Oh, what a feeling - dancing on the ceiling!

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Electron microscope image of a fly foot.

Ever wondered how flies are able to walk on the ceiling without falling off? Scientists at the Max Planck Institute in Stuttgart (Germany) are investigating this James Bond-style ability of insects to hang upside down from a ceiling. In the future such knowledge could lead to the design of tiny machines that mimic this phenomenon of nature.

The team led by Stanislav Gorb used optical sensors to measure the forces applied by each leg of a fly whilst walking freely on a smooth ceiling. They found that the best attachment force occurred when at least one leg from each side of the fly's body was in contact with the surface. These principles were then proven using artificial polymer tape to simulate the adhesive pads found on the feet of insects.

"Walking on a ceiling is very different from normal walking because the

gravity tends to pull an inverted insect away instead of pressing it to the surface", explains Dr Gorb. "Our results, in combination with the knowledge on the microstructure of pads, provide important inspiration for mimicking locomotion of wall and ceiling walking machines, which use micropatterned polymer feet for generating adhesion".

Dr Gorb will be presenting his results at the Annual Meeting of the Society for Experimental Biology on Wednesday 5th April.

Source: Society for Experimental Biology