



Eugenia Kalnay  
United States of America

“ The most important thing is to devote yourself to what you like best, regardless of the pay or recognition, because this will come if you do your work with passion ”

Interview by Anneke Levelt Sengers\*



Eugenia Kalnay

Meteorologist. Distinguished University Professor, Department of Atmospheric and Oceanic Science, University of Maryland, USA.

### Main research interests at this time

I am an expert on numerical weather prediction, which is the science of developing computer models of the atmosphere, and combining them with atmospheric observations, in order to predict the weather. My book “At-

mospheric Modeling, Data Assimilation and Predictability” (Cambridge University Press, 2003) is widely used as a graduate course text. I have worked on the impact of land use on climate change, and currently I am also working on developing models that couple models of the earth system (atmosphere, ocean, land, etc.) with models of the human system (population, economy, etc.) in order to study the feedbacks between population and climate change.

### Accomplishments and achievements she is most proud of

- The substantial improvement of the weather forecasts due to our research during the ten years (1987-1997) I was the Director of the Environmental Modeling Center (EMC) of the National Centers for Environmental Prediction (NCEP) at the National Weather Service.
- The NCEP-NCAR (National Center for Atmospheric Research) 50 years Reanalysis of the atmosphere I directed. The NCEP-NCAR Reanalysis gives the state of the atmosphere every 6 hours, and is a very widely used data set (the paper describing it has over 7000 citations, a record in geophysical sciences), because it makes easily available to any interested researcher information that was previously only available at large centers of weather research and forecasting.
- Being the PhD advisor of about 15 brilliant women and men from all over the world.



Eugenia Kalnay and her family

## Honors and awards

In 2009 I received perhaps the most prestigious prize in Meteorology, the IMO Prize of the World Meteorological Organization, only the second woman to be so honored. I have been elected Fellow of the American Association for the Advancement of Science (AAAS), the American Geophysical Union (AGU) and the American Meteorological Society (AMS). I have received a gold medal from NASA, and two gold medals from the Department of Commerce, where the National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service reside.

I am a member of the National Academy of Engineering (US), a foreign member of the Academia Europaea, and a corresponding member of the Academy of Sciences in Argentina.

## Why she decided to enter a science career

When I was a girl, I always wanted to study medicine. However, as I was finishing the girls-only high school I attended in Buenos Aires, a brilliant fellow student whom I respected

very much, said to me: “you are very good in math, you should study physics instead of medicine” and I immediately decided to enroll in the School of Exact and Natural Sciences at the University of Buenos Aires.

That was a wonderful decision: I experienced for the first time in my life the joy of science. I can still remember the emotion I felt when I understood the meaning of Newton’s third law (action and reaction) or how to program the Turing machine.

The education I have received at the University of Buenos Aires’ School of Science was not only free of charge but also of such superb level that compared to it, graduate school at MIT was easy to me. I had other cultural surprises when I arrived at MIT in 1967. In Argentina about 40% of the science students were women, so I assumed that in the US, being much more developed than Argentina, surely the number of women students would be closer to 50%. I almost had a heart attack when I found I was the only woman in the Department of Meteorology. Then I became the first student to become pregnant, the first woman to get a PhD in the Department, and the first woman to become a Professor. I was promoted later from Assistant to Associate Professor, but without tenure, so I decided to move to NASA Goddard in 1979. I note that since that time, MIT and the US in general made profound changes for the better that started

with the women’s liberation movement in the 70s and 80s.

When I tutor undergraduate women in science they tell me that they feel women have the same opportunities as men. This is truly an amazing change that has taken place in the US!

[Why is it important for women to be in science?](#)

I know from my experience at the University of Buenos Aires that, if not discouraged by society, about half of the science students and professionals are women. With this experience (and a similar one at the University of Uruguay where I worked after I got my PhD), this question seems almost silly. Of course, women should be in science! Why would one even think of wasting the brains of half of the scientifically inclined population?

[Who or what is your inspiration for doing science?](#)

My mother, who raised my younger sister and me after my father died when I was 14, pushed me to go to the university. I remember her saying when I first started dating: “Don’t even think of getting married before getting a PhD” (I disobeyed her). Then, after I enrolled in physics, she discovered that there was a competition for scholarships of meteorology

students sponsored by the National Weather Service in Argentina. My mother signed me up and changed my major in the application forms from physics to meteorology, a science that until then I had never heard about. After I started studying meteorology I was extremely grateful to my mother for this change, since it is the physics of the atmosphere (and now more like the physics and biochemistry of the full earth system). It can also be considered as environmental engineering. I enjoy working with students and colleagues on improving weather forecasts and studying climate change, and feel like our work benefits humankind.

What were the main barriers you experienced, and how have you overcome them?

To be honest, except for the loneliness of frequently being the only woman in meetings, I did not experience formal barriers. I did feel psychological barriers at NASA when my boss, Milt Halem, was promoted and I reluctantly replaced him as Branch Head at the Goddard Space Flight Center. My predecessor was very successful with a rather confrontational management style accepted by the very bright Branch scientists, and I could not possibly follow his style. I decided instead to follow the style of a Quaker woman who chaired a group on Human Rights in Boston. When we first met, she said we would follow the Quaker



Eugenia Kalnay and her international colleagues Kang, Miyoshi, Greybush and Ruiz.

approach of working by consensus, and to my big surprise, after a couple of sessions, it worked well even though the group was very heterogeneous. I was also very surprised when the consensus approach plus gentle nudging worked also extremely well in my Branch of aggressive scientists, all men except for one woman and me. One of the problems I had (before becoming Branch Head) was that the men had a tendency to interrupt me when I started talking. I solved that problem by speaking more forcefully and interrupting back. However, I once had to tell one of the scientists after a Branch meeting: "Have you ever noticed that every time she (the only other woman in the Branch) starts talking,

you interrupt her?”. My colleague was very surprised and denied that he ever did that, but afterwards he stopped interrupting her. Another annoying problem that I was never able to solve was that some men would never look at me when talking, instead they would look at the man on my left and then at the man on my right (even though I was their boss). Just looking hard at the speaker did not work. Fortunately, younger men almost never do that anymore.

What made you decide to do your PhD work in the US, and how did you go about finding a graduate program that was willing to accept you?

I attended the School of Sciences of the University of Buenos Aires, which, under the brilliant direction of the Dean, Dr. Rolando Garcia, became one of the very best in the world. After I graduated in 1965 I continued working as a teaching assistant. The military overthrew in June 1966 the elected government of Arturo Illia, and on July 29 1966 attacked the School of Sciences, savagely beating with long police batons, and then detaining, more than 400 professors and students that had taken over the building (an episode known as “La Noche de los Bastones Largos”, or “the Night of the Long Batons”). As a result thousands of faculty and assistants (including me) resigned in protest from the university, and many of them left the country, leading to a tremendous brain drain for Argentina.

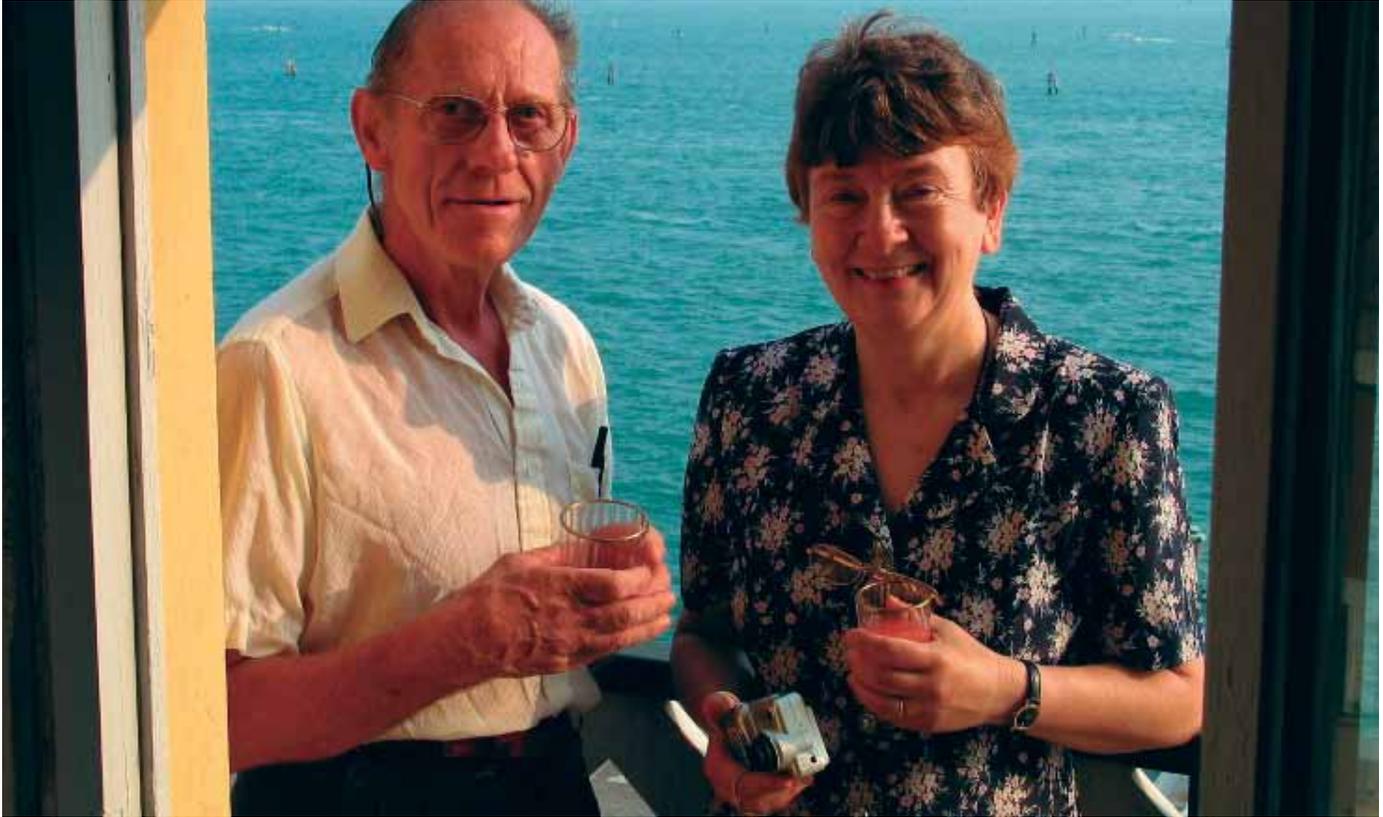


Eugenia Kalnay, meteorologist and professor at the Department of Atmospheric and Ocean Sciences of the University of Maryland, USA.

Dr. Garcia, who is a meteorologist, still active in his 90s, contacted Prof. Jule Charney at MIT and several other universities to secure a possibility to do a doctorate for the many students that had been left jobless. Prof. Charney kindly offered me a Research

Eugenia Kalnay has conducted studies on the impact of land use on climate change. She is currently collaborating in the development of models that connect to land system models.





Eugenia Kalnay and her husband

Assistantship, and the Ford Foundation paid for my travel from Buenos Aires to MIT in January 1967.

### Do you have a family?

My first husband, Alberto Rivas, came with me to the US in 1967, where he later got a PhD in linguistics at MIT with Prof. Noam Chomsky. Our son, Jorge Rivas, was born when I was still a student, in 1970. I remember

thinking that if I failed to get a doctorate, I would at least have a good excuse. I told the department chair, Prof. Norman Phillips, that I was pregnant, worrying that he would get angry, but he stopped for a moment and then said: "Now you are going to be creative in two different ways!"

Alberto died very young of cancer, and I was married in 1981 to Malise Dick, a transport economist who worked at the World Bank.

Malise was an incredibly supportive husband who encouraged me to take the challenging jobs that I was offered, first as Branch Head at NASA Goddard, and then as Director of the Environmental Modeling Center (NCEP/NWS/NOAA), even though I was very scared about accepting such responsibilities. Jorge Rivas, who is a political scientist, helped me when Malise died in 2007, and has given me immense happiness because of his principled commitment to social justice, and for his guidance in our collaboration on the development of a coupled model on population and climate change.

What do you like to do in your leisure time?

I love to bicycle, and I biked to work almost every day until I got slightly hit by a truck in May 2011. Fortunately I only broke my tibia. I really hope that I'll be able to bike again! I am very passionate about progressive politics, and about the future of mankind and the future that we are leaving to our children and grandchildren.

What is your advice to other women scientists?

The most important advice is to work on what you like to do, without worrying about money or recognition, which will come if you put passion in your work.

Learn to speak clearly, briefly and forcefully, and don't allow others to interrupt you! ■

\*Anneke Levelt Sengers, physicist, member of the NAE and the NAS, scientist emeritus at the National Institute of Standards & Technology (NIST), author of articles and books in the field of thermodynamics and critical phenomena of fluids, L'Oréal Prize Awardee. Co-Chair and USA Focal Point of the Women for Science Program of IANAS.