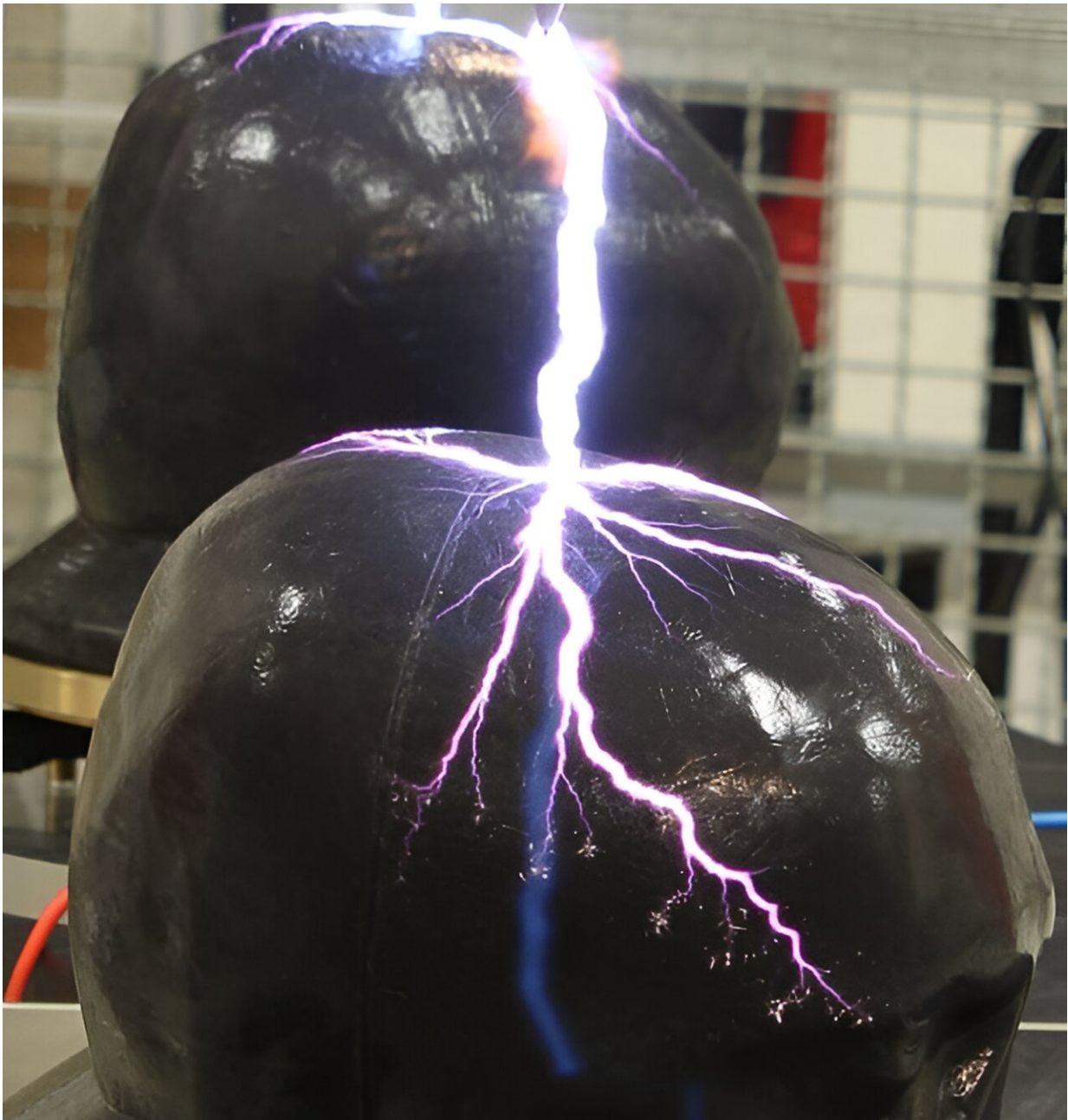


# Rainwater significantly reduces damage from lightning strikes to the head: Study

February 12 2024

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Long exposure of an experiment with a flash discharge on an artificial head.  
Credit: Technical University of Ilmenau

Research at the Technical University of Ilmenau has shown that rainwater on the scalp can reduce damage caused by direct lightning strikes to the head. When the scalp is wet, fewer impacts are recorded compared to dry scalp, and the wetness also reduces the electrical current to which the brain is exposed.

The scientists concluded that if a person wet with rain was struck directly in the head by lightning, they would have a significantly higher chance of survival. [The results](#) of this study have just been published in *Scientific Reports*.

Previous theoretical research has suggested that wet skin could reduce the [electrical current](#) to which a [human body](#) is exposed during a lightning strike. But there was no practical evidence for this assumption. Scientific experiments in the department have now provided evidence of this.

The scientists constructed human-like model heads and exposed them to high-energy electrical discharges that mimicked natural lightning. To recreate the [scalp](#), skull and [brain](#), the model heads had three layers. To recreate the electrical conductivity of human tissue, materials such as water, [sodium chloride](#), graphite and agarose were used.



The artificial heads that had been sprayed with artificial rainwater (picture left) had fewer perforations and less severely damaged areas than the dry ones (right). Credit: Technical University of Ilmenau

The scientists then carried out a comparative experiment: one head was exposed to the electrical discharges in a dry state while another had previously been sprayed with artificial rainwater. On the wet dummy head, there were fewer perforations and less severely damaged areas in the area around the [lightning strike](#) sites. In addition, the recorded current intensities to which the brain was exposed were lower when the head was wet than when it was dry, which is why it was exposed to much less stress.

From these results, the scientists concluded that the chance of survival of a person whose head is struck by lightning is significantly higher if the scalp is wet with rain. However, a lightning discharge poses great

dangers and a protected area should be sought as quickly as possible.

**More information:** René Machts et al, Rain may improve survival from direct lightning strikes to the human head, *Scientific Reports* (2024). [DOI: 10.1038/s41598-023-50563-w](https://doi.org/10.1038/s41598-023-50563-w)

Provided by Technical University of Ilmenau

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