

Digital memory enters a new phase

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With the recent explosion in the popularity of digital music, digital photography and even digital video, the demand for faster, higher-capacity and cheaper computer memory has never been greater. Writing in the April issue of *Nature Materials* (DOI: 10.1038/nmat1350), Martijn Lankhorst (Philips Research Laboratories, Eindhoven, The Netherlands) and colleagues describe a new memory device that could meet this ever-growing need.

The authors' memory devices are based on the use of so-called phase-change materials similar to those used to make rewritable DVDs. These materials can be switched between two distinct structural states, or phases -- amorphous (atomically disordered) or crystalline (atomically ordered), each with different physical properties -- which can be used to record binary information. Unlike rewritable DVDs, however, the authors' devices allow this information to be recorded and read by electronic rather than optical means.

Although the idea of electronically operated phase-change memories is not new, recent advances in the development of the materials on which they are based has driven renewed commercial interest in them as a replacement to the conventional memory used in portable applications such as mobile phones and music players. In their latest work, the team not only report a new phase-change material but an entirely new device structure, allowing for substantial improvements in the speed, size, power consumption and cost of these memories.

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