Looking for Editor-in-Chief

Our section is looking for a new Editor-in-Chief for this newsletter beginning January 2011. Duties include: collecting and distributing announcements of activities related to Atmospheric Sciences, Section news, interviews, scientific news, reports from meetings, and job announcements. You will manage a team of Contributor Editors and will decide about the contents of each issue.

If you desire to contribute to the AGU as an active part of our community in a engaging and interesting role, this is a good opportunity. You will participate in the Atmospheric Sciences Section and work with top researchers and leaders in the community. Also, you will develop communication skills and enjoy visibility among an AGU Section with more than 10,000 affiliates. We encourage your application. Open to everyone, this is an excellent opportunity for an advanced Ph.D. candidate or postdoctoral researcher. Part-time professionals might also consider applying.

To apply, send a statement of your background and interest in doing the job, along with a CV to Prof. Alan Robock (robock@envsci.rutgers.edu).

Interview with Alan Robock

Hans von Storch

A young Alan Robock, in Kauai in 1990.

Dr. Alan Robock is a Professor II (Distinguished Professor) of climatology in the Department of Environmental Sciences at Rutgers University. He graduated from the University of Wisconsin, Madison, in 1970 with a B.A. in Meteorology, and from the Massachusetts Institute of Technology with an S.M. in 1974 and Ph.D. in 1977, both in Meteorology. Before graduate school, he served as a Peace Corps Volunteer in the Philippines. He was a professor at the University of Maryland, 1977-1997, and the State Climatologist of Maryland, 1991-1997, before coming to Rutgers. At Rutgers he directs the Rutgers Undergraduate Meteorology Program. Professor Robock has published more than 290 articles on his research in the area of climate change, including more than 165 peer-reviewed papers. His areas of expertise include geoengineering, climatic effects of nuclear war, effects of volcanic eruptions on climate, regional atmosphere-hydrology modeling, and soil moisture variations. He serves as Editor of Reviews of Geophysics, the most highly cited journal in the Earth Sciences. His honors include being a Fellow of the American Meteorological Society and a Fellow of the American Association for the Advancement of Science (AAAS). Professor Robock is a Lead Author of the upcoming Fifth Assessment Report of the Intergovernmental Panel on Climate Change, which was awarded the Nobel Peace Prize in 2007. He currently serves as Past-President of the Atmospheric Sciences Section of AGU and Chair of the Atmospheric and Hydrospheric Sciences Section of AAAS.

You have important positions in both AGU and AAAS. What is the role of such organizations in times of climate change and the sometimes difficult interaction of policymaking, politics and science?

I am currently the Past President of the AGU Atmospheric Sciences Section and the Chair of the AAAS Atmospheric and Hydrospheric Sciences Section. The primary role of these societies is to produce excellent peer-reviewed journals to publish the results of our science. In addition, the other major role of AGU is to provide the Fall Meeting and other smaller meetings to enable scientists to meet, share their recent results, and organize new scientific projects. In addition, it is the role of both societies to inform the public and policymakers about the science we have produced in a form that they can understand. One mechanism is seminars in Washington, DC, for Congressional staffers and others working on policy issues. The AAAS Annual Meeting also serves this purpose, by presenting new science in a way that non-experts can understand.

It is not the role of the societies to advocate specific policies in response to scientific findings. But we need to make sure that our science is not misrepresented in policy discussions. And we need to defend scientists who are attacked for just doing their job. For example, it is important to issue a condemnation of Virginia Attorney General Kenneth Cuccinelli's ongoing attack on academic freedom at the University of Virginia, and in particular on the work of Michael Mann. It is also the role of our societies to advocate for funding for our scientific research and for improved science education throughout the school system from kindergarten through universities.

Some people see political adversaries at work, who want to undermine the authority of science, and advocate different world views, for instance creationists or climate change deniers. How should science deal with such challenges?

We have to deny the deniers. However, we are not trained as politicians or in public relations. And we do not have the massive budget available to those whose interest is in confusing the public about global warming, so they can continue to sell products that use the atmosphere as a sewer and produce global warming. The one thing we can all do as individuals is continue to produce good science. I think we also have an obligation to explain our science to community groups, schools, friends, and in the media. I offer courses and lectures at my university for non-scientists. I never say "no" when asked to give a talk at a school, at a senior-living center, at a Rotary Club, or on television. For example, I appeared on CNN twice in November, 2009, during the Copenhagen conference. Although the network found it necessary to provide people to debate the science with me, it was easy to counter them and I felt good

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about the opportunity to educate a much larger audience than I usually address. Through our societies, IPCC, and individually, we just have to continue to tell people about what we know. For our individual careers we have to publish in peer-reviewed literature. But for the good of the planet, we also have to inform the general public.

How do you see the role of the IPCC, for the public, for science and for policymakers?

It is the role of IPCC to assess the latest science and give an objective, non-political view of what we know and what we do not know, so that the public and policymakers can make informed decisions in response to climate change. The IPCC has a rigorous writing and reviewing process, which insures that all information is evaluated and considered without prejudice. Working Group I, The Scientific Basis, for which I am a Lead Author for the Fifth Assessment Report and which is now being written, has produced very detailed reports, with no errors that have been discovered. Minor errors in the last Working Group II report have been exploited by global warming deniers, but the entire report provides an excellent summary of the global consensus on climate change, and there are no other legitimate views that should be taken seriously. As for the impact on science, IPCC does not generate or drive science – it only assesses science, but questions it brings up do inspire curiosity-driven research. For example, the global climate modeling community is now conducting the Coupled Model Intercomparison Project 5 (CMIP5), the results of which will form the basis for much of the analysis in the Fifth IPCC Assessment, which will be completed in 2013.

Is there a politicization of atmospheric science?

When our science has policy implications, those affected, such as oil and coal companies, act politically. However, I have not found the process of science among scientists in my discipline to be politicized. Ideas advance on their merits, not based on who writes them or due to any outside influence. The editorial process works, by using peer-review, and serves to improve scientific content and communication of new ideas. As we all know, things sometimes slipthrough that later prove to be wrong, but the scientific process, by continuing to evaluate and question accepted ideas with new ideas and data, corrects such issues.

What constitutes "good" science?

Because new scientific knowledge that will be created is by definition unknown, and because the use to which scientific knowledge will be put cannot be known in advance, it is difficult to define a priori what is good. In my value system, scientists should work hard on topics about which they are curious, and publish their work so that all can be able to access the new knowledge. But if you find that your work can be used for what you consider to be evil purposes, then it is your obligation not to do the work. If you find dangers to society as a result of your work, it is your obligation to warn society of them. If you find positive contributions you can make from your work, it is good to work on those aspects.

What do you think about the relationship between science and media?

With a few exceptions, the media does a poor job of educating the public about science. I think that is because they do not see that as their job. Their job is to sell newspapers (or whatever the current medium is), and they do this by sensationalizing their stories. They exaggerate new results, rather than treating them as incremental hypotheses. They try to find conflict rather than agreement. And they are taught in journalism school that you need to show both sides of each issue. This is a fair way to treat political views, for example, but not to treat our field of endeavor, where by and large there is a consensus and agreement on basic understanding. In addition, science journalists are disappearing from major media outlets, and not being replaced. For some reason, editors think they need specialists to report on sports, but that general reporters can report on science. The result is quite uninformed news articles, often with errors, and a diminishing understanding of science by the public. Therefore, we need to seek independent means of getting scientific information to the public, and not depend on the media.

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

Subjectivity cannot be removed from science. To start with, we make subjective judgments about what research to undertake. We make subjective decisions about stopping certain lines of research. And we make subjective choices about how much time to spend on our work, and on how to divide our work time on research, teaching, administration, and public outreach. Both scientific culture and different national cultures affect how we behave, and how scientific research programs are organized and funded. My feeling is that large organized projects such as those that develop satellite and other observing programs or general circulation modeling centers, with models, computers, and technical support, are crucial to science, but they also need to be combined with curiosity-based work by individual investigators and small groups. Instinct is important to recognize new concepts when analyzing data and model outputs. I am always inspired when I think of Ed Lorenz recognizing chaos when he got diverging results after repeating a calculation started with slightly different initial conditions.

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

The most significant achievement is my work on nuclear winter. In the 1980s, by running climate model simulations, doing studies of the impacts of forest fire smoke on surface temperature, and by writing about policy implications, I am proud to have been part of the team that warned the world of the danger of the use of nuclear weapons. Nuclear winter theory led to a vigorous discussion of the direct effects of the use of nuclear weapons and a realization that the nuclear arms race was crazy and dangerous, and that the use of nuclear weapons would be suicide. This led directly to the end of the nuclear arms race, several years before the end of the Soviet Union. Mikhail Gorbachev, then leader of the Soviet Union, described in an interview in 1994 how he felt when he got control of the Soviet nuclear arsenal, "Perhaps there was an emotional side to it…. But it was rectified by my knowledge of the might that had been accumulated. One-thousandth of this might was enough to destroy all living things on earth. And I knew the report on 'nuclear winter.'" And in 2000 he said, "Models made by Russian and American scientists showed that a nuclear war would result in a nuclear winter that would be extremely destructive to all life on Earth; the knowledge of that was a great stimulus to us, to people of honor and morality, to act in that situation." [Robock and Toon, 2000]

I am now working with Brian Toon and other colleagues to warn the world that the current reduced American and Russian arsenals can still produce nuclear winter, and that even a nuclear war between India and Pakistan could produce climate change unprecedented in recorded human history. We are frustrated that people are not paying as much attention to our results as people did previously, but I was honored in September, 2010, by an invitation from Fidel Castro to come to Cuba and give a talk about nuclear winter. He listened for an hour to my talk and then wrote extensively about the need to rid the world of nuclear weapons. For the story (continues on the next page)

of my trip, please visit:
http://climate.envsci.rutgers.edu/Cuba/

The other most significant accomplishment is my contribution to the understanding of the effects of volcanic eruptions on climate, including the winter warming phenomenon. These results are summarized in my most highly cited paper, Robock [2000], and since then I have continued to work with my students on this topic by producing an update ice-core-based time series of volcanic forcing for the past 1500 years and to better understand the effects of high latitude eruptions.

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

In 1974,when I was a graduate student at MIT and my Masters' advisor, Norman Phillips, left, I talked with other faculty members looking for an advisor and Ph.D. dissertation topic. Ed Lorenz told me, "Climate would be a good field to get into these days." It was brilliant advice and I was lucky enough to follow it. I found in my Ph.D. dissertation that increasing CO_2 would affect future climate and published the first transient climate model simulation of the effects of CO_2 on climate [Robock, 1978]. What is surprising and exciting to me is how this topic has slowly, and now more rapidly grown to become a dominant issue for the planet. It is the subject of international negotiations, political campaigns, criminal theft of private emails, and multi-million dollar lobbying and disinformation campaigns by multi-national corporations.

Another topic is the increasing skill of weather forecasts. When I was younger and told people I was a meteorologist, they said, "You guys are always wrong." Now they say, "Will it rain tomorrow?" Although we clearly understand that there is fundamental limit to predictability, accurate weather forecasts have become more and more an assumed part of people's lives for several days into the future.

Would you recommend that students go into an interdisciplinary degree program?

No. To work in an interdisciplinary or multidisciplinary or transdisciplinary field, first you need to have a discipline. Certainly progress in science depends on various members of a team contributing their own expertise, but each person needs to be an expert in a field. I would tell students to go deep into a narrow area, learn how to be a scientist, learn various techniques, such as data analysis, instrumental design, and modeling, learn how to write papers and proposals, and most importantly learn how to ask scientific questions. If a person becomes spread too thin at the beginning, they will not learn as well how to be a scientist. Only after becoming a scientist in a discipline can they contribute to an interdisciplinary team.

Signed photo of Fidel Castro Ruz and Alan Robock, September 14, 2010, taken in Havana after the nuclear winter lecture by Alan Robock.

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The opinions presented in the interview do not necessarily represent those of the interviewer or the AGU.

Douglas R. Worsnop: Kaufman Award winner

Anna B. Harper

Congratulations to Dr. Douglas Worsnop for receiving the Yoram J. Kaufman Award for Unselfish Cooperation in Research. As evidenced by his credentials, Worshop's research career and collaborations cover a range of disciplines and span many miles. He is the Vice President of Aerodyne Research, Inc. (ARI), the Director of their Center for Aerosol and Cloud Chemistry, and a Finland Distinguished Professor in Physics at the University of Helsinki. Worsnop is co-author of more than 200 publications, as of January 2010. He was named an AGU Fellow in 2007.

Worsnop earned a Ph.D. in chemistry from Harvard University in 1982, and then spent three years in Freiburg, Germany, as a Humboldt Fellow in physics. International collaborations have benefited his personal life, as well, because he met his wife while in Germany. In 1985, they moved back to the U.S. and Worsnop started working at Aerodyne Research, Inc., a private company that provides R&D services and advanced instrumentation in areas such as atmospheric and environmental science, energy and propulsion technologies. One landmark milestone in his career was developing the Aerodyne Aerosol Mass Spectrometer (AMS), which enables ambient field measurements of the chemical composition of sub-micron sized particles. His work with the AMS has created the opportunity for numerous collaborations.

As one nomination letter stated, "The AMS community is an amazing collection of people who work in Doug's spirit: together they improve the instrument, develop the science, share ideas, work openly and support each other."

Worsnop also enjoys advising and mentoring graduate students and post-doctoral scientists, something not usually available for people in the private sector, but his passion for these things has prompted him to pursue opportunities beyond Aerodyne's walls.

Another nomination reads: "Doug Worsnop stands for everything that the late Yoram Kaufman symbolized: altruism, enthusiasm, curiosity-driven science and the willingness to share it, and an unstoppable will to spend time with young and established scientists in order to help them do real and exciting science."

Worsnop made time in his busy schedule to tell us a little more about himself, as he
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