

# Arrowhead Receives Patent on Spintronic Technology for Use in Next-Generation Semiconductor Devices

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Arrowhead Research Corporation announced today the U.S. Patent Office issued U.S. patent 6,879,012, Giant Planar Hall Effect in Epitaxial Ferromagnetic Semiconductor Devices. The patent is exclusively licensed to Nanotechnica, Inc., Arrowhead's majority-owned subsidiary, by the California Institute of Technology.

The patent covers ferromagnetic semiconductor-based methods, devices, and compositions. The technology enables measurements of magnetic spins and enhanced magnetic switching effects, which could play a key role in development of future semiconductor devices based on 'spintronics.'

Traditional semiconductor devices operate by storing information as charge - an electron's state represents 0 or 1. In contrast, spintronics taps into the spin of electrons to store or transmit information, which enables next-generation devices for memory, disk storage, magnetic sensors, and quantum computers to be smaller, more powerful, and have longer lives than today's products.

"This patent covers foundational technology for what we believe will be the next-generation of semiconductor devices," said R. Bruce Stewart, President of Arrowhead. "This patent further strengthens our diversified portfolio of patents in the nanotechnology space. Arrowhead and its subsidiaries now control 36 issued U.S. patents and have licensed over 240 U.S. and international patents and patent applications."

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