

Prof. Neil Gershenfeld

Director
The Center for Bits and Atoms
Massachusetts Institute of Technology

Room E15-411
20 Ames Street
Cambridge, MA 02139

gersh@cba.mit.edu
phone: (617) 253-7680
fax: (617) 253-7035

<http://ng.cba.mit.edu>

EMPLOYMENT

Professor, MIT (7/92-)

Junior Fellow, Harvard University Society of Fellows (9/89-7/92)

Technician, Bell Labs (9/81-9/83; 6-12/84)

Visiting Scientist, San Francisco Laser Center (9/83-6/84)

Summer Fellow, Woods Hole Oceanographic Institution (6-9/80; 7-8/83)

EDUCATION

Graduate (1/85-1/90, MA, Ph.D.)

Department of Applied and Engineering Physics, Cornell University, Ithaca, NY. Prof. Watt Webb, advisor, working with Profs. David Mermin, John Guckenheimer, Robert Pohl, and Jim Sethna. IBM Graduate Fellowship.

Undergraduate (9/77-6/81, BA)

Swarthmore College, Swarthmore, PA. Physics major, Engineering minor; graduated with High Honors, Phi Beta Kappa, and Sigma Xi; co-captain of the swim team.

Secondary (9/74-6/77)

Plymouth Whitemarsh High School, Plymouth Meeting, PA. Years also spent in Kingston, Jamaica and Oxford, England.

RECOGNITION

Fellow, American Physical Society

Honorary doctorates from Swarthmore College, Strathclyde University, and the University of Antwerp

Top 100 public intellectuals, Prospect/Foreign Policy

50 leaders in science and technology, Scientific American

40 Modern-Day Leonardos, Museum of Science and Industry

25 Makers, Popular Mechanics

Principal Voice, CNN/Time/Fortune

Brain Scan, The Economist

National Academy of Sciences Great Hall

Mario Pani Prize

BOOKS

- (6) *Designing Reality*, Neil Gershenfeld, Alan Gershenfeld, and Joel Cutcher-Gershenfeld, Basic Books (2017).
- (5) *Fab: The Coming Revolution On Your Desktop – from Personal Computers To Personal Fabrication*, Neil Gershenfeld, Basic Books (2005). (BusinessWeek Best of 2005)
- (4) *The Physics of Information Technology*, Neil Gershenfeld, Cambridge University Press (2000).
- (3) *When Things Start to Think*, Neil Gershenfeld, Henry Holt and Company (1999). (Amazon top 10)
- (2) *The Nature of Mathematical Modeling*, Neil Gershenfeld, Cambridge University Press (1999).
- (1) *Time Series Prediction: Forecasting the Future and Understanding the Past*, Andreas S. Weigend and Neil A. Gershenfeld eds., Santa Fe Institute Studies in the Sciences of Complexity, Addison–Wesley (1993).

ARTICLES

- (81) *Digital Fabrication and the Future of Work*, J. Cutcher-Gershenfeld, A. Gershenfeld, and N. Gershenfeld, Perspectives on Work, Labor and Employment Relations Association, pp. 8-13 (2018).
- (80) *Hierarchical assembly of a self-replicating spacecraft*, W. Langford, A. Ghassaei, B. Jenett, and N. Gershenfeld, Aerospace Conference, 2017 IEEE, pp. 1-10 (2017).
- (79) *Cardboard Machine Kit: Modules for the Rapid Prototyping of Rapid Prototyping Machines*, N. Peek, J. Coleman, I. Moyer, and N. Gershenfeld, Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems, pp. 3657-3668. ACM (2017).
- (78) *Digital morphing wing: active wing shaping concept using composite lattice-based cellular structures* B. Jenett, S. Calisch, D. Cellucci, N. Cramer, N. Gershenfeld, S. Swei, and K.C. Cheung, *Soft Robotics* (4), pp. 33-48 (2017).
- (77) *Progress in fabrication of waveguide spatial light modulators via femtosecond laser micromachining* N. Savidis, S. Jolly, B. Datta, M. Moebius, T. Karydis, E. Mazur, N. Gershenfeld, and V.M. Bove, Proc. SPIE 10115, Advanced Fabrication Technologies for Micro/Nano Optics and Photonics X, 101150R, doi: 10.1117/12.2250596 (2017).
- (76) *Automated Assembly of Electronic Digital Materials*, W. Langford, A. Ghassaei, and N. Gershenfeld, ASME 2016 11th International Manufacturing Science and Engineering Conference, pp. V002T01A013-V002T01A013. American Society of Mechanical Engineers (2016).
- (75) *Macrofabrication with Digital Materials: Robotic Assembly*, N. Gershenfeld, M. Carney, B. Jenett, S. Calisch, S. Wilson, S., *Architectural Design* (85), pp. 122-127 (2015).

- (74) *As Objects Go Online: The Promise (and Pitfalls) of the Internet of Things*, Neil Gershenfeld and JP Vasseur, *Foreign Affairs* (93), pp. 60-67 (2014).
- (73) *Reversibly Assembled Cellular Composite Materials*, Kenneth C. Cheung and Neil Gershenfeld, *Science* (341), pp. 1219-1221 (2013).
- (72) *The Milli-Motein: A Self-Folding Chain of Programmable Matter with a One Centimeter Module Pitch*, Ara N. Knaian, Kenneth C. Cheung, Maxim B. Lobovsky, Asa J. Oines, Peter Schmidt-Nielsen, and Neil A. Gershenfeld, *IEEE/RSJ International Conference on Intelligent Robots and Systems* (2012).
- (71) *How to Make Almost Anything: The Digital Fabrication Revolution*, Neil Gershenfeld, *Foreign Affairs* (91), pp. 43-57 (2012).
- (70) *Aligning the Representation and Reality of Computation with Asynchronous Logic Automata*, Neil Gershenfeld, *Computing* (93), pp. 91-102 (2011).
- (69) *Cryptography with Asynchronous Logic Automata*, Peter Schmidt-Nielsen, Kailiang Chen, Jonathan Bachrach, Scott Greenwald, Forrest Green, and Neil Gershenfeld, *Quisquater Festschrift*, LNCS 6805, D. Naccache (Ed.), pp. 355-363 (2011).
- (68) Review, *Physics of the Future: How Science Will Shape Human Destiny and Our Daily Lives by the Year 2100*, N. Gershenfeld, *Physics Today* (64), p. 56 (2011).
- (67) *Inertial Measurement With Trapped Particles: A Microdynamical System*, E. Rehmi Post, George A. Popescu, and Neil Gershenfeld, *Applied Physics Letters* (96), p. 143501 (2010).
- (66) *Reconfigurable Asynchronous Logic Automata*, Neil Gershenfeld, David Dalrymple, Kailiang Chen, Ara Knaian, Forrest Green, Erik D. Demaine, Scott Greenwald, and Peter Schmidt-Nielsen, *POPL'10 (ACM SIGACT-SIGPLAN Symposium on Principles of Programming Languages)*, January 17-23, Madrid, Spain (2010).
- (65) *Analog Logic Automata*, K. Chen, L. Leu, L. and N. Gershenfeld, *Proceedings of the IEEE Biomedical Circuits and Systems Conference (BioCAS)*, pp. 189-192 (2008).
- (64) *Asynchronous Logic Automata*, D.A. Dalrymple, N. Gershenfeld, and K. Chen, *Proceedings of AUTOMATA 2008*, pp. 313-322 (2008).
- (63) *Ultra-Small-Sample Molecular Structure Detection Using Microslot Waveguide Nuclear Spin Resonance*, Y. Maguire, I.L. Chuang, S. Zhang, and N. Gershenfeld, *Proceedings of the National Academy of Sciences* (104), pp. 9198-9203 (2007).
- (62) *Microfluidic Bubble Logic*, M. Prakash and N. Gershenfeld, *Science* (315), pp. 832-835 (2007).
- (61) *On the Search for Quantum Control of Electronic Spin by Shaped Ultrafast Optical Pulses*, J. Taylor, A. Florean, P. Bucksbaum, and N. Gershenfeld, *Quantum Computing: Back-Action* (AIP Press, 2006).
- (60) *Digital Printing of Digital Materials*, G.A. Popescu, P. Künzler, and N. Gershenfeld, *DF 2006 International Conference on Digital Fabrication Technologies*, Denver, Colorado (2006).
- (59) *Digital Materials for Digital Printing*, G.A. Popescu, N. Gershenfeld, and T. Mahale, *DF 2006 International Conference on Digital Fabrication Technologies*, Denver, Colorado (2006).
- (58) *Internet 0: Interdevice Internetworking*, N. Gershenfeld and D. Cohen, *IEEE Circuits and Devices* (22), pp. 48-55 (2006).

- (57) *Synchronization of Pseudo-Random Signals by Forward-Only Message Passing with Application to Electronics Circuits*, B. Vigoda, H. Dauwels, M. Frey, N. Gershenfeld, T. Koch, H.-A. Loeliger, and P. Merkli, *IEEE Transactions of Information Theory* (52), pp. 3843–3852 (2006).
- (56) *SEA: a Scalable Encryption Algorithm for Small Embedded Applications*, F. Standaert, G. Piret, N. Gershenfeld, and J. Quisquater, *Springer Lecture Notes in Computer Science* (3928), pp. 222–236 (2006).
- (55) *The Internet of Things*, N. Gershenfeld, R. Krikorian, and D. Cohen, *Scientific American* (291), pp. 76–81 (2004).
- (54) *Slitted Microstrip Fabrication Using Laser Micromachining for Small Sample Detection*, Y. Maguire, R. Elavarasan, I. Chuang, and N. Gershefeld, *The 45th Experimental Nuclear Magnetic Resonance Conference* (April, 2004).
- (53) *Physical One-Way Functions*, R. Pappu, B. Recht, J. Taylor, and N. Gershenfeld, *Science* (297), pp. 2026–2030 (2002).
- (52) *A Quantum Conversation*, N. Gershenfeld, *Science* (293), pp. 2035–7 (2001).
- (51) *An Immersive, Multi-User, Musical Stage Environment*, M. Reynolds, B. Schoner, J. Richards, K. Dobson, and N. Gershenfeld, *SIGGRAPH Proceedings*, ACM, New York, NY (2001).
- (50) *Bits and Chips*, N. Gershenfeld, *New Scientist* (169), p. 55–55 (March 17, 2001).
- (49) *Remotely Interrogated Temperature Sensors based on Magnetic Materials*, R. Fletcher and N. Gershenfeld, *IEEE Transactions on Magnetics* (36), pp. 2794–2795 (2000).
- (48) *Towards a Table-Top Quantum Computer*, Y. Maguire, E. Boyden, and N. Gershenfeld, *IBM Systems Journal* (39), pp. 823–839 (2000).
- (47) *E-broidery: Design and Fabrication of Textile-based Computing*, E.R. Post, M. Orth, P.R. Russo, and N. Gershenfeld, *IBM Systems Journal* (39), pp. 840–860 (2000).
- (46) *An Installation of Interactive Furniture*, O. Omojola, E.R. Post, M.D. Hancher, Y. Maguire, R. Pappu, B. Schoner, P.R. Russo, R. Fletcher, and N. Gershenfeld, *IBM Systems Journal* (39), pp. 861–879 (2000).
- (45) *Everything, the Universe, and Life*, N. Gershenfeld, *IBM Systems Journal* (39), pp. 932–934 (2000).
- (44) *Cluster-Weighted Sampling for Synthesis and Cross-Synthesis of Violin Family Instruments*, B. Schoner, C. Cooper, and N. Gershenfeld, *Proc. International Computer Music Conference*, Berlin, Germany (August 2000).
- (43) *Cluster-Weighted Modeling: Probabilistic Time Series Prediction, Characterization and Synthesis*, B. Schoner and N. Gershenfeld, in *Nonlinear Dynamics and Statistics*, edited by Alistair Mees (Birkhaeuser, Boston, 2000).
- (42) *TouchTags: Using Touch to Retrieve Information Stored in a Physical Object*, N. Gershenfeld, and B. Vigoda, *ACM SIGCHI Conference on Human Factors in Computing Systems*, Pittsburgh, PA (May, 1999).
- (41) *Cluster-Weighted Modeling for Time Series Analysis*, N. Gershenfeld, B. Schoner, and E. Metois, *Nature* (397), pp. 329–332 (1999).
- (40) *Reconfigurable Agile Tag Reader Technologies for Combined EAS and RFID Capability*, R. Fletcher, O. Omojola, E. Boyden, and N. Gershenfeld, *Proc. of the Second IEEE Workshop on Auto-*

- matic Identification Advanced Technologies*, Summit, New Jersey, (October 1999).
- (39) *Data–Driven Modeling of Nonlinear Microwave Devices*, Bernd Schoner and Neil Gershenfeld, *Digest 53rd ARFTG Conference on Nonlinearity Characterization*, Anaheim, California (June 1999).
 - (38) *Code–Division Multiplexing of a Sensor Channel: a Software Implementation*, J.R. Smith, C. Salt-house, and N. Gershenfeld, *IEEE Journal on Selected Areas in Communications* (17), pp. 725–31 (1999).
 - (37) *Parasitic Power Harvesting in Shoes*, J. Kymisis, C. Kendall, J. Paradiso, and N. Gershenfeld, *Second IEEE International Conference on Wearable Computing*, Atlanta, GA (October 1998). (ISWC 2018 20 years impact award)
 - (36) *Data–Driven Modeling and Synthesis of Acoustical Instruments*, B. Schoner, C. Cooper, C. Douglas, and N. Gershenfeld, *International Computer Music Conference* (selected as best paper), Ann Arbor, MI (August 98).
 - (35) *Electric Field Sensing for Graphical Interfaces*, J. Smith, T. White, C. Dodge, J. Paradiso, and N. Gershenfeld, *IEEE Computer Graphics and Applications*, pp. 54–59 (May/June 1998).
 - (34) *Quantum Computing with Molecules*, N. Gershenfeld and I. Chuang, *Scientific American* (278), pp. 66–71 (June 1998).
 - (33) *Experimental Implementation of Fast Quantum Searching*, I.L. Chuang, N. Gershenfeld, and M. Kubinec, *Physical Review Letters* (80), pp. 3408–3411 (1998).
 - (32) *Bulk Quantum Computation with Nuclear Magnetic Resonance: Theory and Experiment*, I.L. Chuang, N. Gershenfeld, M.G. Kubinec, and D.W. Leung, *Proceedings of the Royal Society A* (454), pp. 447–467 (1998).
 - (31) *Intrabody Buses for Data and Power*, E.R. Post, M. Reynolds, M. Gray, J. Paradiso, N. Gershenfeld, *First International Symposium on Wearable Computers*, pp. 52–5 (IEEE Computer Society, Los Alamitos CA, 1997).
 - (30) *Application of Smart Materials to Wireless ID Tags and Remote Sensors*, R. Fletcher, J.A. Levitan, J. Rosenberg, N. Gershenfeld, in *Materials for Smart Systems II*, edited by E.P. George et. al., pp. 557–62 (Materials Research Society, Pittsburgh PA, 1997).
 - (29) *The Future of Time Series: Learning and Understanding*, N. Gershenfeld and A. Weigend, in *Pattern Formation in the Physical and Biological Sciences*, edited by H.F. Nijhout, L. Nadel, and D.L. Stein (Addison–Wesley, Reading MA, 1997).
 - (28) *Bulk Spin Resonance Quantum Computation*, N. Gershenfeld and I. Chuang, *Science* (275), pp. 350–356 (1997).
 - (27) *Musical Applications of Electric Field Sensing*, J.A. Paradiso and N. Gershenfeld, *Computer Music Journal* (21), pp. 69–89 (1997).
 - (26) *Non–Contact Sensing of People and Things*, N. Gershenfeld, *SAE Convergence* 96.
 - (25) *Signal Entropy and the Thermodynamics of Computation*, N. Gershenfeld, *IBM Systems Journal* (35), pp. 577–587 (1996).
 - (24) *Digital Dressing, or Software to Wear*, N. Gershenfeld, *The New York Times Sunday Magazine Men’s Fashion Supplement* (5/96).
 - (23) *Wearable Computing*, N. Negroponte and N. Gershenfeld, *WIRED* (12/95).

- (22) *Entrainment and Communication with Dissipative Pseudorandom Dynamics*, N. Gershenfeld, and G. Grinstein, *Physical Review Letters* (74), pp. 5024–7 (1995).
- (21) *Why I Am/Am Not a Physicist*, *Physics Today*, pp. 50–51 (July, 1995).
- (20) *Applying Electric Field Sensing to Human–Computer Interfaces*, T.G. Zimmerman, J.R. Smith, J.A. Paradiso, D.A. Allport, N. Gershenfeld, *ACM/ SIGCHI–95*.
- (19) *Results Of The Time Series Prediction Competition at the Santa Fe Institute*, A.S. Weigend and N.A. Gershenfeld, in *Proceedings of 1993 IEEE International Conference on Neural Networks*, p. 1786–93 (IEEE Press, New York, 1993).
- (18) *The Future of Forecasting*, N. Gershenfeld, *Proceedings of the SPIE* (2038) p. 241 (1993).
- (17) *Information in Dynamics*, N. Gershenfeld, in *Proceedings of the Workshop on Physics of Computation*, D. Matzke ed., pp. 276–280 (IEEE Press, New York 1993), pp. 276–280.
- (16) *Dimension Measurement on High–Dimensional Systems*, N. A. Gershenfeld, *Physica D* (55), p. 135 (1992).
- (15) *Measurement of Glasslike and Crystalline Elasticity in Quasicrystals*, J.E. VanCleve, N.A. Gershenfeld, K. Knorr, and P.A. Bancel, *Physical Review B* (41), p. 980 (1990).
- (14) *An Experimentalist’s Introduction to the Observation of Dynamical Systems*, N. Gershenfeld, in *Direction in Chaos*, Vol II, edited by Hao Bai–lin (World Scientific, Singapore, 1988), p. 310 (reviewed in *Amer. Sci.* (78), p. 73 (1990)).
- (13) *Percolating Cermet Thin Film Thermistors Between 50mK–300K and 0–20 Tesla*, N.A. Gershenfeld, J.E. VanCleve, W.W. Webb, H.E. Fischer, N.A. Fortune, J.S. Brooks, and M.J. Graf, *The Journal of Applied Physics* (64), p. 4760 (1988).
- (12) *Versatile Low Temperature and High Magnetic Field Thermometers: The Low Temperature Magneto–Resistance of Thin Film Cermets*, N.A. Gershenfeld, J. VanCleve, M.J. Graf, N.A. Fortune, and J.S. Brooks, *Proceedings of the 18th Intl. Conf. on Low Temp. Physics*, *Japanese Journal of Applied Physics supplement* (26–3) p. 1741 (1987).
- (11) *State–Selective Detection of H₂ by 1+1 REMPI via the C¹Π_u(ν′ = 0, J′) States*, A.H. Kung, T. Trickl, N.A. Gershenfeld, and Y.T. Lee, *Chemical Physics Letters* (144), p. 427 (1988).
- (10) *Temperature Dependence of Photon Stimulated Desorption Ground State and Excited States from NaCl*, E. Taglauer, N.H. Tolk, R. Riedel, E. Colavita, G. Margaritondo, N. Gershenfeld, N. Stoffel, J.A. Kelber, G. Loubriel, A.S. Bommanavar, M. Bakshi, Z. Huric, *Surface Science* (169) p. 267 (1986).
- (9) *XUV Generation in Pulsed Free Jets: Theory of Operation and Application to Detection*, A.H. Kung, N.A. Gershenfeld, C.T. Rettner, D.S. Bethune, E.E. Marinero, and R.N. Zare, in *Laser Techniques in the Extreme Ultraviolet*, edited by S.E. Harris and T.B. Lucatorto, *AIP Conf. Proc.* 119, p. 10 (1984).
- (8) *The Measurement of Optically Thick Atomic Vapor Densities by the Nonlinear Least–Squares Fitting of Absorption or Fluorescence Spectra*, N. Gershenfeld, *Nuclear Instruments and Methods A* (224) p. 570 (1984).
- (7) *Desorption Induced by Electronic Transitions*, N. Tolk, P. Bucksbaum, N.A. Gershenfeld, J.S. Kraus, R.J. Morris, D.E. Murnick, J.C. Tully, R.R. Daniels, G. Margaritondo, and N.G. Stoffel, *Nuclear Instruments and Methods B* (230) p. 457 (1984).
- (6) *A Recurring Textbook Error: Graphs of the Hydrogen Radial Probability Density*, N. Gershenfeld,

American Journal of Physics (52)p. 81 (1984).

- (5) *APL and the Numerical Solution of High-Order Linear Differential Equations*, N.A. Gershenfeld, E. H. Schadler, and O. M. Bilaniuk, American Journal of Physics (51) p. 743 (1983).
- (4) *A Versatile, High Precision Process Controller*, N. Gershenfeld and R. Darling, AT&T Bell Labs TM83-11131-41.
- (3) *An Optically Pumped ${}^6\text{Li}$ Target for PNC Studies*, D.E. Murnick, N. Gershenfeld, Y. Niv, and P.G. Pappas, in *Lasers in Nuclear Physics*, edited by C. Bemis and H.K. Carter, Harwood Academic, Chur (1982) p. 395.
- (2) *Selective Withdrawal from a Rotating Stratified Current with Applications to OTEC*, J.A. Whitehead, Jr., and N. Gershenfeld, Ocean Engineering (8) p. 507 (1981).
- (1) *Rotating Flume with Uniformly Flowing, Linear Stratified Water*, N. Gershenfeld, R. E. Frazel, and J. A. Whitehead, Jr., Reviews of Scientific Instruments (52) p. 1556 (1981).

PATENTS

- (58) 10,046,820: *Bipedal isotropic lattice locomoting explorer: robotic platform for locomotion and manipulation of discrete lattice structures and lightweight space structures* B. Jenett, K. Cheung, and Neil Gershenfeld (8/14/2018).
- (57) 10,012,569: *Microfluidic bubble logic devices* M. Prakash and N. Gershenfeld (7/3/2018).
- (56) 9,834,747: *Methods and apparatus for transplantation of nucleic acid molecules* A. Mershin, J. Pelletier, N. Gershenfeld, J. Glass, and E. Strychalski (12/5/17).
- (55) 9,809,977: *Digital material assembly by passive means and modular isotropic lattice extruder system* M. Carney, B. Jenett, and Neil Gershenfeld (11/7/2017).
- (54) 9,809,001: *Flexural digital material construction and transduction* K. Cheung, S. Calisch, and N. Gershenfeld (11/7/2017).
- (53) 9,690,286: *Methods and apparatus for digital material skins* S. Hovsepian, N. Gershenfeld and K. Cheung (6/27/2017).
- (52) 9,566,758: *Digital flexural materials* K. Cheung and N. Gershenfeld (2/14/2017).
- (51) 9,525,330: *Electropermanent magnet-based motors* A. Knaian, N. Gershenfeld and Maxim Lobovsky (12/20/2016).
- (50) 9,506,485: *Hierarchical functional digital materials* N. Gershenfeld and J.D. Ward (11/29/2016).
- (49) 9,404,835: *Microfluidic bubble logic devices* M. Prakash and N. Gershenfeld (8/2/2016).
- (48) 9,073,962: *Methods of serial assembly of DNA bricks into larger structures* C. Fracchia, N. Gershenfeld and K. Cheung (7/7/2015).
- (47) 8,986,809: *Methods and apparatus for digital composites* N. Gershenfeld and K. Cheung (3/24/2015).
- (46) 8,742,794: *Analog logic automata* N. Gershenfeld, K. Chen and J. Leu (6/3/2014).
- (45) 8,692,575: *Asynchronous logic automata* N. Gershenfeld, K. Chen and D. Dalrymple (4/8/2014).
- (44) 8,674,576: *Electropermanent magnet-based motors*, A. Knaian, N. Gershenfeld, and M. Lobovsky (3/18/2014).
- (43) 8,666,547: *Cellular automotion digital material*, K. Cheung, A. Knaian, and N. Gershenfeld

- (3/4/2014).
- (42) 8,590,377: *Inertial measurement unit*, E. Post and N. Gershenfeld (11/26/2013).
 - (41) 8,473,093: *Methods and apparatus for online calorimetry*, N. Gershenfeld, N. Peek, K. Cheung, and D. Watson (6/25/2013).
 - (40) 8,473,123: *Programmable surface*, A. Sun and N. Gershenfeld (6/25/2013)
 - (39) 8,383,061: *Microfluidic bubble logic devices*, M. Prakash and N. Gershenfeld (2/26/2013).
 - (38) 8,235,071: *Microfluidic bubble logic devices and methods*, M. Manu and N. Gershenfeld (8/7/2012).
 - (37) 8,041,037: *Cryptographic system and methods using a one way multidimensional function*, B. Recht, N. Gershenfeld, and A. Rahimi (10/18/2011).
 - (36) 8,035,414: *Asynchronous logic automata*, N. Gershenfeld, K. Chen, and D. Dalrymple (10/11/11).
 - (35) 8,013,629: *Reconfigurable logic automata*, D. Dalrymple, E. Demaine, N. Gershenfeld, F. Green, and A. Knaian (9/6/11).
 - (34) 7,918,244: *Microfluidic bubble logic devices*, M. Prakash and N. Gershenfeld (4/5/11).
 - (33) 7,860,687: *Analog continuous time statistical processing*, B. Vigoda and N. Gershenfeld (12/28/10).
 - (32) 7,848,838: *Digital assembler for digital materials*, N. Gershenfeld, P. Kunzler, and G.A. Popescu (12/7/10).
 - (31) 7,784,495: *Microfluidic bubble logic devices*, M. Prakash and N. Gershenfeld (8/31/10).
 - (30) 7,560,927: *Slitted and stubbed microstrips for high sensitivity, near-field electromagnetic detection of small samples and fields*, Y. Maguire, N. Gershenfeld, I. Chuang (7/14/09).
 - (29) 7,221,275: *Tuneable wireless tags using spatially inhomogeneous structures* Fletcher, R. Fletcher and N. Gershenfeld (5/22/2007).
 - (28) 7,209,867: *Analog Continuous Time Statistical Processing*, B. Vigoda and N. Gershenfeld (4/24/07).
 - (27) 6,891,382: *Three-dimensional characterization using a one-dimensional electrode array*, E. Post and N. Gershenfeld (5/10/05).
 - (26) 6,791,452: *Platform for item sensing and identification*, R. Fletcher, N. Gershenfeld, P. Yarin, and H. Ishii (9/14/04).
 - (25) 6,724,310: *Frequency-based wireless monitoring and identification using spatially inhomogeneous structures*, N. Gershenfeld and R. Fletcher (4/20/04).
 - (24) 6,693,540: *Wireless Monitoring and Identification using Spatially Inhomogeneous Structures*, N. Gershenfeld and R. Fletcher (2/17/04).
 - (23) 6,642,837: *Method and Apparatus for Touch-Activated Identification and Information Transfer*, B. Vigoda and N. Gershenfeld (11/4/03).
 - (22) 6,584,214: *Identification and Verification using Complex Three-Dimensional Structural Features*, R. Pappu, N. Gershenfeld, and J.R. Smith (6/24/03).
 - (21) 6,493,933: *Method of Making Flexible Electronic Circuitry*, E.R. Post and N. Gershenfeld (12/17/02).
 - (20) 6,472,987: *Wireless Monitoring and Identification using Spatially Inhomogeneous Structures*, N. Gershenfeld and R. Fletcher (10/29/02).

- (19) 6,460,557: *Transmissionless Pressure–Control Valve*, J. Levitan, N. Gershenfeld, and E. Blanco (10/8/02).
- (18) 6,211,799: *Method and Apparatus for Transbody Transmission of Power and Information*, E.R. Post, B. Nivi, and N. Gershenfeld (4/3/01).
- (17) 6,208,253: *Wireless Monitoring of Temperature*, R. Fletcher and N. Gershenfeld (3/27/01).
- (16) 6,200,508: *Method of Fabricating Electro–Mechanical Devices by Multilayer Deposition*, J. Jacobson, J. Albert, and N. Gershenfeld (3/13/01).
- (15) 6,066,954: *Apparatus for Resolving Presence and Orientation within a Defined Space*, N. Gershenfeld and J. Smith (5/23/00).
- (14) 6,051,981: *Method and apparatus for characterizing movement of a mass within a defined space*, N. Gershenfeld and J. Smith (4/18/00).
- (13) 6,025,726: *Method and apparatus for determining three–dimensional position, orientation and mass distribution*, N. Gershenfeld and J. Smith (2/15/00).
- (12) 6,025,725: *Electrically Active Resonant Structures for Wireless Monitoring and Control*, N. Gershenfeld and R. Fletcher (2/15/00).
- (11) 6,000,833: *Efficient Synthesis of Complex Systems*, N. Gershenfeld, E. Metois, and B. Schoner (12/16/99).
- (10) 5,936,412: *Method For Resolving Presence, Orientation, and Activity in a Defined Space*, N. Gershenfeld and J. Smith (8/10/99).
- (9) 5,914,610: *Apparatus and Method for Characterizing Movement of a Mass Within a Defined Space*, N. Gershenfeld and J. Smith (6/22/99).
- (8) 5,914,701: *Non–Contact System For Sensing And Signalling By Externally Induced Intra–Body Currents*, D. Allport, N. Gershenfeld, and T. Zimmerman (8/6/97).
- (7) 5,917,322: *Method and Apparatus for Quantum Information Processing*, I. Chuang and N. Gershenfeld.
- (6) 5,844,415: *Method for Three–Dimensional Positions, Orientation, and Mass Distribution*, N. Gershenfeld and J.R. Smith (12/1/98).
- (5) 5,790,025: *Tamper Detection Using Bulk Multiple Scattering*, N. Amer, D. DiVincenzo, N. Gershenfeld (8/4/98).
- (4) 5,612,973, 5,729,388, 5,737,360: *System Employing Dissipative Pseudorandom Dynamics For Communications and Measurement*, N. Gershenfeld and G. Grinstein (3/18/97, 3/17/98, 4/7/98).
- (3) 5,579,337: *System Employing Dissipative Pseudorandom Dynamics and Selective Feedback for Communications and Measurement*, G. Grinstein and N. Gershenfeld (11/26/96).
- (2) 5,247,261: *Method and Apparatus for Electromagnetic Non–Contact Position Measurement With Respect To One Or More Axes*, N.A. Gershenfeld (9/21/93).
- (1) 4,906,968: *Percolating Cermet Thin Film Thermistor*, N.A. Gershenfeld, W.W. Webb, J. VanCleve, J.V. Mantese, and E.T. Swartz (4/6/90).