

Nanotech research yields bouncing liquid metal marbles (w/ video)

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Coating liquid metal droplets in a nanoparticle mix creates an extra strong non-stick conductive material that retains its shape even under high impact, Australian research has found.

The breakthrough paves the way for new developments in soft electronics, said lead author of the research, Dr Vijay Sivan from RMIT's Electrical and Computer Engineering.

"It's a bit premature at this stage but in future we can see it may have a lot of applications," he said, including extendable antennas, and stretchable and reconfigurable wires.

The research team's paper, published in the journal [Advanced Functional Materials](#), described how droplets of [galinstan](#) liquid metal were coated with powdered insulators including Teflon and silica and semiconductors such as [titanium dioxide](#) and tungsten trioxide, as well as conducting carbon nanotubes.

Once given their nanoparticle coating, the liquid metal marbles "can be split and merged, can be suspended on water, and are even stable when moving under the [force of gravity](#) and impacting a flat [solid surface](#)," with semiconducting properties at their surface, the researchers said in their paper.

"This new element thus represents a significant platform for the advancement of research into soft electronics," the paper said.

A before-and-after video created by the researchers shows how, without the coating, the [liquid metal](#) marbles lose shape and stick when dropped onto a hard surface. The coated [liquid droplets](#), however, retain their shape and bounce like a soft ball.

Associate Professor Patrick Kluth from the Australian National University's Department of Electronic Materials Engineering, said the researchers had produced an interesting finding.

"The applications and limitations for practical use for systems like this can be: reproducibility of the fabrication process, scalability and cost of the fabrication (can they be manufactured in sufficient quantities at reasonable cost), and long term stability under application conditions (how long do they last in applications). Such factors will certainly determine the industrial success of an innovation such as this," said Dr Kluth, who was not involved in the RMIT research.

More information: [onlinelibrary.wiley.com/doi/10 ...
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