



IN CONVERSATION

“THE COSTS OF DAMAGE CAUSED BY EXTREME WEATHER CONDITIONS, PANDEMIC DISEASES AND GLOBAL MASS MIGRATION WILL ONLY GROW WITH TIME. WE CANNOT WAIT.”

Prof. Klaus Hasselmann
2021 Physics Nobel laureate

Prof. Klaus Hasselmann is a well known oceanographer and climate physicist. He is an alumnus of University of Hamburg, Germany and former Director of Max Planck Institute for Meteorology. Prof. Klaus Hasselmann has been involved in climate modeling. He is a pioneer in proving climate change through theoretical modeling. He has been warning against climate change for about 50 years. The Royal Swedish Academy of Sciences has awarded Nobel Prize for Physics 2021 to Prof. Klaus Hasselmann along with Prof. Syukuro Manabe (USA) and Prof. Giorgio Parisi (Italy) for the physical modelling of Earth's climate, quantifying variability and reliably predicting global warming. At the age of 90 years, Prof. Hasselmann is still active. Despite his very busy schedule, he took out time for the readers of *Science Reporter* and gave interview to Dr Meher Wan.

Meher Wan: *Many congratulations for the Nobel Prize! How do you feel when your work is recognized at the wider public level and recently by the Nobel Committee?*

Prof. Klaus Hasselmann: Thank you. I am overwhelmed and still cannot believe the honour I have received in the form of the Nobel Prize. Receiving this prize is like giving a boy a box of chocolates simply because he was deeply involved in building a Lego structure. In my life, I have always done only what I enjoyed and had fun with.

MW: *It has been a long journey for you. How difficult was it to make people understand that the theoretical modeling you did was right at the initial stage of your career?*

Prof. Hasselmann: When I began my climate research, the public and media interest in climate was essentially zero. But I was glad that my colleagues Mojib Latif and Hartmut Grassl had successfully taken on the task of communication with the media, because I preferred to deal with scientific problems and associated results.

MW: *So, how did your journey as a climate change researcher start? You were a hard core physicist.*

Prof. Hasselmann: This was shortly after the Club of Rome had published its first warnings that humans



were destroying the planet. We all read the book with great interest, and my scientific curiosity was stimulated. My friend David Keeling had already started in 1960 to measure CO₂ from the *Mauna Loa* mountain on the island of Hawaii, the largest of the Hawaiian Islands. The site was free from disturbing aerosols. At first nobody took him seriously. But later his curve became the standard reference curve for model computations.

In the first one and a half decades of my scientific life, I studied mostly wave dynamics, wave interactions, in particular ocean waves, and also air-sea interaction problems. This added substantial knowledge about the ocean to my thinking about physics and expanded my general interest, eventually leading to my investigations of weather and climate.

I extended wave dynamics theory also to other wave phenomena such as seismic waves and also to plasma physics. When I applied Feynman Diagrams to the latter, the idea came to me that I could understand elementary particle interactions through a new theory by adding to the four space-time dimensions eight extra dimensions, representing interacting non-gravitational wave components, as well as electromagnetic, strong, and weak forces. This theory combines the Special and General Relativity theories of Einstein. However, at that time I was already working on my first stochastic climate model and my ideas about particles remained a hobby.

MW: *How do you remember your childhood?*

Prof. Hasselmann: My family had to flee from the Nazis, and I grew up in England. It was a very different time. There was no television, no cell phones, and we played on roads with hardly any traffic. When we

didn't know what to do, we went to the nearby forest, made campfires, fried potatoes, climbed trees and explored our surroundings. It was a childhood dream full of curiosity and fantasies.

For me, that period was the inspiration for my career. I always wanted to discover how the world works. When I built my first crystal detector and heard voices from far away, I felt like the greatest explorer.

MW: *Your father was a journalist and raised voices for society. How did he inspire you?*

Prof. Hasselmann: My father was an economist and worked for the COOP movement, but also wrote articles for different newspapers and published books. That inspired my interest in economics which resulted in developing coupled economic-climate models.

MW: *The problem of climate change is clearly visible now and people are getting aware about it. What are the effective ways to solve it according to you?*

Prof. Hasselmann: We need to do much more than we have done in the last decades. We need efforts from everybody – on a personal level, on a political and especially on a societal level, especially in the rich countries. We need to push decision makers. The “Fridays for Future” movement is already stirring up governments and societies.

To solve the problem of global warming, it is now imperative to listen to scientists and engineers in order to understand the massive changes that are necessary to keep our earth alive, and to address the climate, the collapse of the variety of species, the accumulation of trash, social differences, mass migration, starvation, population growth, etc., etc.

My urgent advice to politicians is: *“The longer we wait, the more expensive this necessary transformation will be. In addition, the costs of damage caused by extreme weather conditions, pandemic diseases and global mass migration will only grow with time. We cannot wait.”*

MW: *Any message for the youth and young students?*

Prof. Hasselmann: If you like what you do, you will be, most likely, good at it too. Today many of you also have the urge to become involved in conservation, in environmental and climate protection. Some may wish to go into climate science. But keep in mind; you can make your contribution in any profession, on a small or large scale. Even though it's a great honour, I can assure you, it doesn't have to be the Nobel Prize. I have great faith in young people and in their strength and determination. So, go for it. I wish you all the best. Be creative and be happy!

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