

# Nanodots Breakthrough May Lead To 'A Library On One Chip'

April 28 2010, by Matt Shipman

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A researcher at North Carolina State University has developed a computer chip that can store an unprecedented amount of data - enough to hold an entire library's worth of information on a single chip. The new chip stems from a breakthrough in the use of nanodots, or nanoscale magnets, and represents a significant advance in computer-memory technology.

"We have created magnetic nanodots that store one bit of information on each nanodot, allowing us to store over one billion pages of information in a chip that is one square inch," says Dr. Jay Narayan, the John C. Fan Distinguished Chair Professor of Materials Science and Engineering at NC State and author of the research.

The breakthrough is that these nanodots are made of single, defect-free crystals, creating magnetic sensors that are integrated directly into a silicon [electronic chip](#). These nanodots, which can be made uniformly as small as six [nanometers](#) in diameter, are all precisely oriented in the same way - allowing programmers to reliably read and write data to the chips.

The chips themselves can be manufactured cost-effectively, but the next step is to develop magnetic packaging that will enable users to take advantage of the chips - using something, such as [laser technology](#), that can effectively interact with the nanodots.

The research, which was funded by the National Science Foundation,

was presented as an invited talk April 7 at the 2011 Materials Research Society Spring Meeting in San Francisco.

**More information:** “Self Assembly of epitaxial magnetic nanostructures”, Author: J. Narayan, North Carolina State University, Presented: April 7, 2010, 2011 MRS Spring Meeting, San Francisco.

Provided by North Carolina State University

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