Ice spike

Doug De La Matter
782 Tamarack Rd., Box 655
Barry’s Bay ON  K0J 1B0
email: dougdela@magma.ca
website: www.magma.ca/~dougdela

In the spring the surface ice on a lake can melt during the day and refreeze at night. If a thin layer freezes over a small pool of water, there may be a junction between crystals that leaves a small opening to the water below. As more freezing occurs underneath, the ice expands and forces liquid water up through the hole. The edges of this water freeze, helped by evaporative cooling, while the centre stays liquid. In a continuous process, a slender, hollow pipe is formed. Continued freezing in the pool below forces more water up the tube where it freezes around the rim and lengthens the pipe. If the source pool freezes solid, or if the top of the tube freezes shut, growth stops. In this picture, the spike is about 10 cm high and 0.8 cm in diameter. At the top of the spike, a few small droplets have frozen to the side of a thin needle. This is the Bally-Dorsey model of ice spike formation. Smaller ice spikes can be made by freezing distilled water in ice cube trays. Apparently, the probability of spike formation is reduced in the presence of dissolved salts.


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