

Re: Shuttle lift-off questions

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- *From:* kmuldrezw@xxxxxxxxxxxxx (Ken Muldrew)
 - *Date:* Fri, 07 Jul 2006 18:02:04 GMT
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"Randy Poe" <poespam-trap@xxxxxxxxxx> wrote:

mmeron@xxxxxxxxxxxxxxxxxxxxx wrote:

In article <e8lb1h\$8qk_001@xx>, jmfba@civ@xxxxxxx writes:

Does this have anything to do with Ken's comment about biology is all about surfaces? I'm still thinking about that one.

This one is more complex. But, in a nut shell, biology is about structures in liquid. and stuff is happening on the surfaces of the structures. But it could've been a different liquid than water.

Frostbite wouldn't be nearly as much of a problem if we weren't water based. The problem is that when cells freeze, they burst their membranes and die. What if freezing was non-destructive, and things could just thaw back out again?

Freezing injury is almost completely due to high salt concentrations that result when the ice crystal excludes dissolved solutes into the remaining unfrozen fraction. Since solute exclusion is a general phenomenon associated with crystallization, I don't think we can attribute frostbite to the anomalous properties of water. Freezing damage is pretty much all due to desiccation.

There are organisms which can survive freezing and thawing. They must use some such strategy. Viruses don't have any water. But bacteria do... how do they survive? Or do they?

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Most bacteria can survive some types of freezing and thawing without any particular strategy (other than a cell wall, perhaps). Larger organisms need to do things like prevent ice crystal nucleation, inhibit ice crystal growth, buffer the high salt concentrations, stabilize membranes against desiccation, and other strategies.

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