

12. November 2021

Einladung zum Physikalischen Kolloquium

26.11.2021 **Peter Lemke, Alfred-Wegener-Institut Bremerhaven**
»And yet the Earth is warming (Und sie erwärmt sich doch!) –
Remarks on Climate research:
from the first steps to the Nobel Prize in Physics – «
Einführung: P. Braesicke

Discussions about climate started centuries ago. The first to suggest in the 1820s that the atmosphere acts as a blanket to keep Earth's surface warmer than it should be, was Joseph Fourier. He described what we today call the Greenhouse Effect. An experimental investigation of the radiative absorption of CO₂ was first undertaken by Eunice Foote in 1856. In 1896 Svante Arrhenius calculated the effect of doubling CO₂ on the surface air temperature to be 5-6°C. In his calculations in 1931, Hurlburt reduced this increase to 4°C.

The first comprehensive radiative-convective model for the atmosphere was presented by Manabe and Wetherald in 1967. They showed that an increase of CO₂ in the atmosphere resulted in a warming in the troposphere and a cooling in the stratosphere, as observations show. Manabe was the driving force to develop comprehensive models of the climate and Earth systems in the coming decades. For his contributions to the understanding of the climate system he was awarded a quarter of the Nobel Prize in Physics in 2021.

For a long time, it was not clear how to find the signal of rising CO₂ in the temperature records of the noisy environment of weather and climate variability. In 1976, Hasselmann suggested that changes of the slow climate variables are generated by the white noise forcing of the atmospheric weather. He also developed in the 1990s methods to find the "fingerprints" of human impacts on climate variability. These methods have been intensively applied to recent climate integrations describing various futures of Earth's climate. On the basis of these applications we can now state that the Earth is warming – and we are to blame

For his contributions to the understanding of the human fingerprint on climate warming, Klaus Hasselmann was awarded a quarter of the 2021 Nobel Prize in Physics.

Der Vortrag findet um 16:00 Uhr im Otto-Lehmann-Hörsaal, Physik-Flachbau (Geb. 30.22), statt. Bitte beachten Sie, dass das Betreten des Hörsaals nur unter Einhaltung der aktuell gültigen Landesregeln zum Infektionsschutz erlaubt ist.