
Scientists Advance Cloud-seeding Capabilities with Nanotechnology

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A decades old idea, with today's innovation, might be the answer to help drought-stricken countries and to fight climate change.

Since the 1940s, scientists have studied ways to increase rainfall with the goal of increasing precipitation in arid and semi-arid climates. Today, that endeavor is making incredible leaps and bounds as scientists and engineers apply nanotechnology to improve the effectiveness of cloud seeding.

"The global water shortage has continuously intensified by rapid population growth and economic development around the world. Conventional water resources such as rivers, lakes, and groundwater have become very limited, which is driving scientists and engineers to look for alternative water resources," says Dr. Linda Zou, a professor of civil and environmental engineering at Khalifa University of Science and Technology.

Dr. Zou leads a groundbreaking research project using nanotechnology to develop cloud-seeding materials. Cloud seeding is a form of weather modification that mimics what naturally occurs in clouds but enhances the process by adding particles that can stimulate and accelerate the condensation process. However, Dr. Zou explains, "The cloud-seeding materials used today have been around for many decades. The information and techniques are out of date and their effectiveness is not well understood."

Cloud seeding has strict requirements. To be successful, scientists need the right air temperature, the right humidity, a surface that attracts water and keeps it, and then the correct size material to allow condensation to form on the particle.

"Through the advancement in nanotechnology and nanoscience, nowadays we are working to

design and engineer cloud-seeding materials with optimal properties to ensure water vapor condensation will occur effectively and maximize the rainfall achieved,” explains Dr. Zou.

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