

Technology

Remote-controlled cockroach swarm can now breathe underwater

Tiny 3D-printed diving suits allow cockroaches to walk underwater for up to 3 hours with no ill effects, which could enable a cyborg insect swarm to explore disaster zones and perhaps even Mars

By [Matthew Sparkes](#)

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▲ **A cyborg cockroach with a suit for breathing underwater**
NTU Singapore

Swarms of cyborg insects controlled remotely via electrical implants can now operate underwater, thanks to tiny diving suits supplying them with oxygen – which could one day enable them to explore Mars.

[Hirotaka Sato](#) <https://dr.ntu.edu.sg/entities/person/Hirotaka-Sato> at Nanyang Technological University in Singapore and his colleagues first demonstrated in 2021 that Madagascar hissing cockroaches (*Gromphadorhina portentosa*) could be remotely controlled with [electrodes](#) </article/2280057-cyborg-cockroach-with-camera-backpack-can-be-steered-remotely/> embedded in sensory organs known as cerci. In 2024, they demonstrated that a [swarm of 20 of these cyborg insects](#) </article/2424745-watch-a-swarm-of-cyborg-cockroaches-controlled-by-computers/> could coordinate.