

Cloud Science at Home: From Simple Experiments to Scientific Analysis of Animated Films and TV Dramas

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Clouds are natural phenomena deeply connected to the Earth's environment, weather, and natural disasters; thus, understanding their formation process is crucial in the field of Earth science. As part of public outreach activities for the general public and educational settings, this presentation introduces simple experimental methods that can be conducted at home. Furthermore, it reports on cases of disseminating scientific knowledge through entertainment works (animated film and TV drama) in which the presenter participated as a meteorological supervisor.

To deepen the understanding of physical phenomena, we first introduce two types of experiments. One is a cloud formation experiment using a plastic bottle, where spraying a small amount of alcohol into a soft bottle, twisting it for adiabatic compression, and rapidly releasing the pressure reproduces condensation caused by the adiabatic expansion of a lifted air parcel. This method is highly reproducible and allows participants to easily experience the fundamental principles of cloud formation. Another experiment involves the visualization of Bénard convection using steam. By placing an acrylic plate over a container of warm water, thermal convection occurring in the air layer between the water surface and the plate is visualized by the pattern of water droplets adhering to the plate. Since these convection cells exhibit various forms depending on the fluid depth and container shape, this serves as a highly flexible educational tool for learning about the diversity of convection in meteorology.

Second, the integration of scientific reality and artistic production is discussed through the analysis of media works. In the animated film “Weathering with You”, advanced meteorological phenomena are depicted, such as cumulonimbus clouds with overshooting tops and geometric scattering by raindrops within crepuscular rays. The heavy rain and snow events in the Kanto region portrayed in the film are based on actual low-pressure system cases. In the TV drama “Blue Moment”, the presenter was involved as a supervisor from the scriptwriting stage, incorporating specialized knowledge and observation instruments used in actual research into the storyline. By providing scientific integrity to the accessible medium of entertainment, these initiatives are considered to have had a significant effect on stimulating interest in Earth science among non-specialists. This presentation discusses the potential of multi-faceted approaches for meteorological outreach.

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