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Humidity driven Freezing of Water

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Changes of phase of water are essential ingredients for climate and eventually life on Earth. In the present work, we show how freezing of supercooled water in an open container is triggered -exclusively- by humidity in air. We demonstrate that water freezing is triggered on the surface or water-air interface forming 2D single crystals on it prior to freezing of the bulk. Humidity triggers surface freezing as soon as it overpasses a defined value for a given temperature, generating a plurality of nucleation nodes. An evidence of simultaneous nucleation of surface ice crystals is also provided.
This, not really contradicting any fundamental principle of thermodynamics casts doubt on something that was usually assumed (intrinsic instability of supercooled water) and grants a conditioning role to humidity for triggering freezing that most likely will affect climatic models, systems for preventing ice accretion or to the way to understand interface catalytic reactions, etc.