

Cover Picture

Yi Luo, C. Patrick Collier, Jan O. Jeppesen, Kent A. Nielsen, Erica Delonno, Greg Ho, Julie Perkins, Hsian-Rong Tseng, Tohru Yamamoto, J. Fraser Stoddart, and James R. Heath

The cover picture shows part of a twodimensional crossbar circuit in which amphiphilic bistable [2]rotaxane molecules are oriented and clustered in the form of a monolayer between polysilicon wires (yellow) and top electrodes (gray and white) of titanium topped by aluminum. For 2D circuit measurements, a relay-switching matrix can be used to achieve independent control over every wire when operating a device as a rewritable 64-bit random access memory circuit or as an XOR logic gate, for example. Junctions can be opened or closed by splitting the address voltage across the top and bottom wires that define the junction, while all other wires are held at ground. After some strings of bits have been configured into the memory, the entire memory is read out by applying a small voltage to the top electrode and grounding the bottom wire through a current preamplifier, while again, all other wires are grounded.

