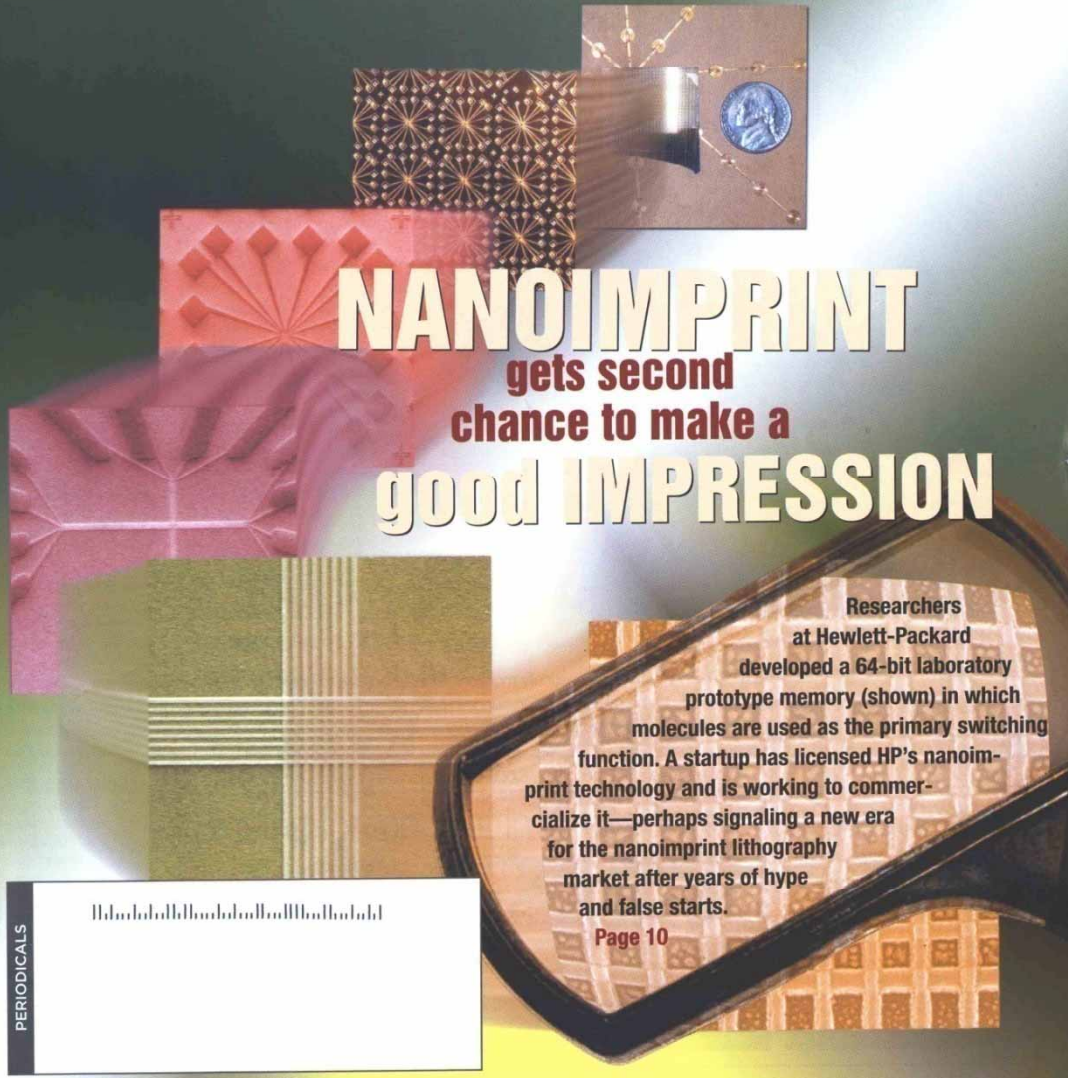


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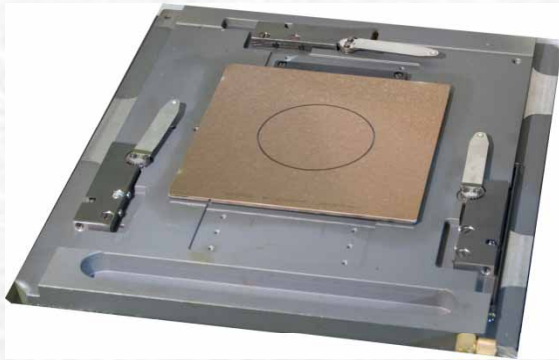
NANOIMPRINT gets second chance to make a good IMPRESSION

Researchers at Hewlett-Packard developed a 64-bit laboratory prototype memory (shown) in which molecules are used as the primary switching function. A startup has licensed HP's nanoimprint technology and is working to commercialize it—perhaps signaling a new era for the nanoimprint lithography market after years of hype and false starts.

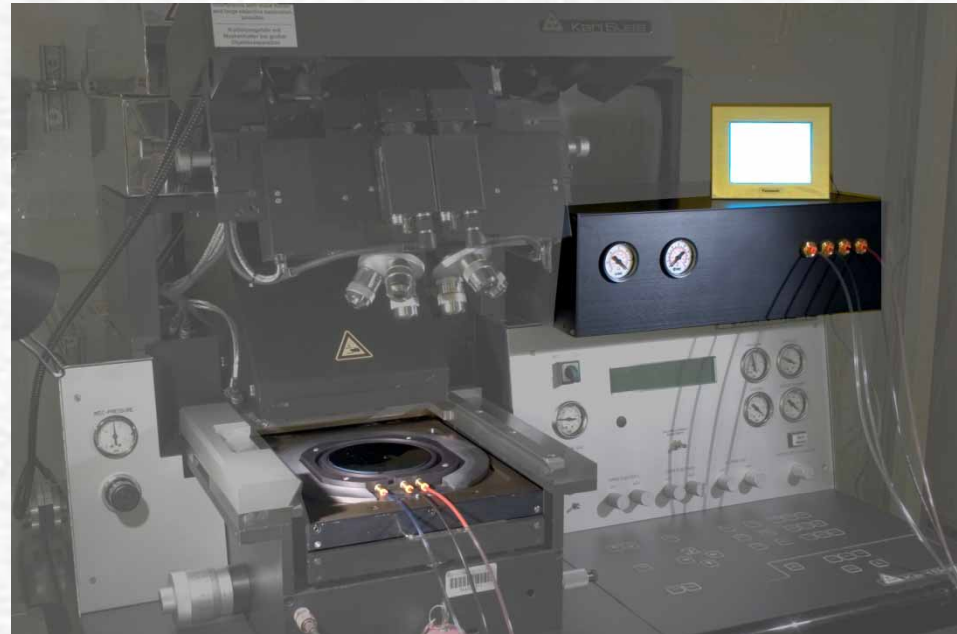
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PERIODICALS

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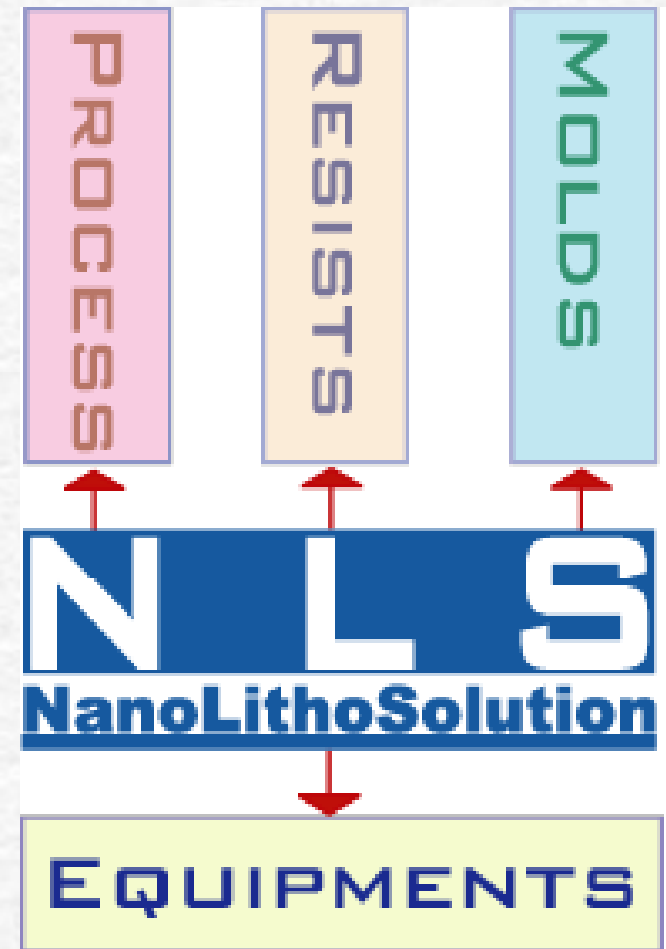


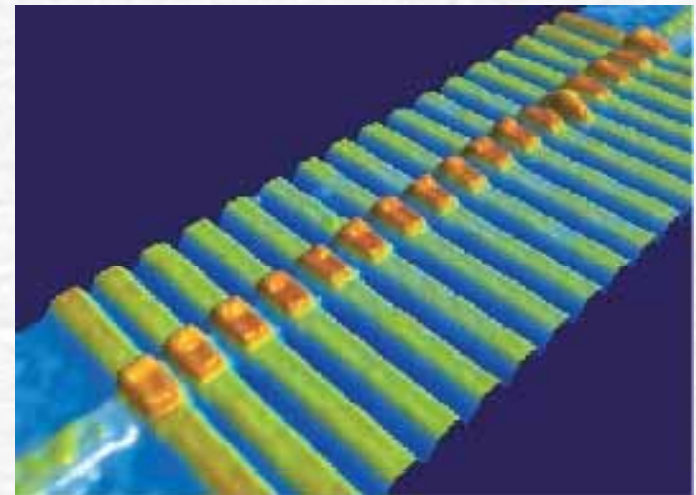
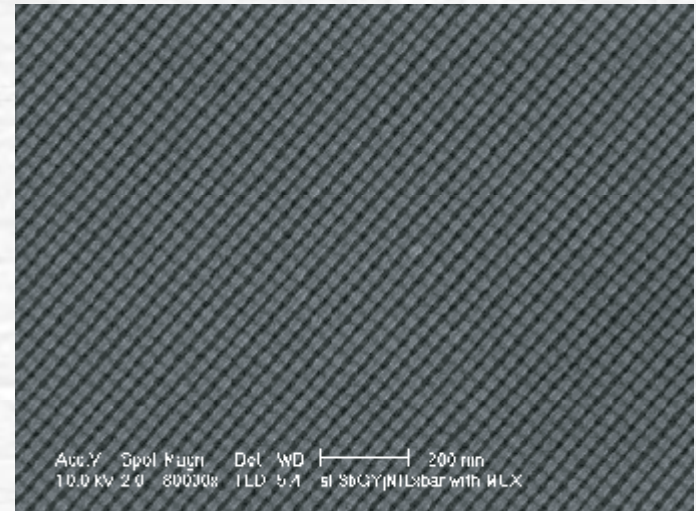
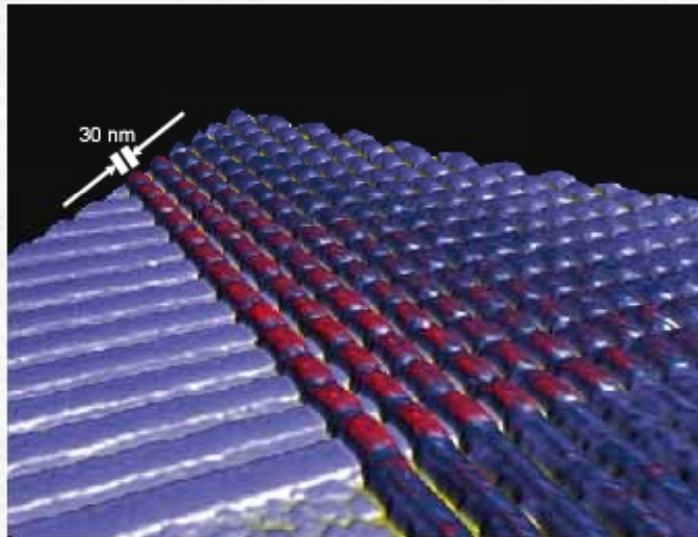
Auto Release™
Mold Design*

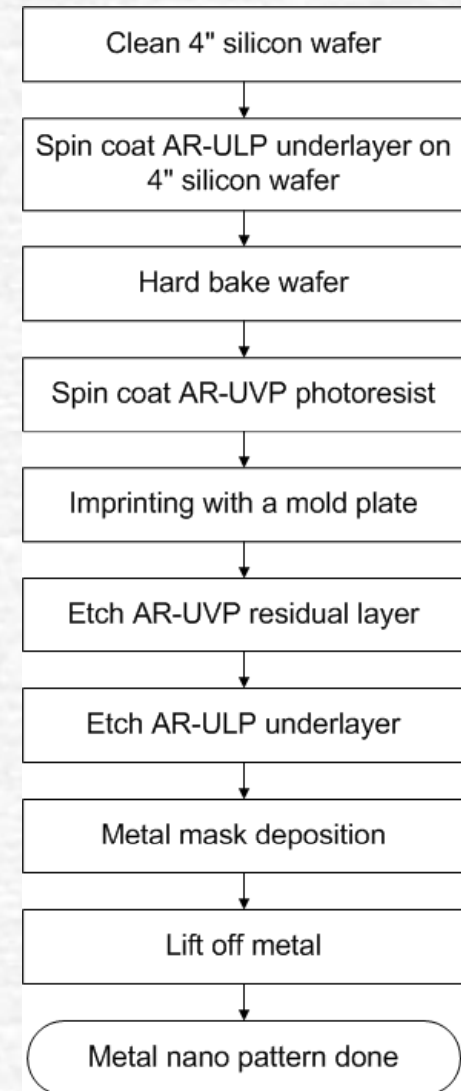
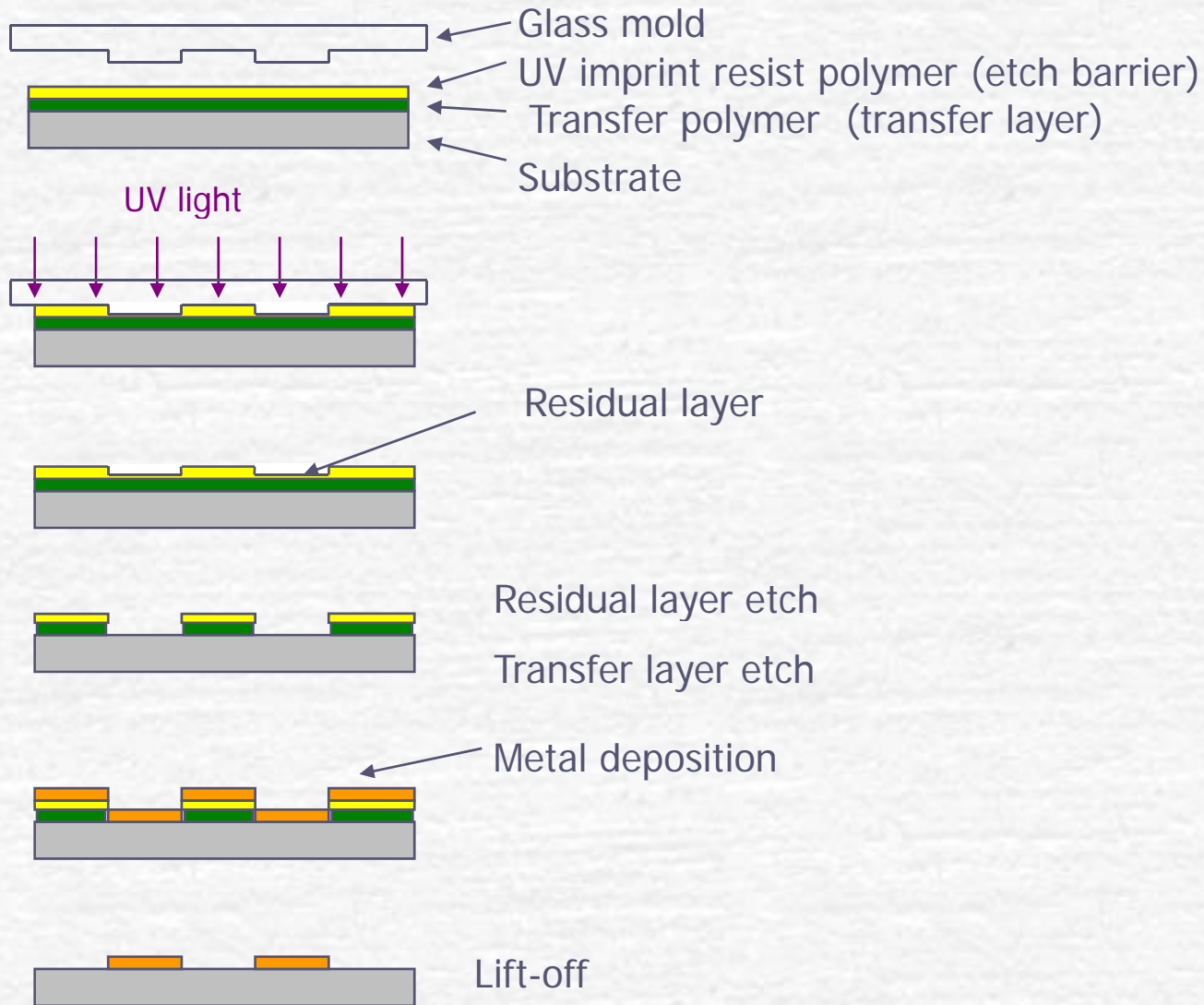
Accurate Align NanoImprint System*

* Multiple patents and pending patents

- Robust process: proven through many of the world leading research works
- Precision alignment: submicron alignment
- Easy to use: a person familiar with semiconductor process can be trained with in a few hours.
- No disruption with existing process: No extra equipment footprint required.







Equipment and Materials

AR-NIM-100 nanoimprint module

AR-IMC-100 nanoimprint controller

SUSS MicroTec MA-6 optical aligner (other aligners will be supported soon)

RIE etcher (Oxford Plasmalab 80+)

E-beam evaporator

Acid wet bench

Spin-coater (4" wafer + 5" plate)

Hot plate (5" plate)

Tweezers

0.2 μm filters (disposable syringe type)

Syringes

AR-UVP-100 UV polymer

AR-ULP-100 under layer polymer

Sulfuric acid

Hydrogen peroxide

Acetone

Methanol

Isopropanol

DI water

References

1. W. Wu, E. Kim, E. Ponizovskaya, Y. Liu, Z. Yu, N. Fang, Y. R. Shen², A. M. Bratkovsky, W. Tong, C. Sun, X. Zhang, S.-Y. Wang and R. S. Williams "Optical Metamaterials at Near and Mid IR Range Fabricated by Nanoimprint Lithography" *Applied Physics a-Materials Science & Processing* online and in print (2007)
2. W. Wu, Z. N. Yu, S. Y. Wang, R. S. Williams, Y. M. Liu, C. Sun, X. Zhang, E. Kim, Y. R. Shen and N. X. Fang "Midinfrared metamaterials fabricated by nanoimprint lithography" *Applied Physics Letters* 90 (2007)
3. Z. N. Yu, W. Wu, G. Y. Jung, D. L. Olynick, J. Straznicky, X. M. Li, Z. Y. Li, W. M. Tong, J. A. Liddle, S. Y. Wang and R. S. Williams "Fabrication of 30 nm pitch imprint moulds by frequency doubling for nanowire arrays" *Nanotechnology* 17, 4956-4961 (2006)
4. C. Stuart, Q. F. Xu, R. J. Tseng, Y. Yang, H. T. Hahn, Y. Chen, W. Wu and R. S. Williams "Nanofabrication module integrated with optical aligner" *Journal of Vacuum Science & Technology B* 24, 539-542 (2006)
5. G.-Y. Jung, E. Johnston-Halperin, W. Wu, Z. Yu, S.-Y. Wang, W. M. Tong, Z. Li, J. E. Green, B. A. Sheriff, A. Boukai, Y. Bunimovich, J. R. Heath and R. S. Williams "Circuit fabrication at 17 nm half-pitch by nanoimprint lithography" *Nano Letters* 6, 351-354 (2006)
6. J. Gao, C. Picciotto, W. Wu and W. M. Tong "From nanoscale displacement sensing and estimation to nanoscale alignment" *Journal of Vacuum Science & Technology B* 24, 3094-3100 (2006)
7. W. Wu, G. Y. Jung, D. L. Olynick, J. Straznicky, Z. Li, X. Li, D. Ohlberg, Y. Chen, S. Y. Wang, W. M. Tong and R. S. Williams "One kilobit Cross-bar Molecular Memory Circuits at 30 nm Half Pitch Fabricated by Nanoimprint Lithography" *Applied Physics a-Materials Science & Processing* 80, 1173-1178 (2005)
8. H. X. Ge, W. Wu, Z. Y. Li, G. Y. Jung, D. Olynick, Y. F. Chen, J. A. Liddle, S. Y. Wang and R. S. Williams "Cross-linked polymer replica of a nanoimprint mold at 30 nm half-pitch" *Nano Letters* 5, 179-182 (2005)
9. G.-Y. Jung, Z. Li, W. Wu, S. Ganapathiappan, X. Li, D. L. Olynick, S. Y. Wang, W. M. Tong and R. S. Williams "Improved pattern transfer in nanoimprint lithography at 30 nm half-pitch by substrate-surface functionalization" *Langmuir* 21, 6127-6130 (2005)
10. W. M. Tong, S. D. Hector, G.-Y. Jung, W. Wu, J. Ellenson, K. Kramer, T. Hostetler, S. K. Richards and R. S. Williams "Nanoimprint lithography: The path toward high tech, low cost devices" *Progress in Biomedical Optics and Imaging - Proceedings of SPIE* 5751, 46-55 (2005)
11. G.-Y. Jung, Z. Li, W. Wu, Y. Chen, D. L. Olynick, S.-Y. Wang, W. M. Tong and R. S. Williams "Vapor-phase self-assembled monolayer for improved mold release in nanoimprint lithography" *Langmuir* 21, 1158-1161 (2005)
12. G. Y. Jung, W. Wu, S. Ganapathiappan, D. A. A. Ohlberg, M. S. Islam, X. Li, D. L. Olynick, H. Lee, Y. Chen, S. Y. Wang, W. M. Tong and R. S. Williams "Issues on nanoimprint lithography with a single-layer resist structure" *Applied Physics a-Materials Science & Processing* 81, 1331-1335 (2005)
13. G. Y. Jung, W. Wu, H. Lee, S. Y. Wang, W. M. Tong and R. S. Williams "Fabrication of multi-bit crossbar circuits at sub-50 nm half-pitch by using UV-based nanoimprint lithography" *Journal of Photopolymer Science and Technology* 18, 565-570 (2005)
14. G. Y. Jung, W. Wu, Z. Li, S. Y. Wang, W. M. Tong and R. S. Williams "Surface engineering for resolution enhancement in nanoimprint lithography" *Progress in Biomedical Optics and Imaging - Proceedings of SPIE* 5751, 952-956 (2005)
15. G. Y. Jung, W. Wu, Z. Li, S. Y. Wang, W. M. Tong and R. Stanley Williams "Resolution enhancement in nanoimprinting by surface energy engineering" 2005 NSTI Nanotechnology Conference and Trade Show - NSTI Nanotech 2005 Technical Proceedings 251-254 (2005)
16. G. Y. Jung, S. Ganapathiappan, X. Li, D. A. A. Ohlberg, D. L. Olynick, Y. Chen, W. M. Tong and R. S. Williams "Fabrication of molecular-electronic circuits by nanoimprint lithography at low temperatures and pressures" *Applied Physics a-Materials Science & Processing* 78, 1169-1173 (2004)
17. G. Y. Jung, S. Ganapathiappan, D. A. A. Ohlberg, D. L. Olynick, Y. Chen, W. M. Tong and R. S. Williams "Fabrication of a 34 x 34 crossbar structure at 50 nm half-pitch by UV-based nanoimprint lithography" *Nano Letters* 4, 1225-1229 (2004)
18. Y. Chen, D. A. A. Ohlberg, X. M. Li, D. R. Stewart, R. S. Williams, J. O. Jeppesen, K. A. Nielsen, J. F. Stoddart, D. L. Olynick and E. Anderson

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