

# Magnetic Nanopillars Fabricated Using Electron Beam Lithography

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**GOAL**

To fabricate  $\text{CoFe}_2\text{O}_4$  nanopillars with perpendicular magnetic anisotropy in order to produce magnetic quantum cellular automata for possible use in spintronic logic.

**KEY ACCOMPLISHMENTS**

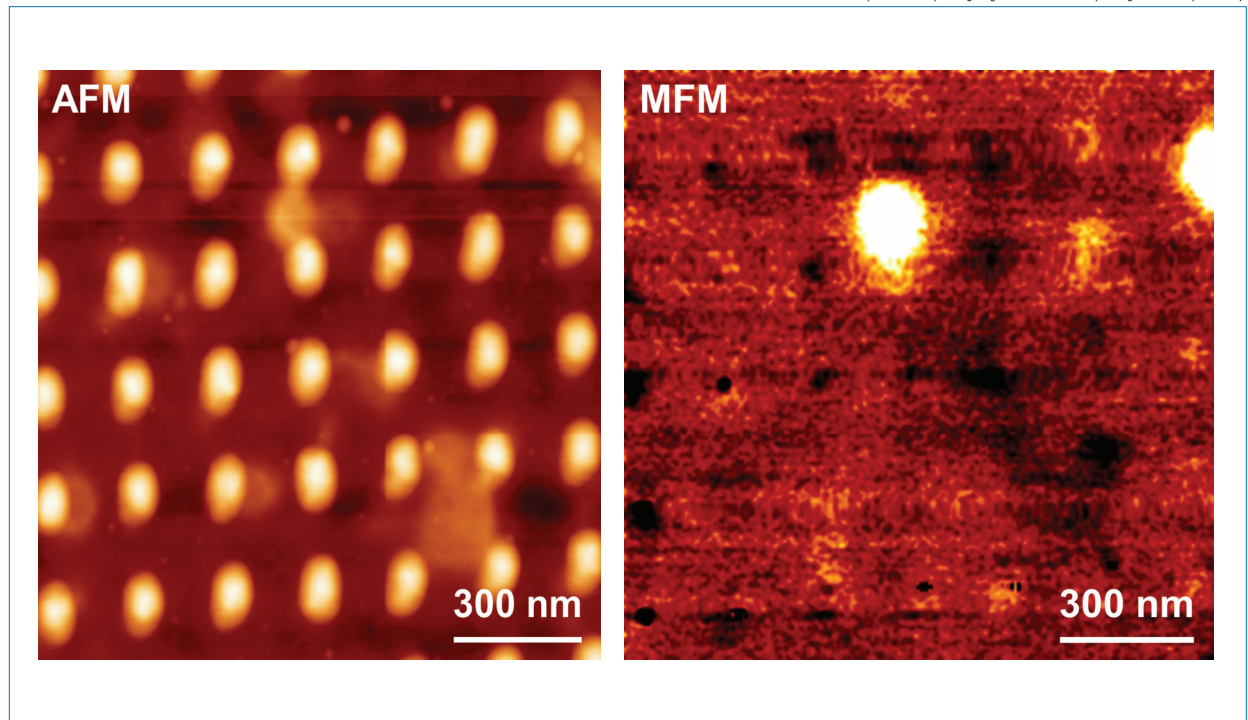
Fabricated the smallest reported  $\text{CoFe}_2\text{O}_4$  nanopillars using electron beam lithography.

Characterized the arrays with magnetic force microscopy, revealing dipole interactions between the pillars.

**KEY NANOFAB PROCESS**

Electron beam lithography and reactive ion etching to pattern and etch uniform arrays of magnetic nanopillars.

*Atomic force microscope and corresponding magnetic force microscope images of a nanopillar array.*



**REFERENCE**

The promise of nanomagnetism and spintronics for future logic and universal memory, S. A. Wolf, J. Lu, M. R. Stan, E. Chen, and D. M. Trager, *Proceedings of the IEEE* **98**, 2155-2168 (2010).