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# Holy Batcape! Superhero-like smartclothes now a step closer

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*Christian Bale as the caped crusader Batman*

Batman's cape may no longer be a work of fiction thanks to Irish mathematicians. Researchers in NUI Galway have worked out a groundbreaking new formula which could assist in developing artificial muscles, soft robotics and energy harvesters which generate electricity.

The research could also extend to 'smart clothes', to which Batman is privy.

"If you can remember the scene in *Batman Begins* where this huge bat cape emerges from a tiny folded piece of material, that's the kind of technology which is being developed currently in some labs around the world, especially in Harvard University and in China," said Professor Michel Destrade of NUI Galway. "It's the electric voltage that allows these special membranes to expand," he added.

The elastic material or dielectric membranes expand when a voltage is applied to it, the more voltage applied and the faster it expands. However if too much voltage is applied, the material malfunctions.

"Until now it was not fully understood how much voltage these membranes could sustain. If they thin out too much when they stretch with the voltage, it can lead to a catastrophic breakdown. We hope our mathematical formula will help advance science in this area," said Prof Destrade.