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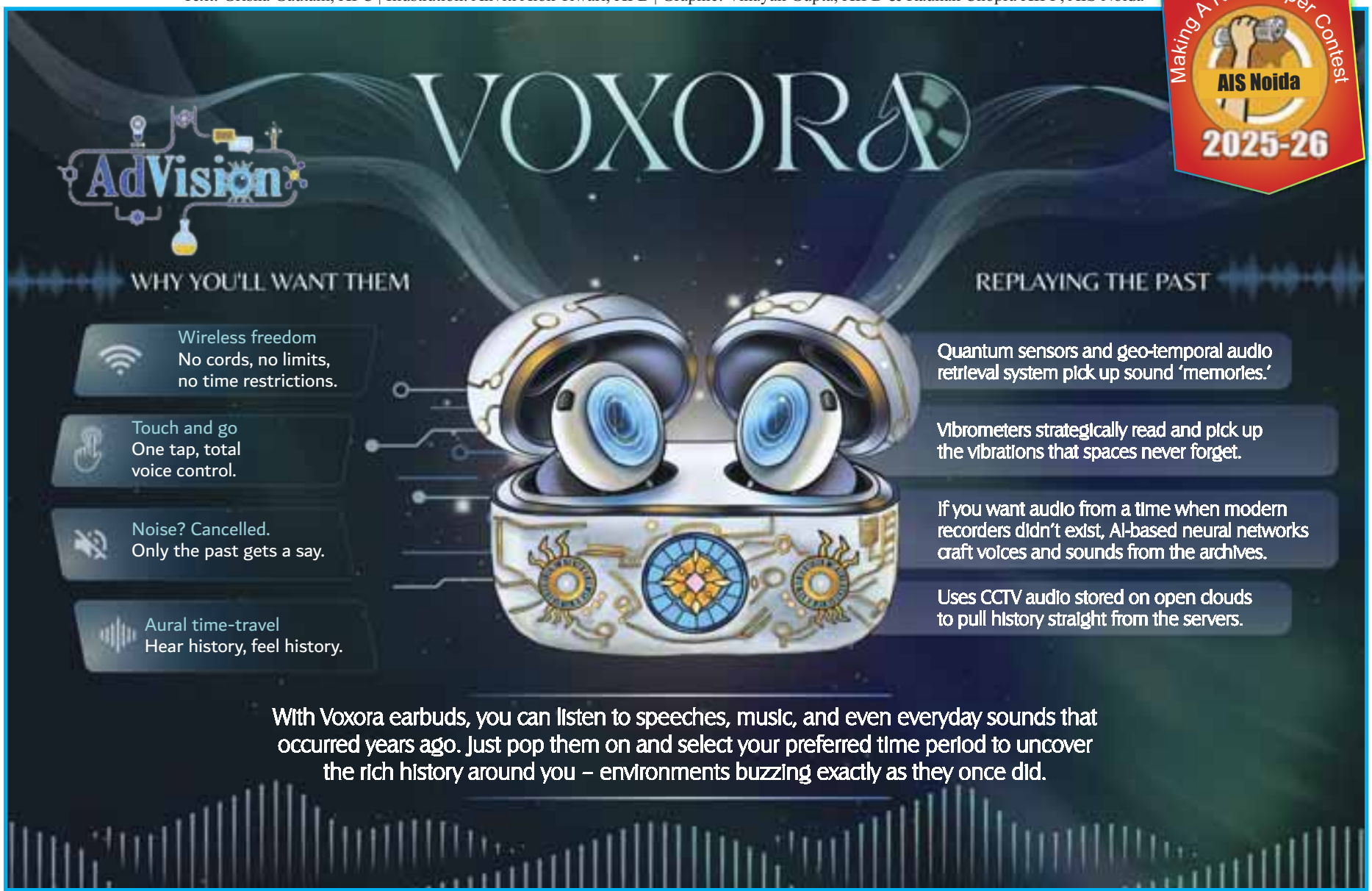

Microscopic, but mighty

Tardigrades: 'Water Bears' That Can Beat Almost All Extremes

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If nature ever hosted a survival reality show, tardigrades would walk in (very slowly) and win without even trying. These microscopic wonders, fondly called 'water bears', pack more survival power into one millimetre than most action heroes pack into an entire movie. Hidden in moss, mud, glaciers, and maybe somewhere in your forgotten plant pot, they prove that the universe has a wonderful sense of humour when designing life.

Tiny gummy bears?

Tardigrades are chubby, eight-legged creatures that look a bit like gummy bears. The 'water bears' don't really care whether there's water around or not. They can handle almost everything: boiling, freezing, drying, frying… basically everything. German zoologist Johann August Ephraim Goeze discovered them in 1773. A few years later, biologist Lazzaro Spallanzani named them Tardigrada, meaning 'slow steppers', because they walk like they are permanently late and yet too lazy to hurry.

Superpower: cryptobiosis

Cryptobiosis is the tardigrade's ultimate "Nope, not dealing with this today" mode. When life gets tough - too hot, too cold, too salty, too dry, or low on oxygen - they shut down and enter something like airplane mode, where their metabolic activity drops to nearly zero (around 0.01%). They curl up like a tiny cinnamon roll and can survive like this for decades. This state is called a 'tun', and it makes them resistant to heat, cold, radiation, pressure, vacuum; imagine a vacation where you just laze around doing nothing. Types of cryptobiosis include: Anhydrobiosis (when things get dry enough to make a desert jealous); Cryobiosis (when it gets so cold that even Elsa would be bothered); Osmobiosis (when salt levels go high enough to rival the Dead Sea); Anoxybiosis (when oxygen decides to walk out).

Supreme survival skills

Tardigrades live in oceans, mountaintops, rainforests, the Arctic, and backyard moss. Basically, if there's even a hint of moisture, a tardigrade is probably hanging out there. And yes, they can survive in outer space too - actual, airless, cosmic-radiation-filled outer space. In 2007, scientists launched some tardigrades into space, probably expecting dramatic deaths. Instead, many of them came back like, "That was fun. What's next?" Their secret? Unique proteins, incredible DNA repair, and pure stubbornness.

Other abilities

Tardigrades can survive being boiled, frozen, crushed, dehydrated, and blasted with radiation. They're basically nature's version of an unskippable advertisement - no matter what you do, they're still there. Tiny but unstoppable, tardigrades are the universe's reminder that some of the strongest things could come in small packages. GT