) in Yokohama, Japan. How is it for you to live and work in a country with a rather different culture, in terms of everyday life and in terms of scientific practice?

I find that Japan is so upside-down that it causes me to continually question my assumptions about the world, and I think that has had the most positive influence on my work. Daily life is easy. We have never been short of funds for equipment or travel. In fact we tend to have too much. Our research has been funded by large consortium grants and thus our administrative overhead is really quite slight. The Japanese approach to climate science is very different to that in the UK. I think this is because the Japanese are less questioning of authority and therefore tend not to ask "why" so readily. However, they are quite happy with asking "how?" and team-working skills are also strong. In some respects, the inefficiency of Japanese science is striking. On the other hand, when we worked in the UK we were so driven towards so-called efficiency that there was little time for any creative thought. Those Japanese who we collaborate most effectively with tend to be those who have spent time abroad, which may not be entirely coincidental. I do have a communication problem with the Japanese, as my language abilities are rather poor, and fluency in English is rare among the Japanese. This lack of people to talk to has had a positive



A cherry blossom party in 2009, with Jules' Uncertainty Group, and the Paleo-climate Group, led by Ayako Abe-Ouchi (who is taking the photograph).

effect of encouraging the development of strong working relations with scientists in Europe and the USA, whom I physically meet only very rarely. One of your previous interviewees, Nanne Weber had a particularly strong influence on me. Her regular emails, full of wisdom and sanity, were a kind of life-support, and despite the fact I met her physically only a handful of times, she left quite a hole in my life when she passed away.

Your husband is another British climate scientist – does this mean that scientific issues are a permanent presence in your personal lives?

When I was a teenager I decided that it would be a good idea to find a scientific husband to work with. But I was very lucky. I had no idea I'd find one with such a blazing-fast CPU as James [Annan]! As for science invading my personal life, I find that climate science is one of those professions where one is always on duty. As soon as I tell people what I do, I get the 3rd degree. I find this much more of an intrusion to my personal life than the fun of discussing a scientific problem with James on a Sunday lunchtime.

There are more couples, with both partners being climate scientists. What would you suggest to such couples – should they strive to work in related fields or is distance of research fields beneficial? You publish most papers together with your husband – does it happen that people find it difficult to properly attribute your, or his, contribution to the work?

The way our situation has evolved is an adaption to circumstances so I wouldn't want to offer advice, other than to be adaptable and to try to let ego take a second place to science. That we work quite so closely together is probably a consequence of being stuck in Japan with no one else to talk to for the first few years we were here! However, with similar interests but different skills, I think that James and I together make a very capable scientist. I'm a physicist and he a mathematician. I tend to push collaborations and have lots of ideas. James is incredibly "realistic" about the bad ideas, but takes the good ones and makes them into better ones. You might be amused to know that over the last few years I was James' line

manager. While I doubt this would be tolerated in most places, there seems to be no rule about it in Japan, and it worked surprisingly well. Coupled with the fact that he writes most of the words on our blog ["James' Empty Blog", <http://julesandjames.blogspot.jp>], he definitely gets a lot of the credit, but also takes the blame, which seems a fair swap to me.

Do you notice a gender bias in perception of achievements, in Japan or in Great Britain?

This is very difficult to answer in a short interview. While acknowledging that there are huge differences in the societal roles adopted by men and women in Japan, speaking personally I have been treated with very little gender bias. The reason is that my cultural identity is "foreigner in Japan", and within this identity, gender is an irrelevance. Although being always treated as a foreigner gets tiresome in some ways, in others it is a big advantage. It was certainly a unnerving experience when I first arrived in Japan, and people started taking notice, and acting on what I said. "Is this what life is normally like for men?", I wondered. It changed my behaviour. When I found that people started to act on my advice I had to start to think much more carefully before opening my mouth.

The relative number of females is very skewed in atmospheric and related sciences. Should this be overcome, and which measures would you suggest?

I think that gender ratios are not the main problem holding back scientific progress. The old-boy network is a much more dangerous thing. People seem to like forming little cliques of people much like themselves. I thought that the study by Nature recently into the gender bias of their male and female editors was very illuminating. We all need to be aware of our biases and make a point of inviting people that we don't know well to join our groups - whether that's asking people to review papers, inviting people to conferences, or job interviews. For the best cross-fertilisation of ideas we need to invite young people without famous supervisors who work in institutes we haven't heard of. The same is true when it comes to evaluating the science of others. When James and I moved into climate, we came from other fields so we had no big name mentors to put on our papers. A decade later it is noticeably easier to get our papers accepted. I find this disturbing as it ought to be possible to assess the science without considering the person, or the reputation of their workplace. I think we too often ignore the ideas of younger scientists, and too often fail to argue with the well-established.

When you look back in time, what were the most significant, exciting or surprising developments in atmospheric science?

I recently met someone who had the Lisiecki & Raymo benthic stack permanently tattooed on

their forearm. While I wouldn't want to go that far, I think that these kinds of detailed paleoclimate records, such as the ice cores from Antarctica are the most entrancing developments in climate science in recent years.

Is there a politicization of atmospheric science? Is this different in Japan than in your home country, Great Britain?

Climate science is certainly very political. Since I do all my science in English, I am, however, only really aware of the English-language politics. We are quite well protected from it here, but it seems that in such an environment it can be difficult to be rational and realistic about climate change. In order to publish in high

impact journals the numbers must keep getting bigger and the outcomes more scary.

What constitutes "good" science? Is this the same in Japan as in Great Britain?

I'm looking for the third way. The British are all about flashy big-picture ideas. On the other hand the Japanese prefer to disappear down into the obscurity of minutiae. The UK is riddled with assessment, requiring every little step forward to be hyped and sent to Nature, whereas in Japan, promotion can more surely be gained by doing everything your boss asks you to, with publications playing a rather minor role.

What is the subjective element in scientific practice? What is the role of instinct?

I think that "gut feeling" is merely the way our brains inform us about the aggregation of our experiences. As we gain more scientific experience our gut instincts are honed, and we can more efficiently solve problems. On the flip-side, while science ever advances, as we age and our minds become more rigid and less able to absorb new information, until eventually our gut feelings become too inaccurate to be useful. Then we definitely ought to retire!

The opinions expressed in this interview do not necessarily represent those of the reviewer or the AGU.