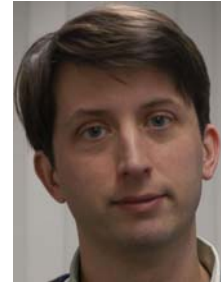


Curriculum Vitae

Eric David Williams



Citizenship: USA
Date of Birth: October 29, 1965
Family info: Married, with two children

Contact Information

Department of Civil and Environmental Engineering &
The Global Institute of Sustainability
Arizona State University
Tempe, Arizona 85287-5306
Phone: (480) 727-6259 Fax: (480) 965-0557
Email: ericwilliams@asu.edu

Education

- 1993 Ph.D. in Physics, C.N. Yang Institute for Theoretical Physics, Department of Physics, State University of New York at Stony Brook, Stony Brook, New York
- 1988 B.A. in Physics, Macalester College, St. Paul, Minnesota

Professional Experience

- 8.2006 – present Assistant Professor, Department of Civil and Environmental Engineering & Global Institute of Sustainability, Arizona State University, Tempe
- 9.2005- 7.2006 Visiting Assistant Professor, Department of Civil and Environmental Engineering, Carnegie Mellon University, Pittsburgh
- 9.2001 – 7.2006 Project Coordinator, United Nations University/Centre, Tokyo
- 9.2000 – 8.2001 Associate Fellow, United Nations University/Institute of Advanced Studies (UNU/IAS), Tokyo
- 9.1997 – 8.2000 Research Associate, UNU/IAS, Tokyo
- 9.1995 – 8.1997 JSPS Postdoctoral Fellow, Institute for Solid State Physics, University of Tokyo, Japan
- 9.1994 – 8.1995 Temporary Assistant Professor, Department of Mathematics, University of Minnesota, Minneapolis
- 9.1993 – 8.1994 Visiting Researcher, Department of Mathematics, University of Minnesota, Minneapolis

Publications

Articles submitted to or published in refereed journals

1. E. Williams, B. Warr, and R. Ayres, "Efficiency dilution: Long-term exergy conversion trends in Japan", **in press**, *Environmental Science & Technology* (2008)
2. R. Kahhat, J. Kim, M. Xu, B. Allenby, and E. Williams, "E-Market for E-waste: an alternative management system for the U.S.", **in press**, *Resources, Conservation and Recycling* (2008)
3. C. I. Davidson, C. T. Hendrickson, H. Scott Matthews, M.W. Bridges, B. Allenby, J. Crittenden, Y. Chen, E. Williams, D. Allen, C. Murphy, and S. Austin, "Adding Sustainability to the Engineer's Toolbox: A Challenge for Engineering Educators", *Environmental Science & Technology* 41(14), 4847-4850 (2007)
4. P. Marcotullio and E. Williams, "Exploring effects of an "infrastructure bottleneck" on road transportation CO₂ emissions in Asia Pacific countries", *International Journal of Environment and Pollution* 30(7), 27-43 (2007)
5. A. Terazono, S. Murakami, N. Abe, B. Inanc, Y. Moriguchi, S. Sakai, M. Kojima, A. Yoshida, J. Li, J. Yang, M. H. Wong, A. Jain, I. Kim, G. L. Peralta, C.C. Lin, T. Mungcharoen, and E. Williams, "Current status and research on E-waste issues in Asia", *J. Material Cycles and Waste Management*, 1-12 (2006)
6. K. Tokimatsu, T. Kosugi, T. Asami, E. Williams, and Y. Kaya, "Evaluation of lifecycle CO₂ emissions from the Japanese electric power sector in the 21st century under various nuclear scenarios", *Energy Policy* 34(7), 833-852 (2006)
7. P. Marcotullio, E. Williams and J. Marshall, "Faster, sooner, and more simultaneously: how recent transportation CO₂ emission trends in developing countries differ from historic trends in the United States of America", *Journal of Environment & Development* 13 (3), 125-148 (2005)
8. H.S. Matthews and E. Williams, "Telework adoption and energy use in building and transport sectors in the US and Japan", *Journal of Infrastructure Systems* 11(1), 21-30 (2005)
9. E. Williams, "Energy intensity of computer manufacturing: hybrid analysis combining process and economic input-output methods", *Environmental Science & Technology* 38(22), 6166 - 6174 (2004)
10. E. Williams, "The environmental impacts of semiconductor fabrication", *Thin Solid Films* 461(1), 2-6 (2004)
11. R. Ayres and E. Williams, "The digital economy: where do we stand?", *Technological Forecasting and Social Change* 71(4), 315-339 (2004)
12. E. Williams, "Forecasting material and economic flows of the global production chain for silicon", *Technological Forecasting and Social Change* 70(4), 341-357 (2003)
13. E. Williams and T. Tagami, "Energy use in sales and distribution via B2C E-commerce and conventional retail: a case study of the Japanese book sector", *Journal of Industrial Ecology* 6(2), 99-114 (2003)
14. E. Williams, R. Ayres, and M. Heller, "The 1.7 kg microchip: energy and chemical use in the production of semiconductors", *Environmental Science & Technology* 36 (24), 5504-5510, Dec. 15 (2002) (cover story)

15. H. Scott Matthews, E. Williams, C. Hendrickson, and T. Tagami, “Energy implications of online book retailing in the United States and Japan”, *Environmental Impact Assessment Review* 22(5), 493-507 (2002)
16. R. Beals, D. Sattinger, and E. Williams, “A Dirac Sea and thermodynamic equilibrium for the quantized three-wave interaction”, *Journal of Mathematical Physics* 39 (1), 1-29, (1998)
17. M. Takahashi and E. Williams, “Disconnection transition in an extended delta-function Bose gas”, *Journal of the Physical Society of Japan* 66, 3322-3325 (1997).
18. E. Williams, “Exact wavefunctions for a delta function Bose gas with higher derivatives”, *Physics Letters A* 223, 19-22 (1996)
19. E. Williams, “Thermodynamics and excitations of the supersymmetric t-J model”, *International Journal of Modern Physics, B* 9 (27), 3607-3624 (1995)
20. E. Williams, “Strings complete the spectrum of 1-D δ -function fermions”, *Modern Physics Letters B*, 689-701 (1993)

Books, monographs, conference proceedings

21. R. Kuehr and E. Williams (eds.), *Computers and the Environment: Understanding and Managing their Impacts*, Kluwer Academic Publications: Dordrecht (2003)
22. E. Williams, *Global Production Chains and Sustainability: the case of high-purity silicon and its applications in Information Technology and renewable energy*, United Nations University/Institute of Advanced Studies: Tokyo, 140 pages (2000)
23. C. Suzuki and E. Williams (eds.), *Proceedings of the First Workshop on the Quartz Industrial Trade System*, United Nations University/Institute of Advanced Studies: Tokyo, ISBN# 4-906686-C, 248 pages (1998)

Book chapters

24. R. Kuehr, J. Velasquez and E. Williams, “Computers and the environment—an introduction to understanding and managing their impacts”, in R. Kuehr and E. Williams (eds.), *Computers and the Environment: Understanding and Managing their Impacts*, Kluwer Academic Publications: Dordrecht, 1-16 (2003)
25. E. Williams, “Environmental impacts associated with the production of personal computers”, in R. Kuehr and E. Williams (eds.), *Computers and the Environment: Understanding and Managing their Impacts*, Kluwer: Dordrecht, 41-72 (2003)
26. E. Williams and Y. Sasaki, “Strategizing the end-of-life handling of personal computers”, in R. Kuehr and E. Williams (eds.), *Computers and the Environment: Understanding and Managing their Impacts*, Kluwer: Dordrecht, 183-196 (2003)
27. E. Williams and R. Kuehr, “Today’s Markets for Used PCs—And Ways to Enhance Them”, in R. Kuehr and E. Williams (eds.), *Computers and the Environment: Understanding and Managing their Impacts*, Kluwer: Dordrecht, 197-210 (2003)
28. E. Williams, “Environmental Life Cycle Assessment and Municipal Solid Waste Management”, in *Encyclopedia of Life Support Systems*, E1-18: Institutional and Infrastructural Resources, Human Settlement Development, edited by Saskia Sassen, United Nations Educational, Scientific and Cultural Organization: Paris (2003)

Articles in conference proceedings and working papers

29. L. Deng and E. Williams, “Measures and Trends in Energy Use of Semiconductor Manufacturing”, to appear in Proceedings of the 2008 IEEE International Symposium on Electronics and the Environment, San Francisco, CA (2008)
30. Y. Yang and E. Williams, “Forecasting sales and generation of end-of-life computers in the U.S.”, to appear in Proceedings of the 2008 IEEE International Symposium on Electronics and the Environment, San Francisco, CA (2008)
31. N. Krishnan, E. Williams and S. Boyd, “Case Studies in Energy Use to Realize Ultra-High Purities in Semiconductor Manufacturing”, to appear in Proceedings of the 2008 IEEE International Symposium on Electronics and the Environment, San Francisco, CA (2008)
32. R. Kahhat, J. Kim, M. Xu, B. Allenby, and E. Williams, “Exploring e-waste management systems in the U.S.”, to appear in Proceedings of the 2008 IEEE International Symposium on Electronics and the Environment, San Francisco, CA (2008)
33. J. Kim, M. Xu, R. Kahhat, B. Allenby, and E. Williams, “Design and Assessment of a Sustainable Networked System in the U.S.: Case study of Book Delivery System”, to appear in Proceedings of the 2008 IEEE International Symposium on Electronics and the Environment, San Francisco, CA (2008)
34. E. Williams, R. Kahhat, B. Allenby, E. Kavazanjian, J. Kim and M. Xu, “Sustainability review of the international reverse chain for reuse and recycling of computers”, to appear in Proceedings of the 2008 IEEE International Symposium on Electronics and the Environment, San Francisco, CA (2008)
35. E. Williams, B. Warr, and R. Ayres, “Long Term Exergy-efficiency Trends in Japan”, in Proceedings of Eco-Design 2007 - 5th International Symposium on Environmentally Conscious Design and Inverse Manufacturing, Tokyo: Japan (2007)
36. E. Williams and H. Scott Matthews, “Scoping the potential of monitoring and control technologies to reduce energy use in homes”, in *2007 IEEE International Symposium on Electronics and the Environment*, IEEE: Piscataway, New Jersey, 239-244 (2007)
37. C. Weber, H. Scott Matthews, J. Corbett and E. Williams, “Carbon Emissions Embodied in Importation, Transport and Retail of Electronics in the U.S.: A Growing Global Issue”, in *2007 IEEE International Symposium on Electronics and the Environment*, IEEE: Piscataway, New Jersey, 174-179 (2007)
38. E. Williams, “The case for improved uncertainty analysis of LCI”, in *Proceedings of the Seventh International Conference on Ecobalance*, published by the Society for Non-traditional Technology: Tokyo, 249-252 (2006)
39. Hendrickson, C., H.S. Matthews and E. Williams, “Experience with the Economic Input-Output Life-Cycle Assessment Website”, in *Proceedings of the Seventh International Conference on Ecobalance*, published by the Society for Non-traditional Technology: Tokyo, 243-244 (2006)
40. E. Williams, H. Scott Matthews, M. Breton and T. Brady, “Use of a computer-based system to measure and manage energy use in the home”, *2006 IEEE International Symposium on Electronics and the Environment*, IEEE: Piscataway, New Jersey, 161-166 (2006)

41. E. Williams, Mandated prices as an instrument to mitigate environmental impacts in informal reuse/recycling, Proceedings of The Second National Institute for Environment Studies (NIES) Workshop on E-waste: November 23rd, Tokyo, Japan, pp 43-56 (2005).
42. E. Williams and T. Hatanaka, "The relevance of computer usage patterns and secondary markets for energy management", in *Proceedings of the 2005 ACEEE Summer Study on Energy Efficiency in Industry*, American Council for an Energy-Efficient Economy: Washington D.C. (2005)
43. E. Williams, "International activities on E-waste and guidelines for future work", in Proceedings of The Third Workshop on Material Cycles and Waste Management in Asia, National Institute of Environmental Sciences: Tsukuba, Japan, 49-60 (2005)
44. E. Williams and T. Hatanaka, "Residential computer usage patterns in Japan and associated life cycle energy use", in *2005 IEEE International Symposium on Electronics and the Environment*, IEEE: Piscataway, New Jersey, 177-182 (2005)
45. E. Williams, "Revisiting Energy used to Manufacture a Desktop Computer", in *2004 IEEE International Symposium on Electronics and the Environment*, IEEE: Piscataway, New Jersey, 80-85 (2004)
46. E. Williams, "Hybrid analysis of energy used to manufacture a desktop computer", in *Proceedings of the Sixth International Conference on Ecobalance*, published by the Society for Non-traditional Technology: Tokyo, 71-74 (2003)
47. E. Williams and H.S. Matthews, "Potential impact of telework programs on energy use in the US and Japan", Proceedings of Proceedings of 11th LCA Case Studies Symposium - Environmental Assessment in the Information Society, SETAC: Belgium, 77-80 (2003)
48. E. Williams, "Life cycle energy of computer manufacturing", Proceedings of Proceedings of 11th LCA Case Studies Symposium - Environmental Assessment in the Information Society, SETAC: Belgium, 122-125 (2003)
49. E. Williams, "Assessing the potential of telecommuting as an energy savings technology in Japan", in *2003 IEEE International Symposium on Electronics and the Environment*, IEEE: Piscataway, New Jersey, 147-152 (2003)
50. E. Williams, "Energy analysis of end-of-life for personal computers: resell, upgrade, recycle", in *2003 IEEE International Symposium on Electronics and the Environment*, IEEE: Piscataway, New Jersey, 187-192 (2003)
51. E. Williams, "Extending PC lifespan through secondary markets", in *2003 IEEE International Symposium on Electronics and the Environment*, IEEE: Piscataway, New Jersey, 255-259 (2003)
52. E. Williams and T. Hatanaka, "Sustainable consumption and the Information Technology revolution", in *Proceedings of the First International Workshop on Sustainable Consumption*, Society for Non-Traditional Technology: Tokyo, 69-75 (2003)
53. E. Williams, "Energy efficiency of b2c E-commerce in Japan", in *2002 IEEE International Symposium on Electronics and the Environment*, IEEE: Piscataway, New Jersey, 38-43 (2002)
54. E. Williams, R. Ayres, and M. Heller, "Energy and chemical use in the production chain for microchips", in *2002 IEEE International Symposium on Electronics and the Environment*, IEEE: Piscataway, New Jersey, 184-189 (2002)

55. E. Williams and T. Tagami, “Energy analysis of e-commerce and conventional retail distribution of books in Japan”, in *Sustainability in the Information Society*, Metropolis Verlag: Marburg, Germany, 73-80 (2001)
56. E. Williams, “Systems Analysis of the Global Production Chain for High-purity Silicon”, in *Proceedings of the Fourth International Conference on Ecobalance*, published by the Society for Non-traditional Technology: Tokyo, 577-580 (2000)
57. E. Williams and M. Troyer, “A Framework for Computer Aided Modeling, Design, and Optimization of Integrated Industrial Systems”, UNU/IAS Working Paper #54, United Nations University/Institute of Advanced Studies: Tokyo, 20 pages (1998)
58. E. Williams, “Towards Quantitative Design of Zero Emissions Industrial Clusters: Choice of Variables and Fractal Invariance”, in *Proceedings of the Targeting Zero Emissions for the Utilization of Renewable Resources*, University of Tokyo: Tokyo, 98-102 (1998).
59. E. Williams, “Computer Models as Description and Design Tools for QITS”, in *Proceedings of the First Workshop on QITS*, United Nations University: Tokyo, ISBN# 4-906686-C, 138-144 (1998)
60. J. Gravitis, T. Della Senta, and E. Williams, “The Conversion of Biomass into Fuels, Fibers, and Value-added Chemical Products from the Perspective of the Zero Emissions Concept”, in *Proceedings of the Symposium on Biomass Conversion*, Sapporo, Japan, 1-18 (1997)

Fundraising experience/awards

(joint award) Industrial Ecology Fellow, “Substitution and Complementarity of ICT products and services”, *AT&T Foundation*, Jan 2008-Dec. 2008 (\$25,000)

(P.I.) Research Project, “Life Cycle Water Use of Alternative Transportation Fuels”, *Arizona Water Institute*, Jan 2008- September 2008 (\$20,000)

(P.I.) Research Project, “Assessing and managing the sustainability of global reverse supply chains: the case of personal computers”, *National Science Foundation*, Environmental Sustainability program, Sep 2007- Aug 2010 (\$350,000)

(co-PI) Research project, “Environmental and Economic Impacts of Material Used in Future Urban Development”, *Science Foundation Arizona*, Jan 2007-Mar 2008 (\$399,000)

(joint award): Industrial Ecology Fellow, “Information Technology-based monitoring and control systems to mitigate energy use in households”, *AT&T Foundation*, Jan 2006-Dec. 2006 (\$25,000)

(co P.I.) Scoping research: “Environmental applications of Information Technology”, *Intel*, June 2005-Dec. 2005 (\$6,000)

(co P.I.) Project development: “Solving the E-waste problem: a synthetic approach”, *Hewlett Packard*, April 2005-March 2006 (\$50,000)

(P.I.) Research project: “Roadmapping the adoption of energy efficient technologies in the Chinese iron/steel industry”, *New Energy and Industrial Technology Development Organization (NEDO)* – Japan, April 2005-March 2006 (\$25,000)

(P.I.) Research project: “Energy consumption of IT infrastructure in Asia - Computer Use Patterns”, *New Energy and Industrial Technology Development Organization (NEDO)* – Japan, April 2004-March 2005 (\$25,000)

(co P.I.) Research project: “Testing the theory of telescoping environmental transitions”, *U.S. Environmental Protection Agency*, Mar. 2004-August 2004 (\$23,000)

(joint award), Industrial Ecology Fellow: “Effects of computer usage patterns on the life cycle energy consumption of IT infrastructure”, *AT&T Foundation*, Jan 2004-Dec. 2004 (\$25,000)

(co P.I.) Research project: “The Digital Economy and Energy”, *Japan Foundation - Center for Global Partnership*, June 2001- May 2003, (\$160,000)

Event co-funding: “International Symposium on Information Technology and the Environment”, held Oct. 2002 in Tokyo: support from the *Japan Zero Emissions Forum* (\$10,000) and *Ministry of Science and Education Committee on Zero Emissions* (\$5,000).

(Award) Takeda Fellowship Award for Outstanding Researchers, *Takeda Foundation*, Sept. 2001-Aug. 2002 (\$40,000).

Education

Courses taught (details of teaching evaluations available on request):

#	Dates	Course	Department/Institution
1	Spring 2008, Spring 2007	Industrial Ecology and Design for Sustainability	Civil and Environmental Engineering & School of Sustainability, Arizona State University
2	Fall 2007, Fall 2006	Engineering Business Practice	Civil and Environmental Engineering, Arizona State University
3	Spring 2005	Advanced Life Cycle Assessment	Civil and Environmental Engineering, Carnegie Mellon University
4	Spring 2004, 2005	Environmental Governance	School of International Politics, Econ. and Business, Aoyama University, Tokyo
5	5.2003- 4.2004	Special topics in Env. Engineering	Engineering division, Osaka Prefectural University
6	5. 2002, 2004	International Course	United Nations University, Tokyo
7	Spring 1995	Fourier Analysis	Dept. of Mathematics, Univ. of Minnesota
8	Spring 1995	Calculus II	Dept. of Mathematics, Univ. of Minnesota
9	Fall 1994	Calculus I	Dept. of Mathematics, Univ. of Minnesota
10	Fall 1994	Pre-Calculus	Dept. of Mathematics, Univ. of Minnesota

Notes:

1. Graduate course, role: primary instructor
2. Upper division undergraduate course, role: primary instructor
3. Graduate course, part of CMU CEE Sustainable Engineering sequence, role: primary instructor
4. Master's degree course, Role: co-instructor
5. Undergraduate topics seminar, Role: guest lecturer
6. Intensive, one month non-accredited course, Role: guest lecturer
7. Upper division undergraduate course, Role: primary instructor
8. Lower division undergraduate course Role: head instructor of multi section course (includes coordination of teaching assistants for recitation sections)
9. Lower division undergraduate course, Role: head instructor of multi section course (includes coordination of teaching assistants for recitation sections)
10. Lower division undergraduate course, Role: head instructor of multi section course (includes coordination of teaching assistants for recitation sections)

Advising of graduate students:

As primary advisor:

Ramzy Kahhat, Civil and Environmental Engineering, ASU, PhD expected 2009

Yan Yang, Civil and Environmental Engineering, ASU, M.S. expected 2009

Liqui Deng, School of Sustainability, ASU, PhD expected 2011

Chris Harto, School of Sustainability, ASU, PhD expected 2011

Carolyn Mattick, School of Sustainability, ASU, M.S. expected 2009

Robert J. Meyers, School of Sustainability, ASU, M.S. expected 2009

As thesis committee member:

Junbeum Kim, Civil and Environmental Engineering, PhD expected 2009

Ming Xu, Civil and Environmental Engineering, PhD expected 2009

Christopher Weber, Civil and Environmental Engineering/Engineering and Public Policy, Carnegie Mellon, PhD exam passed, Spring 2008

Service

Committee and panel membership

National Academy of Sciences: Member, Committee on Point of Use and Full Fuel Cycle Measurement Approaches to Energy Efficiency Standards, Jan. – Dec. 2008

IEEE: Conference Chair, IEEE International Symposium on Electronics and the Environment, May 2008, San Francisco, California

National Science Foundation: Review Panel member, Environmental Sustainability program, December 2007

Arizona State University: Undergraduate Committee, School of Sustainability, October 2007- present

International Society for Industry Ecology: Program Committee, International Conference of the International Society for Industry Ecology, June 2007, Toronto, Canada

IEEE: Program Chair, IEEE International Symposium on Electronics and the Environment, May 2007, Orlando, Florida

IEEE: Program Co-chair, IEEE International Symposium on Electronics and the Environment, May 2005, New Orleans, Louisiana

IEEE: Program Co-chair, IEEE International Symposium on Electronics and the Environment, May 2004, Phoenix, Arizona

Professional review activities for international journals

Energy: the International Journal
Environmental Impact Assessment Review
Environmental Science & Technology
IEEE Symposium on Electronics & the Environment
International Journal of Life Cycle Assessment
Global Environmental Politics
Journal of Industrial Ecology
Journal of Material Cycles and Waste Management
Journal of the Air & Waste Management Association
ASCE Journal of Infrastructure Systems
Resources, Conservation and Recycling
Sustainability Science

Language Skills

- English - native
- Japanese – fluent in spoken and written language (passed level 1 Japanese Proficiency Exam)

Outreach: Media coverage of research (selected sampling)

Popular media Print/Web

1. Financial Times, "IT going green: Are the problems just being passed on?", July 11, 2007
2. AZ Republic, "Out with the old, but where to...", July 2, 2007
3. Financial Times, "Computer makers miss the big green picture", June 7, 2007
4. PC Magazine, "What's Inside a Laptop", April 10, 2007, p. 87-91
5. Foreign Policy, "Pollution Solution", September/October 2004, p. 92
6. Reuters, "Used or upgraded PCs can help wallet, environment", Mar 9, 2004
7. The Guardian, "PCs – the latest trash mountain", March 8, 2004, p. 2
8. Times of London, "Short-lived computers creating 'toxic trash'", Mar 8, 2004, p. 10
9. WorldWatch, "Microchips are tiny, but their environmental footprint is heavy", 16(2). Mar/Apr 2003, p. 8
10. Sierra, "Little Chips, Big Impact", March/April 2003, p. 68
11. BBC, "Chips cost environment dear", Nov. 12, 2002 (URL: <http://news.bbc.co.uk/2/hi/technology/2444675.stm>)
12. Business Week, "Microchips weigh heavily on environment", Dec. 15, 2002 (URL: <http://www.businessweek.com/technology/cnet/stories/964721.htm>)
13. Globe and Mail, "Computer chip production raises environmental questions", January 27, 2002, Business section p. 1
14. Financial Times, "Green pressure on chips ", December 5, 2002, p. 13

Science/Engineering Print/Web

1. Nature Materials, "Heavy Computing", vol. 3 no. 5, 2004, p. 287
2. Electronic Engineering Times, "Running the numbers", Mar. 22, 2004, p. 59
3. Science, "The Macro side of Microchips", Nov. 8, 2002, 298(5586), p. 1137
4. New Scientist, "Computing's dirty little secret is finally revealed", Nov. 16, 2002, 176(2369), p. 8
5. Nature, "Why microchips weigh over a kilogram", Nov.2, 2002 (URL: <http://www.nature.com/nsu/021028/021028-12.html>)
6. Scientific American, "Making Microchips Takes Mountain of Materials", Nov. 6, 2002 (URL: <http://www.sciam.com/article.cfm?chanID=sa003&articleID=0000E57E-E47B-IDC6-AF71809EC588EEDF>)
7. Science News, "Hidden costs: it takes much stuff to make one tiny chip", November 16, 2002, p. 309
8. Chemical & Engineering News, "Heavy Burden of Microchips", Dec. 23, p. 25-27
9. Electronic Engineering Times, "Chips, toxics and real life", 1278, p. 81, December 2002

Radio/Television

1. BBC World Service radio ("World Update", Mar. 8, 2004; "Go Digital, Mar 8, 2004; "World Today, Mar. 6, 2004, "Go Digital" Nov. 11, 2002)
2. Voice of America (March 13, 2004)
3. Canadian Broadcasting Corporation radio ("As It Happens" Nov 28, 2002; "The Current", Mar 9, 2004)
4. National Public Radio ("Future Tense", March 11, 2004)
5. CNBC television("Tech Watch", 11:30, Mar. 10, 2004)
6. BBC television (Domestic Service, March 8, 2004)