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These good vibrations could shake up our lives

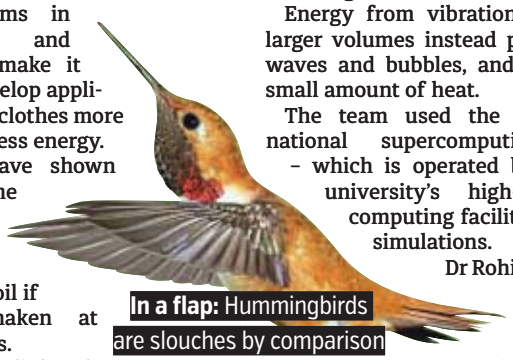
by STEPHEN DEAL

ULTRA-FAST vibrations a million times faster than the flapping of a hummingbird's wings can be used to heat tiny amounts of liquid, experts have found.

They believe the discovery could have a range of engineering applications, such as preventing the build-up of ice on aeroplanes and wind turbines.

They could also be used to enhance cooling systems in smartphones and laptops, and make it possible to develop appliances that dry clothes more quickly using less energy.

Scientists have shown for the first time that tiny quantities of liquid can be brought to a boil if they are shaken at extreme speeds.



In a flap: Hummingbirds are slouches by comparison

A team from Edinburgh University made the discovery using computer simulations.

Liquid layers one thousand times thinner than a human hair can be boiled using extremely rapid vibrations – said by the academics to be a million times faster than the flapping of a hummingbird's wings.

The motion of the vibrating surface under the fluid is converted into heat as liquid molecules move and collide with each other, the team says.

It is only possible to use vibrations to boil extremely small quantities of liquid – contained within a few billionths of a metre above the vibrating surface, researchers say.

Energy from vibrations applied to larger volumes instead produces tiny waves and bubbles, and only a very small amount of heat.

The team used the ARCHER UK national supercomputing service – which is operated by EPCC, the university's high-performance computing facility – to run its simulations.

Dr Rohit Pillai, of the university's school of engineering, who led the study, said: 'Exploiting this new science of vibrations at the smallest scales could literally shake things up in our everyday lives. The advent of nanotechnology means this discovery can underpin novel engineering devices of the future.'

The study is published in the journal Physical Review Letters.