Curriculum Vitae: Erica R.H. Fuchs

1. Biographical Data

1.A Education

Degree	Discipline	University	Date
Ph.D.	Engineering Systems	M.I.T.	2006
S.M.	Technology Policy	M.I.T.	2003
S.B.	Materials Science & Engineering	M.I.T.	1999

1.B Academic Positions

2012-Present
Associate Professor, Department of Engineering and Public Policy
Carnegie Mellon University, Pittsburgh, PA

2007-2012
Assistant Professor, Department of Engineering and Public Policy
Carnegie Mellon University, Pittsburgh, PA

2006-2007
Postdoctoral Fellow, Microphotonics Center and Industrial Performance Center
Massachusetts Institute of Technology, Cambridge, MA
Advised Technology Policy masters student Shan Liu on research on the economic viability of silicon photonics, developed the technical and economic framework for the 2006 Industry Roadmap, brought in $25,000 funding from Kotura Corporation

1999-2000
Research Fellow
United Nations Industrial Development Organization, Beijing, China
Initiated and led field research on institutional barriers to innovation in state-owned industrial boiler manufacturers in the People's Republic of China.

1.C Other Positions

June-August 2001
Internal Consultant to the Executive Team, Intern
Nanogram Corporation, Fremont, CA

Modeled the economic viability of the start-up's new, photonic deposition technology against the prevailing alternatives on the market.

June-August 1998
Technical Failure Analysis Engineer, Intern
Bayer Corporation, Cologne, Germany
Assessed the cause of microbial corrosion in Bayer's steel coolant piping system. Research results published as part of my undergraduate M.I.T. thesis.

June-August 1997
Researcher, Intern
OVAKO Steel / Royal Institute of Stockholm, Hofors / Stockholm, Sweden
Analyzed inclusion characteristics in high-performance ball bearing steel using optical and SEM microscopy. Presented at 1998 Society for Mining, Metallurgy, and Exploration Annual Meeting and published in the journal of *High Temperature Materials and Processes*.

1.D Consulting Assignments

March, 2011 – September 2011
Academic Expert
Invited speaker and expert for day-long discussion and subsequent formulation of policy white papers by West-Coast industry and regional economic leaders on "Innovation and Production: Reviving U.S. Prosperity," CONNECT Innovation Institute.

November 5, 2010
Executive Educator
Led half-day workshop on "The Automotive Setting in 2025." Advanced Development. Product Design and Development. Alcoa Technology Center. Alcoa, Inc.

September 19, 2008
Executive Educator
Chris Kubasik, Sr. VP, Electronic Systems Business Area, Lockheed Martin Corporation, Senior Executive Engineering Program, Carnegie Mellon University

2. Publications

2.A Archival Papers Critically Reviewed Before Publication

Published Papers

1. **Fuchs, E.** 2014. Global Manufacturing and the Future of Technology. *Science*. 345(6196): 519-520.

2. Woolley, A. and **Fuchs, E.** 2011. Collective Intelligence in the Organization of Science, Invited Paper. Special Issue on New Directions in Organization Science. *Organization Science*. 22(5): 1359-1367.

3. **Fuchs, E.**, Kirchain, R., and Liu, S. 2011. The Future of Silicon Photonics – Not So Fast?: Insights from 100G Ethernet LAN Transceivers. *Journal of Lightwave Technology*. 29(15): 2319-2326.

4. **Fuchs, E.**, Field, F., Roth, R., and Kirchain, R. 2011. Plastic Cars in China? The Signifiance of Production Location over Markets for Technology Competitiveness in the United States versus the People's Repulic of China. *International Journal of Production Economics*. 132(2011): 79-92.

5. **Fuchs, E.**, and Kirchain, R. 2010. Design for Location?: The Impact of Manufacturing Off-Shore on Technology Competitiveness in the Optoelectronics Industry. *Management Science,* 56(12): 2323-2349.

6. **Fuchs, E.** 2010. Rethinking the Role of the State in Technology Development: DARPA and the Case for Embedded Network Governance, **Lead article.** *Research Policy,* 39(2010): 1133-1147.

7. **Fuchs, E.** 2009. Cloning DARPA Successfully. *Issues in Science and Technology*. Volume XXVI. Number 1. Fall 2009.

8. **Fuchs, E.**, Field, F., Roth, R., and Kirchain, R. 2008. Strategic Materials Selection in the Automotive Body: Economic Opportunities for Polymer Composite Design. *Composite Science and Technology*. 68(9): 1989-2002.

9. **Fuchs, E.**, Bruce, E., Ram, R., and Kirchain, R. 2006. Process-Based Cost Modeling of Photonics Manufacture: The Cost-Competitiveness of Monolithic Integration of a 1550nm DFB Laser and an Electro-Absorptive Modulator on an InP Platform. *Journal of Lightwave Technology*. 24(8): 3175-3186.

10. Veloso, Francisco and **Fuchs, E.** 2002. The Future of the Asian Auto Industry: Regional Integration, Alternative Designs, and Chinese Leadership. *International Journal of Vehicle Design*. 35(1): 111-136.

11. **Fuchs, E.** and Johnsson, P. 2000. Inclusion Characteristics in Bearing Steel and During Ingot Casting. *High Temperature Materials and Processes*. 19(5): 333-344

Working Papers

11. Denomme, C., Epple, D., Argote, L., and **Fuchs, E.** 2014. Learning by Doing in a Multi-Product Manufacturing Environment: Product Variety, Customizations, and Overlapping Product Generations. NBER Working paper No 19674. http://www.nber.org/papers/w19674 Revise and Resubmit, *Management Science*.

12. Helveston, J., Liu, Y., Feit, E., **Fuchs, E.,** Klampfl, E., and Michalek, J. 2014. Will subsidies drive electric vehicle adoption in China and the U.S.? *Revise and Resubmit, Transportation Research Part A: Policy and Practice*.

13. Ventura, S., Nugent, R., and **Fuchs, E.** 2014. Seeing the Non-Stars: (Some) Sources of Bias in Past Disambiguation Approaches and a New Public Tools Leveraging Labeled Records. http://ssrn.com/abstract=2079330 . *Under review*.

14. Yang, C., Nugent, R., and **Fuchs, E.** 2014. Gains from Other's Losses: Technology Trajectories and the Global Division of Firms. http://ssrn.com/abstract=2080595

15. Sakti, A., Michalek, J., **Fuchs, E.**, and Whitacre, J. 2014. A techno-economic analysis and optimization of Li-ion batteries for personal vehicle electrification. Under review at *Journal of Power Sources*.

16. Khan, H., Hounshell, D. and **Fuchs, E.** 2014. A new role for public-private partnerships in long-term technology development?: Insights from the nanoelectronics research initiative.

17. Akinsanmi, W., Reagans, R., and **Fuchs, E.** 2014. Seeing Rainbows while Others Flee: How innovation in the most advanced optoelectronics technology grew after the burst of the telecommunications bubble.

18. Sakti, A., Azevedo, I., **Fuchs, E.**, Michalek, J., Gallagher, K., and Whitacre, J. An elicitation of expert assessments of current and future Li-ion battery cell and pack cost, and designs for personal vehicle electrification

19. Yang, C. and **Fuchs, E.** Bought but not played with: IP Licensing, Acquisitions and Dormant technological opportunities.

20. **Fuchs, E.** 2014. On the relationship between manufacturing and innovation: Why not all technologies are created equal. http://ssrn.com/abstract=2103827

21. **Fuchs, E.** 2014. Platform Leaders, True Believers and Coordinated Innovation: The Role of Key Architects in Influencing Technology Trajectories for Moore's Law.

2.B. Books

22. (Committee Member.) 2013. *Optics and Photonics: Essential Technologies for Our Nation*. Board of Manufacturing and Engineering Design, National Materials Advisory Board, National Academy of Sciences.

2.C Sections or Chapters in Edited Monographs or Similar Volumes

23. Argote, L. Dennome, C. and **Fuchs, E.** 2011. Organization Learning across Boundaries: The Effect of Geographic Distribution on Organizational Learning and Knowledge Transfer. *Handbook on Organizational Learning and Knowledge Management*. Wiley-Blackwell.

24. **Fuchs, E.** 2011. DARPA Does Moore's Law: The Case of DARPA and Optoelectronic Interconnects. Invited chapter in *State of Innovation: The U.S. Government's Role in Technology Development*. Ed. by Fred Block and William Keller. Paradigm Publishers.

25. **Fuchs, E.** 2009. Remembering Comparative Advantage: Leveraging National Differences in Technology Competitiveness. Report by CMU and the Atlantic Council to the G-20 Leaders.

2.D Other Writings (Technical Reports and Testimony)

26. **Fuchs, E.** Why the future of manufacturing matters. Blog. World Economic Forum. September 11, 2013.

27. **Fuchs, E.** (with contributions by J. Andersen, R. Laureijs, J. Chuang, S. Kurup, W. Chang, P. Bissert, K. Chow, C. LaMontagna, and X. Yan) Man or Machine? A Strategic Toolset to Quantify and Accelerate the Economic Viability of U.S. Science and Technology Adaptive Make Capabilities. Year 1 Interim Progress Technical Report. Prepared for the Defense Advanced Research Projects Agency. July 8, 2013.

28. **Fuchs, E**. Help Startups Be Gardens of Innovation. Room for Debate. Should the U.S. Seek More Tech Manufacturing? The Opinion Pages. *The New York Times*. August 6, 2012.

3. Grants and Contracts Awarded to Date

3.A Principal Investigator

1. With co-PI D. Hounshell. RAPID: What Model for Public-Private Partnerships?: Lessons from Existing Consortia for Administration of the U.S. National Network for Manufacturing Innovation. **NSF Science of Science and Innovation Policy Program.** October 2012 – September 2013. $83,974

2. With co-PI D. Hounshell. Beyond SEMATECH as the Model for Public-Private Partnerships: Insights from the Semiconductor Research Corporation (SRC). **National Institute of Standards and Technology (NIST)**. Sept. 2012-Aug. 2015. $311,405.

3. With co-PI J. Michalek. Institutionalizing & Disseminating Engineering Entrepreneurship **Dean's Innovation Across the Curriculum Development Fund. Carnegie Institute of Technology**. Carnegie Mellon University. Sept. 2012 – Aug. 2013. $63,265.

4. Man or Machine? A Strategic Toolset to Quantify and Accelerate the Economic Viability of Emerging U.S. Science & Technology Adaptive Make Capabilities. **Defense Sciences Office (DSO)**, **Defense Advanced Research Projects Agency (DARPA).** Collaborative Grant with the Army Research Office. June 2012 – May 2015. Year 1: $188,034, Year 2: $231,626.

5. Global Entrepreneurship and the Future of Advanced Manufacturing. **Corporate Sponsorship. Ciena Corporation.** $25,000 gift.

6. Global Entrepreneurship and the Future of Advanced Manufacturing. **Corporate Sponsorship. Kennametal Corporation.** $15,000 gift.

7. CAREER: Rethinking National Innovation Systems – Economic Downturns, Offshoring, and the Global Evolution of Technology. **NSF Science of Science and Innovation Policy Program**, May 2011 – May 2016, $624,517.

8. With co-PIs J. Michalek and Y. Liu. GOALI: Think Globally, Act Locally: China and the Future of Energy-Saving Vehicle Technologies. **NSF Science of Science and Innovation Policy Program** and **NSF Grants Opportunities for Academic Liason with Industry (GOALI).** June 2011 – June 2013. $192,816.

9. With co-PIs L. Argote, and D. Epple. Learning Across Product, Workgroup, and Geographic Boundaries, **NSF Science of Science and Innovation Policy** & **Innovation and Organization Science Programs**, January 2010 – January 2013, $707,807

10. The Role of DARPA in Seeding and Encouraging New Technology Trajectories, Robert W. Gore Materials Innovation Case Study Project, **Chemical Heritage Foundation**, June 2009 – May 2010, $9000

11. Quantifying the Resilience of Innovation Ecosystems: The Impact of Manufacturing Offshore on Firm Technology Trajectories and the Institutional Locus of Innovation, **NSF Science of Science and Innovation Program**, September 2008 – September 2010, $208,068; *2009 NSF Research Highlight; August 2010 Feature in SciSIP newsletter*.

12. The Global Disintegration of Firm Activities: Understanding the Managerial and Technological Underpinnings of Firm Outsourcing, **Berkman Faculty Development Fund**, June 2008 – May 2010, $10,000

13. An Innovation Ecosystem in Flux: Innovation Trajectories and Institutional Shifts in the Optoelectronics Industry, **Oak Ridge Associated Universities (ORAU) Ralph E. Powe Junior Faculty Enhancement Award**, June 2008 – May 2010, $10,000

14. The Global Disintegration of Firm Activities: Understanding the Managerial and Technological Underpinnings of Firm Outsourcing, **Sloan Industry Studies Site Visit Grant**, The Sloan Foundation, June 2008 - May 2009, $5000

15. INFORMS session: Knowledge Networks & the Emergence of New Technologies, **Sloan Industry Studies Travel Grant**, Sloan Foundation, Oct. 12-15, 2008, Speakers' travel.

16. Decision Tools for Engineering Design and Entrepreneurship, **Corporate Sponsorship. RHM International**, January 2008 – May 2010, $5000 gift plus all-expense trip for three-student project team to collect data on-site at the company in China (~$10,000).

3.B Co-Principal Investigator

17. PI: Lewandowski, J. Co-PIs: Beuth, J., Fuchs E. plus 15 additional industry, university, and government participants. Rapid Qualification Methods for Powder Bed Direct Metal AM Processes. **National Additive Manufacturing Innovation Institute.**

18. PI: Whitacre, J. Co-PIs: Fuchs, E. and Michalek, J. Manufacturing Modeling Tools for Domestic Energy Storage Production: Process Based Cost Modeling. **Research for Advanced Manufacturing in Pennsylvania.** Industry Partner: Aquion Energy $26,440

19. PI: Veloso, F. E. Fuchs, and J. Michalek, Decision Tools for Engineering Design and Entrepreneurship, Course Outreach to Carnegie Mellon University's Technology Transfer Office, **R.K. Mellon Foundation**, August 2008 – August 2009, $25,000

4. Teaching and Education

4.A Courses Taught at CMU

	Course Title	Units	Class	Offered	Num of Students	Num Resp	FCE Crse*	FCE Instr*
19-411, 19-711	Global Competitiveness	12	Sr/Gr	Fall 14	11	10	4.9	5.0
19-484, 19-784, 24-484, 24-784	Decision Tools for Engineering Design and Entrepreneurship (a)	12	Sr/Gr	Spring 13	49	41	3.8	3.37
19-741	Global	12	Sr, Gr	Spring 12	24	22	4.0	3.9

	Entrepreneurship (b)							
19-411, 19-711, 88-415, 88-615	Global Competitiveness	12	Sr, Gr	Fall 11	20	20	4.9	4.9
19-741	Global Entrepreneurship (b)	12	Sr, Gr	Spring 11	17	15	4.4	4.4
19-611, 84-415, 94-809	Global Competitiveness	12	Sr, Gr	Fall 10	9	8	5.0	5.0
19-484, 19-784, 24-484, 24-784	Decision Tools for Engineering Design and Entrepreneurship (a)	12	Sr/Gr	Spring 10	40	37	3.9	3.8
19-684 84-415 94-809	Global Competitiveness	12	Sr, Gr	Fall 09	19	15	4.5	4.8
19-484, 19-784, 24-484, 24-784	Decision Tools for Engineering Design and Entrepreneurship (a)	12	Sr/Gr	Spring 09	37	31	4.4	4.1
19-611 84-415	Global Competitiveness (b)	12	Sr, Gr	Fall 09	9	4	4.5	4.2
19-484, 19-784, 24-484, 24-784	Decision Tools for Engineering Design and Entrepreneurship (a, b)	12	Sr/Gr	Spring 08	18	16	4.2	3.6

(a) Team taught with Professor Jeremy Michalek, (b) New course
* Faculty Course Evaluations (FCEs) are scored by students on a scale of 1 (worst) to 5 (best).

4.B Student Research Projects

(a) Undergraduate Projects

1. Alexander Lucci, "Accuracy of Hand-matching of patent data using inventor CVs." May 15, 2013 – October 2013.
2. Angela Ng. "Careers of optoelectronic inventors post-bubble," Feb 2012-Aug 2013.
3. Carl Glazer, "Born Global? Start-up location decision-making and the future of advanced manufacturing." January 2012-March 2013. (EPP Tom Johnson and CMU

Summer Undergraduate Research Fellowship recipient for Summer 2012.); "Careers of optoelectronic inventors post-bubble," April 2011-December 2012.

4. Neha Nandakumar, "The quality of inventor disambiguation of patenting algorithms." June 2011-February 2013.
5. Willis Chang, "Process-Based Cost Modeling of the Economic Viability of Gas Turbine Blades for the Aerospace Industry." Fall 2012. "Careers of optoelectronic inventors post-bubble," Fall 2010 - Spring 2011
6. Sabrina Larkin. "Careers of optoelectronic inventors post-bubble," May 2012-August 2012.
7. Stephanie Hsuan Kao. "Predicting career states of optoelectronic inventors in telecommunications firms post-offshoring." September 2011-May 2012.
8. Jane Sun, "Technology directions in monolithic versus hybrid integration photonic patenting," Fall 2010-Spring 2011. January 2012.
9. Derek Lessard, "Careers of optoelectronic inventors post-bubble," Sept-Nov 2011.
10. Farjad Zaim, "Careers of optoelectronic inventors post-bubble," April-August 2011
11. Dan Murby, "Careers of optoelectronic inventors post-bubble," April-May 2011
12. Sandeep Patel, "The Resiliency of the Innovation Ecosystem," Fall 2009-Spring 2010 (became a MISM masters student in Fall 2010.)
13. Jack Wang, "The Relationship between Manufacturing and Jobs," Spring 2010
14. Alex Chrichton, EPP-CMU Patent Inventor Matching System, Spring 2010
15. Peter Pong, "The Resiliency of the Innovation Ecosystem," Fall 2008-Spring 2009
16. Jason Mirra, 'Learning in Geographically Distributed Organizations," Fall 2008
17. Tubtim Eawchoowongse, "Learning in Geographically Distributed Organizations," Fall 2008
18. Luke Kryznowski, "The Role of DARPA in Seeding and Encouraging New Technology Trajectories," Summer 2008

(b) Master's Students

19. Michael Jiang, "Process-Based Cost Modeling of the Economic Viability of Gas Turbine Blades for the Aerospace Industry: Adding Arcam and Stellite" Fall 2013
20. Sangyoung Cho, "Process-Based Cost Modeling of the Economic Viability of Gas Turbine Blades for the Aerospace Industry: Adding Arcam and Stellite" Fall 2013
21. Ria Laureijs, "Process-Based Cost Modeling of the Economic Viability of Gas Turbine Blades for the Aerospace Industry." Fall 2012
22. Jessica Chuang, "Process-Based Cost Modeling of the Economic Viability of Gas Turbine Blades for the Aerospace Industry." Fall 2012
23. Sreeram Kurup Unnikrishna Kurup, "Process-Based Cost Modeling of the Economic Viability of Gas Turbine Blades for the Aerospace Industry." Fall 2012
24. Sandeep Patel, "The Resiliency of the Innovation Ecosystem," Fall 2010
25. Edward Lynch-Bell, "Process-Based Cost Modeling of Stationary Battery Production," Summer 2009 (co-advised with Jay Whitacre).

(c) Ph.D. Students

26. Jeff Anderson. "Man or Machine? A Strategic Toolset to Quantify and Accelerate the Economic Viability of Emerging U.S. Science & Technology Adaptive Make Capabilities" August 2012-August 2013. (Lead Advisor.)

27. Hassan Khan. "Beyond Sematech as the model for public-private partnerships: Insights from the Semiconductor Research Corporation for the administration of the NIST Advanced Manufacturing Technology Consortia Program." (Lead Advisor. Co-advised with David Hounshell.)
28. John Helveston, "Think Globally, Act Locally: China and the Future of Energy Savings Vehicle Technologies" (50-50 co-advised with Jeremy Michalek)
29. Apurba Sakti, "Li-Ion Electric Vehicle Battery Design and Production." March 2011-present. (Co-advisor. Lead advisors: Jeremy Michalek, Departments of Mechanical Engineering and Engineering and Public Policy and Jay Whitacre, Departments of Materials Science and Engineering and Engineering and Public Policy.)
30. Samuel Ventura, "Methods Matter: Revamping Inventor Disambiguation Algorithms with Classification Models and Labeled Inventor Records." June 2010-Present. (Co-advisor. Lead advisor: Rebecca Nugent, Dept. of Statistics)
31. Eyiwunmi Akinsanmi, "The Resiliency of the Innovation Ecosystem: Technology Directions and Productivity During Economic Downturn," August 2009-Present (Lead advisor. Co-advised with Ray Reagans, M.I.T. Sloan School of Management)
32. Chia-Hsuan, "Gains from Others' Losses: Technology Trajectories and the Global Division of Firms," July 2009-Present (Lead advisor. Co-advised with Rebecca Nugent, Dept. Statistics)
33. Carolyn Denomme, "The Benefits of Bounded Diversity: Organizational Learning in a Multi-Product Manufacturing Environment," August 2007-December 2013 (Lead advisor. Co-advised with Linda Argote and Dennis Epple, Tepper School of Business)
34. Timothee Doutriaux, "The Resiliency of the Innovation Ecosystem: The Impact of Offshoring on Firm vs. Individual Technology Trajectories," August 2007-May 2009 (Lead advisor. Co-advised Sept 2008 – Jan 2009 with Francisco Veloso)
35. Matthew Hamilton. "The Cooperative Role of Formal and Informal Institutions in Regional Innovation Systems." August 2007-August 2008 (Dissertation Committee Member.)

(d) Post-Doctoral Students

36. Carolyn Denomme, "The Benefits of Bounded Diversity: Organizational Learning in a Multi-Product Manufacturing Environment," January 2013-present (Lead advisor. Co-advised with Linda Argote and Dennis Epple, Tepper School of Business)

4.C Educational Contributions

Since arriving at CMU, I have developed three new classes. The first – Decision Tools for Engineering Design and Entrepreneurship, co-taught with Jeremy Michalek (Dept. Mechanical Engineering) – teaches students a computational modeling toolset with which to assess the economic viability of a new technology prior to large-scale investment. For Spring 2008, we received $5000 in course sponsorship and approximately $10,000 in student travel funds from RHM International, a company commercializing technology originating in the Chinese Academy of Sciences. The three students on the RHM team spent spring break collecting data for their project at the company's manufacturing facility in China. At the end of the term, the company offered jobs to all three students, two of whom are now in permanent

positions at the company's headquarters in China. In Spring 2009, we received $25,000 from the R.K. Mellon Foundation to bring into our course emerging technology projects from Carnegie Mellon's Center for Technology Transfer. At the end of this second year, two students received job offers as a direct consequence of the course, and four CMU-based start-ups are now using the students' models and technology assessments in their business plans. These four start-ups are nanoGriptech™ (founded by Professor Metin Sitti), 44Tech™ (founded by Professor Jay Whitacre), a company seeking to commercialize nanofiber air filters for respirator systems (led by CMU post doctoral student Amrinder Nain), and a company seeking to create new home energy monitoring solutions (led by CMU undergraduate student Ethan Goldman). In Spring 2010, we continued to work closely with the CMU Center for Technology Transfer. In this year, company involvement continued to expand such that all eight of the projects were supported by real-world start-ups, with seven of the eight projects involving technologies developed at CMU. In spring 2013 the course completed its fourth year. In this fourth year, DTEDE had nine sponsored real-world technology commercialization projects and just shy of fifty students.

My second new course – Global Competitiveness: Firms, Nations, and Technological Change – introduces students to the historical and contemporary intellectual foundations from economics, sociology, and political science of our current understandings of national innovation systems and technological change. It is now an approved elective in many of the innovation curricula, including CIT's masters program in E&TIM and H&SS's new undergraduate minors in Innovation, Entrepreneurship, and Economic Development (IEE) and Global Politics, Science, and Technology (GPST). In fall 2012, it completed its fifth year.

My third new course – Global Entrepreneurship and the Future of Advanced Manufacturing – had its inaugural term in Spring 2011. This project course was executed in collaboration with the Science and Technology Policy Institute (STPI) of the Institute of Defense Analysis. Working with real-world start-ups, students developed computational production models to quantify the technical developments necessary for four "green" technologies – one each in fuel cells, stationary grid batteries, solar cells, and environmental sensors – to become economically viable in today's marketplace. They then interviewed firms industry-wide in the same technical space and compared the economic viability of manufacturing their team's "green" technology in the United States according to their computational models, with the companies' stated reasons for their manufacturing location. They conclude their final reports with an analysis of the economics versus other forces influencing manufacturing location decisions. Outcomes from the class may be used by STPI to inform future manufacturing policy in the United States. In it's second year, 2012, Global Entrepreneurship consisted of five projects, three of which were CMU-related start-ups – Aquion Energy, nanoGriptech, and RE-Squared – and two of which were outside corporate sponsors – Ciena Corporation and Kennametal, Inc. Together the corporate sponsors contributed $40,000 in gift funding to run a real-world project in the course. All three of the CMU start-ups are using the modeling to support U.S.-based manufacturing scale-up decisions. Both outside companies plan to make manufacturing and/or acquisition decisions based on the students' analyses.

Finally, in Spring 2009 I taught and participated in the weekend course *China Today*, held jointly by the University of Pittsburgh and CMU. This course was attended by students, faculty, and staff from both CMU and University of Pittsburgh, as well as by K-12 teachers receiving credit for continuing education.

5. Professional Activities

5.A Seminars and Conference Presentations

1. Why the global redistribution of manufacturing matters for the future of products. Invited International Lecturer and Scholar. China's Innovation Circles and Academy – A Network on Learning, Innovation, and Competence Building Systems (CICALICS Academy) Research Center for Technological Innovation and China Institute for Science and Technology Policy. Tsinghua University. Beijing, China. August 27-31, 2014

2. Is there a role for the State in influencing the direction of innovation?: Lessons from the Defense Advanced Research Projects Agency and the Semiconductor Research Corporation for technologically-nuanced R&D policies. Invited International Lecturer and Scholar. China's Innovation Circles and Academy – A Network on Learning, Innovation, and Competence Building Systems (CICALICS Academy) Research Center for Technological Innovation and China Institute for Science and Technology Policy. Tsinghua University. Beijing, China. August 27-31, 2014

3. Shedding New Light into Inventor Disambiguation with Classification Models and Labeled Inventor Records. Annual Meeting of the Academy of Management, Philadelphia, PA, August 3-5, 2014.

4. Will Subsidies Drive Electric Vehicle Adoption?: Measuring Consumer Preferences in the U.S. and China. Business Policy and Strategy Division Symposium. Annual Meeting of the Academy of Management, Philadelphia, PA, August 3-5, 2014. (Presented by J. Helveston)

5. Seeing rainbows while others flee: how innovation in the most advanced technology grew after the burst of the telecommunications bubble. Cross-Division Symposium (Technology Innovation Management, Behavior Policy and Strategy, Organization and Management Theory) Annual Meeting of the Academy of Management, Philadelphia, PA, August 3-5, 2014. (Presented by E. Akinsanmi)

6. A new role for public-private partnerships in long-term technology development?: Insights from the nanoelectronics research initiative. Industry Studies Association Annual Conference in Portland, OR, May 28-30, 2014. (Presented by H. Khan)

7. Seeing rainbows while others flee: how innovation in the most advanced technology grew after the burst of the telecommunications bubble. Industry Studies Association Annual Conference in Portland, OR, May 28-30, 2014. (Presented by E. Akinsanmi)

8. Bought but not played with: Acquisitions and dormant technology opportunities. Industry Studies Association Annual Conference in Portland, OR, May 28-30, 2014. (Presented by C. Yang)

9. Seeing rainbows while others flee: how innovation in the most advanced technology grew after the burst of the telecommunications bubble. Wharton Technology & Innovation Conference. Philadelphia, PA. April 11-12, 2014 (Presented by E. Akinsanmi)

10. Why not all technologies are made equal when it comes to the internationalization of research. Panelist on "Future Trends." Understanding Research Globalization in the Context of National Security and Prosperity. Government-University-Industry Research Roundtable (GUIRR). National Academy of Sciences. Washington, D.C. October 22, 2013.

11. Comparing consumer preferences for electrified vehicles in China and the U.S. INFORMS Annual Meeting. October 9, 2013. (Presented by J. Helveston)

12. Why the shift in manufacturing matters for the global future of technology. Strategic Shifts in Manufacturing Ecosystems. World Economic Forum Summer Davos. September 10, 2013.

13. Methods Matter: Rethinking USPTO Inventor Disambiguation Algorithms with Classification Models and Labeled Inventor Records. Academy of Management Annual Meeting. August 13, 2013.

14. Comparing consumer preferences for electrified vehicles in China and the U.S. Industry Studies Association Annual Meeting. May 29, 2013. (Presented by J. Helveston)

15. Why and Which Manufacturing Matters: Innovation and Production in the U.S. Keynote Speaker. Global Midwest Alliance. Innovation and Opportunities for Manufacturers, Additive Manufacturers, and Global Production. Industry Focus Series: Manufacturing Sector Technology Innovation, Growth, and Globalization. Chicago, IL. April 3, 2013

16. Methods Matter: Revamping Inventor Disambiguation Algorithms in the USPTO Database. Research in Engineering Entrepreneurship Roundtable (REER). Atlanta, GA. November 9, 2012. (Presented by S. Ventura)

17. On the relationship between manufacturing and innovation: why not all technologies are created equal. Invited Seminar. Technology and Operations Management. Harvard Business School. Cambridge, MA. November 1, 2012.

18. Gains from Other's Losses: Technology Trajectories and the Global Division of Firms. INFORMS Annual Meeting. Phoenix, AZ. October 17, 2012. (Presented by C. Yang)

19. The Mobility of Scientists after an Economic Downturn and Its Impact on Technology Trajectories. INFORMS Annual Meeting. Phoenix, AZ. October 17, 2012. (Presented by E. Akinsanmi)

20. The Benefits of Bounded Diversity: Organizational Learning in a Multi-product Manufacturing Environment. INFORMS Annual Meeting. Phoenix, AZ. October 17, 2012. (Presented by C. Denomme)

21. On the relationship between manufacturing and innovation: why not all technologies are created equal. Invited Seminar. University of California San Diego. San Diego, CA. October 12, 2012.

22. What should be made in America? What role, if any, is there for government in U.S. manufacturing? CONNECT Business Forum in partnership with Industrial Relations / Political Science, CONNECT Institute, Sponsored by Sheppard Mullin. San Diego, CA. October 11, 2012.

23. On the relationship between manufacturing and innovation: why not all technologies are created equal. Plenary Speaker. Science of Science and Innovation Principle Investigator's Workshop. Committee on National Statistics. Division of Behavioral and Social Sciences and Education. The National Academies. Washington, D.C. September 20-21, 2012.

24. On the relationship between manufacturing and innovation: why not all technologies are created equal. Keynote Speaker. Materials and Manufacturing Technologies Branch Offsite Meeting. Army Research Laboratory. Auberdeen, MD. August 23, 2012.

25. Gains from Other's Losses: Technology Trajectories and the Global Division of Firms. Annual Academy of Management Meeting. Boston, MA. August 6, 2012. (Presented by C. Yang)

26. Methods Matter: Revamping Inventor Disambiguation Algorithms in the USPTO Database. Annual Academy of Management Meeting. Boston, MA. August 3, 2012. (Presented by S. Ventura)

27. Gains from Other's Losses: Technology Trajectories and the Global Division of Firms. Annual Industry Studies Meeting. Pittsburgh, PA. May 31, 2012. (Presented by C. Yang)

28. The Mobility of Scientists after an Economic Downturn and Its Impact on Technology Trajectories. Annual Industry Studies Meeting. Pittsburgh, PA. May 31, 2012. (Presented by E. Akinsanmi)

29. Methods Matter: Revamping Inventor Disambiguation Algorithms in the USPTO Database. Annual Industry Studies Meeting. Pittsburgh, PA. May 30, 2012. (Presented by S. Ventura)

30. Organizational Learning and Knowledge Transfer in a Multi-Product Overseas Manufacturing Environment. Annual Industry Studies Meeting. Pittsburgh, PA. May 30, 2012. (Presented by C. Denomme)

31. Gains from Others Losses: Technology Trajectories and the Global Division of Firms. Wharton Technology Conference. Philadelphia, PA. April 20-21, 2012.

32. On the relationship between manufacturing and innovation: why not all technologies are created equally. Invited Seminar. Production in the Innovation Economy Series. M.I.T. Cambridge, MA. April 4, 2012.

33. The Future of Advanced Manufacturing: Insights from Optoelectronics and Beyond. Manufacturing Workshop. Optoelectronics Industry Development Association. OFC/NFOEC. Los Angeles, CA. March 5, 2012.

34. What manufacturing should we really be keeping in the U.S.?: The relationship between manufacturing and innovation and why U.S. policy cannot treat all technologies equally. Forum on *Why – and Which – Manufacturing Matters*. Brookings Institution. Washington, D.C. February 22, 2012.

35. Economic Downturns, Technology Trajectories, and the Careers of Scientists. INFORMS Annual Meeting. Charlotte, North Carolina. November 14, 2011. (Presented by E. Akinsanmi)

36. Rethinking the Role of Government in Technology Development: DARPA and the Case for Embedded Network Governance. Leaders Program. 21st New Generation Seminar. East-West Center. Washington, D.C. October 14, 2011.

37. Reflections on an Interdisciplinary Ph.D. Academic Panel. M.I.T. Engineering Systems Division First 50 Ph.D.s Alumni Symposium. September 16, 2011.

38. The Future of Photonics: Implications from and for Telecommunications. Finisar Corporation. Santa Clara, CA. June 16, 2011.

39. Economic Downturns, Technology Trajectories, and the Careers of Scientists. Industry Studies Association Annual Meeting. Pittsburgh, PA. June 1-2, 2011. (Presented by E. Akinsanmi)

40. The Impact of Offshoring on Firm versus Individual Technology Trajectories. Industry Studies Association Annual Meeting. Pittsburgh, PA. June 1-2, 2011. (Presented by C. Yang)

41. Rethinking Distributed R&D Management: DARPA and the Case for Embedded Network Governance. Intel Corporation. Video Conference to Santa Clara, CA. May 26, 2011.

42. Concluding Comments. Workshop on the Department of Defense as a catalyst for energy technology innovation. Consortium for Science, Policy & Outcomes. Washington, D.C. May 25, 2011.

43. Economic Downturns, Technology Trajectories, and the Careers of Scientists. Production and Operations Management Society (POMS) Annual Meeting. Reno, NV. April 30, 2011. (Presented by E. Akinsanmi)

44. The Future of Photonics: Implications from and for Telecommunications. National Research Council. Harnessing Light II. Second Committee Meeting. Washington, D.C. April 7, 2011.

45. The Impact of Offshore Manufacturing on Technology Competitiveness: Implications for U.S. Policy. Connect Innovation Institute. San Diego, CA. April 27-28, 2011.

46. The Impact of Offshore Manufacturing on Technology Competitiveness: Implications for U.S. Policy. Invited Briefing. Secretary Gary Locke. National Advisory Council on Innovation and Entrepreneurship. Department of Commerce. December 8, 2010.

47. The Impact of Offshore Manufacturing on Technology Competitiveness: Implications for U.S. Government Investment. Invited Seminar. ARPA-E. December 8, 2010.

48. The Future of Photonics: Implications From and For the Telecommunications Industry. Invited Talk. Optoelectronics Industry Development Association Annual Forum. November 16. 2010.

49. Economic Downturns, Technology Trajectories, and the Careers of Scientists. INFORMS Annual Meeting. Austin, TX. November 10, 2010. (Presented by E. Akinsanmi)

50. The Impact of Offshoring on Firm versus Individual Technology Trajectories. INFORMS Annual Meeting. Austin, TX. November 6, 2010. (Presented by C. Yang)

51. The Impact of Offshoring on Innovation: Implications for U.S. Policy. AAAS Science and Policy Programs NSF SciSIP Grantees Workshop: Towards a Community of Practice. Washington, D.C. October 19, 2010

52. Rethinking the Role of Government in Technology Development: DARPA and the Case for Embedded Network Governance. Global Innovation and Development Lecture Series. The Nunn School of International Affairs. Georgia Institute of Technology. September 14, 2010

53. Rethinking the Role of Government in Technology Development: DARPA and the Case for Embedded Network Governance. China Institute for Science and Technology Policy. School of Public Policy. Tsinghua University. August 17, 2010

54. Rethinking the Role of Government in Technology Development: DARPA and the Case for Embedded Network Governance. Defense Advanced Research Projects Agency (DARPA). Washington, D.C., June 7, 2010

55. The Impact of Manufacturing Offshore on Technology Competitiveness. Stanford University, Social Science and Technology Seminar Series. Stanford, CA. June 2, 2010.

56. Design for Location: The Impact of Manufacturing Offshore on Technology Competitiveness in the Optoelectronics Industry. Sumantra Ghoshal Strategy Conference. London, U.K. May 16, 2010.

57. Moore's Law, Technology Mafias, and Radical Architectural Change. Industry Studies Association Annual Conference. May 6, 2010.

58. Organizational Learning in a Multi-Product Overseas Manufacturing Environment. Industry Studies Association Annual Conference. May 6, 2010. (Presented by C. Denomme)

59. The Impact of Product Mix and Employee Turnover on Organizational Learning. Organization Science Winter Conference. Steamboat Springs, CO. February 4-7, 2010.

60. The Impact of Manufacturing Offshore on Innovation: Implications for U.S. Policy. Information Technology Innovation Foundation Forum. Rayburn Office Building, United States House of Representatives. Washington, D.C. February 3, 2010.

61. The Impact of Manufacturing Offshore on Technology Competitiveness: Implications for U.S. Policy. Science Technology Policy Institute Seminar Series. Institute for Defense Analysis. Washington, D.C. February 2, 2010.

62. The Impact of Manufacturing Offshore on Technology Competitiveness. Engineering, Science, and Technology Policy (ESTeP) Committee Meeting. Photonics West. SPIE. San Francisco, CA. January 25-27, 2010.

63. The Impact of Manufacturing Offshore on Technology Competitiveness. Invited Talk. M.I.T. Sloan Technology Innovation and Entrepreneurship Seminar. Cambridge, MA. December 7, 2009.

64. From Ph.D. to Prof. (In Under 20 Minutes). Invited Talk. M.I.T. Course on Academic Careers: ESD.944. Cambridge, MA. December 24, 2009.

65. The Impact of Employee Turnover and Product Mix on Organizational Learning in Offshore Manufacturing. INFORMS Annual Meeting. San Diego, CA. October 11, 2009. (Presented by C. Denomme)

66. Design for Location: The Impact of Manufacturing Offshore on Technology Competitiveness. Atlanta Conference on Science and Innovation Policy. Atlanta, GA. October 2-3, 2009

67. Rethinking the Role of the State in Technology Development: The Case of DAPRA and Embedded Network Governance. Atlanta Conference on Science and Innovation Policy. Atlanta, GA. October 2-3, 2009

68. Remembering Comparative Advantage: Leveraging National Differences in Technology Competitiveness. Conference by CMU and the Atlantic Council in Preparation for the G-20 Summit. Pittsburgh, PA. September 23, 2009

69. The Impact of Manufacturing Offshore on Technology Competitiveness: Implications for U.S. and China Policy. The Cosmos Club. Washington, D.C. September 10, 2009

70. Rethinking the Role of the State in Technology Development: The Case of DAPRA and Embedded Network Governance. Annual Meeting of the Academy of Management. Chicago, IL. August 7-11, 2009

71. Rethinking the Role of the State in Technology Development: The Case of DAPRA and Embedded Network Governance. International Risk Governance Society. Washington, D.C., June 30, 2009

72. The Impact of Manufacturing Offshore on Technology Competitiveness: Lessons from Automobiles and Semiconductors. Algorithmic Automation Workshop. Robotics Science and Systems 2009. Seattle, WA. June 28, 2009

73. The Impact of Employee Turnover and Product Mix on Organizational Learning in Offshore Manufacturing. Interactive Session. Sloan Industry Studies Annual Meeting. May 28, 2009. (Presented by C. Denomme)

74. Emerging Trends in Organization Science: Commentary on Common Themes. Organization Science Senior Editors Conference. Pittsburgh, PA. May 22, 2009

75. Design for Location: The Impact of Manufacturing Offshore on Technology Competitiveness. AAAS. Workshop on Science of Science and Innovation Policy. Washington, D.C. March 24, 2009

76. The Impact of Manufacturing Offshore on Technology Competitiveness: Implications for U.S. and China Policy. China Today. University of Pittsburgh. Pittsburgh, PA. March 20-22, 2009

77. The Impact of Manufacturing Offshore on Technology Competitiveness: Implications for U.S. and China Policy. Development Students Organization. Carnegie Mellon University. Pittsburgh, PA. March 20, 2009

78. The Role of DARPA in Seeding and Encouraging New Technology Trajectories: Pre- and Post Tony Tether in the Innovation Ecosystem. Chemical Heritage Foundation. Philadelphia, PA. February 27, 2009

79. The Geography of Design: Lessons from Automobiles and Optoelectronics. Center for Product Strategy and Innovation. Corporate Members Meeting. Pittsburgh, PA. Feb. 18, 2009

80. The Role of DARPA in Seeding and Encouraging New Technology Trajectories: Pre- and Post Tony Tether in the Innovation Ecosystem. Council on Foreign Relations. New York, NY. November 25, 2008

81. Modeling the Economics of Photonics Manufacturre: Strategic Trade-offs in Integration, Offshoring, and Material Platforms. Workshop on 10GPON, MIT Center for Integrated Photonics, Cambridge, MA, November 18, 2008

82. The Geography of Design: Lessons from Automobiles and Optoelectronics. Center for Product Strategy and Innovation, CMU, Pittsburgh, PA. November 11, 2008

83. The Global Competitiveness Lab: The Impact of National Diversity on Technology Change. Department of Engineering and Public Policy, CMU, Pittsburgh, PA. October 24, 2008

84. The Role of DARPA in Seeing and Encouraging New Technology Trajectories: Pre- and Post Tony Tether in the Innovation Ecosystem. Information Technology and Innovation Foundation. Washington, D.C. October 14, 2008

85. The Role of DARPA in Seeing and Encouraging New Technology Trajectories: Pre- and Post Tony Tether in the Innovation Ecosystem. INFORMS Annual Meeting, Washington, D.C. October 13, 2008

86. The Role of DARPA in Seeing and Encouraging New Technology Trajectories: Pre- and Post Tony Tether in the Innovation Ecosystem. Panel on Science and Technology Policy. Annual Meeting of the Society for the Advancement of Socio-Economic Research (SASE). San Jose, Costa Rica. July 21-23, 2008

87. Modeling the Economics of Photonics Manufacturre: Strategic Trade-offs in Integration, Offshoring, and Material Platforms..Integrated Photonics & Nanophotonics Research Applications Topical Meeting, Optical Society of America. Boston, MA, July 13-16 2008

88. The Role of DARPA in Seeing and Encouraging New Technology Trajectories: Pre- and Post Tony Tether in the Innovation Ecosystem. Sloan Industry Studies Annual Meeting. Boston, MA. April 30, 2008

89. The Impact of Manufacturing Offshore on Technology Competitiveness. Innovation and Manufacturing in the 21st Century. Optoelectronics Industry Development Association. San Jose, CA. April 16-17, 2008

90. Platform Leaders, True Believers, and Coordinated Innovation: The Role of Key Architects in Influencing Technology Trajectories. INFORMS Annual Meeting 2007 Seattle, WA, November 4-7, 2007

91. Modeling the Economics of Photonics Manufacture: Strategic Trade-Offs in Integration, Offshoring, and Materials Platforms. Invited Talk. Photonics North. Ottawa, Canada, June 4-7, 2007

92. Changing Paths: The Impact of Manufacturing Offshore on Technology Trajectories. Sloan Industry Studies Annual Conference. Cambridge, MA April 26-27, 2007.

93. Moore's Law: Platform Leaders, True Believers, and Coordinated Innovation – Implications for the Upcoming Decade. Bi-Annual Microphotonics Center Industry Consortium Meeting. April 17-18, 2007

94. Innovation Strategies for a Global Economy: The Role of DARPA in Seeding and Encouraging Technology Trajectories. Invited Seminar. Engineering and Public Policy. Carnegie Mellon University. Pittsburgh, PA, December 18, 2006

95. The Impact of Manufacturing Off-shore on Technology Trajectories. Invited Presentation. INFORMS Annual Meeting 2006 Pittsburgh, PA, November 5-8, 2006

96. Innovation Strategies for a Global Economy: The Role of Government Initiatives in Technology Trajectories. Bi-Annual Microphotonics Center Industry Consortium Meeting. October 19-20, 2006

97. The Geography of Design: Insights from Automobile Bodies and Optoelectronic Components. Invited Presentation. TMS Annual Meeting. Materials Science & Technology 2006. Cincinnati, OH, October 15-19, 2006

98. Modeling Photonics Manufacture: Economic Insights into Design, Process, and Production Strategy. Invited Talk. Optoelectronics Industry Association Forum – Micropackaging for the Next Generation of Optical and Electrical Components. San Jose, CA, August 30, 2006.

99. Innovation Myopia: Beyond Labor Savings in Off-shore Manufacturing. The Innovation Research Network. Boston, MA, May 13, 2006

100. Innovation Myopia: Beyond Labor Savings in Off-shore Manufacturing. Invited Seminar. Engineering and Public Policy. Carnegie Mellon University. Pittsburgh, PA, March 8, 2006

101. Innovation Myopia: Beyond Labor Savings in Off-shore Manufacturing. Technology and Operations Management Seminar. Harvard Business School. Harvard University. Pittsburgh, PA, February 23, 2006

102. Innovation Myopia: Beyond Labor Savings in Off-shore Manufacturing. Operations Management Seminar. Sloan School of Management. Massachusetts Institute of Technology. Cambridge, MA, February 16, 2006

103. Changing Paths: The Impact of Manufacturing Off-shore on Technology Development Incentives. Invited Presentation. INFORMS Annual Meeting 2005 New Orleans, November 13-16, 2005

104. Challenges for Emerging Technologies in Mature Industries: The Case of Polymer Composite Vehicles in China. Panel on The Future of the Car – The Car of the Future. M.I.T. International Science and Technology Initiative. Cambridge, MA, September 22, 2005

105. Innovation Myopia: Beyond Labor Savings in Off-shore Manufacturing. 4th Annual Technology Management and Policy Consortium. Cambridge, MA, June 26-28, 2005

106. Modeling Photonics Manufacture: Economic Insights into Design, Process, and Production Strategy. Invited Presentation. Intel Corporation. Santa Clara, CA, June 5, 2005

107. Structural Shackles: The Importance of Maintaining a Problem-Oriented Approach in the Early Development Stages of Engineering Systems. Student Panel. Engineering Systems Division Department Off-site. Dedham, MA, May 27, 2005

108. Modeling Photonics Manufacture: Economic Insights into Design, Process, and Production Strategy. Microphotonics Center Industry Consortium Meeting. May 16, 2005

109. Consolidate? Integrate? Go East? Or Get Out?: Mapping the Drivers of Optoelectronics Production Costs. Photonic Systems Graduate Series, M.I.T. Center for Integrated Photonics, Cambridge, MA, March 17, 2005

110. Device-Enabled Network Architectures: The Economic Implications of Emerging Optoelectronic Device Technologies in Network Architectures. M.I.T. Communications Futures Program. Cambridge, MA, March 16, 2005

111. Consolidate? Integrate? Go East? Or Get Out?: Mapping the Drivers of Optoelectronics Production Costs. Bi-Annual Microphotonics Center Industry Consortium Meeting. Cambridge, MA, December 4, 2004

112. Process-Based Cost Modeling of Photonics Manufacture. Bi-Annual Microphotonics Center Industry Consortium Meeting. Cambridge, MA, November 3, 2003

113. The Significance of Production Cost Inputs in Regional Technology Choice: Composite Automotive Body-In-Whites in the U.S. versus China. 2nd Annual Technology Management and Policy Consortium. Arlington, VA, July 7-8, 2003

5.B Government Committees, Civic Appointments, and Board Memberships

Member-at-Large. U.S. Advisory Committee to the International Commisssion for Optics. The National Academies. International Council for Science. February 14, 2013 – December 31, 2015

General Committee Member; Chair, Subcommittee for the Chapter on Economic Impact. National Research Council Committee on *Harnessing Light: Capitalizing on Optical Science Trends and Challenges for Future Research*. Board of Manufacturing and Engineering Design, National Materials Advisory Board, National Academy of Sciences. February 2011 – July 2012.

Participant. National Academies of Engineering. Invitation-Only Workshop. *Making Value: Integrating Manufacturing, Design, and Innovation to Thrive in the Changing Global Economy.* Washington, D.C. June 11-12, 2012.

Member. Committee of Visitors. Science of Science and Innovation Policy Program 3-year Review. National Science Foundation. Washington, D.C. December 15-16, 2011

Invited 30-minute brief on the future of advanced manufacturing to Secretary Gary Lock's National Advisory Committee on Innovation and Entrepreneurship. Department of Commerce. December 8, 2010.

One of 23 Invited Participants. President's Council of Advisors on Science and Technology (PCAST) Advanced Manufacturing "Discussion Workshop". Led by PCAST members Eric Schmidt, Chairman and CEO of Google, Inc. and Shirley Ann Jackson, President of Rensselaer Polytechnic Institute. Washington, D.C. March 19, 2010.

5.C Membership and Activities in Honorary Organizations, Professional Societies

Activities:

Panel Member. Review of 2011 grant submissions. Science of Science and Innovation Policy Program. National Science Foundation. December 8-9, 2012

Advisor. Photonics community letter to the President's Council of Advisors on Science and Technology and the Office of Science and Technology Policy: "Recommendations for Federal Support of Photonics to Advance U.S. Manufacturing, April 19, 2010." Initiated and created the first draft of the letter. Revisions and completion of the letter were subsequently led by SPIE (International Society for Optics and Photonics). The letter was signed by all three of the major photonics professional society presidents.

Committees:

Member. SPIE (International Society for Optics and Photonics) Data Collection Task Force. Goal: Providing recommendations to the National Academies on their plans for a revised edition of the 1998 publication, Harnessing Light: Optical Science and Engineering for the 21st Century

Membership:

1. INFORMS
2. Academy of Management
3. Industry Studies Association

5.D Editorial Roles on Publications, Major Activities in Professional Meetings

Advisory Editor (and Advisory Board Member), *Research Policy*, April 2014-April 2017

Ad-hoc Reviewer:

Journals –

Management Science
Organization Science
Research Policy
Journal of Policy Analysis and Management
Industry and Innovation
International Journal of Production Economics
Management Science and Operations Management (MSOM)
Research in Engineering Design

Conferences –

Atlanta 2009 Conference on Science and Technology Policy (Globalization Track)

By Special Invitation –

Atkinson, R. and Wial, H. Boosting Productivity, Innovation, and Growth through a National Innovation Foundation. Blueprint for American Prosperity. Brookings Institution. Oct. 2007

Rising to the Challenge: U.S. Innovation Policy for the Global Economy. Ed. Wessner, C. National Research Council. Policy and Global Affairs Division. National Academies Press. February 15, 2012 – May 29, 2012.

Activities in Professional Meetings:

Committee Member:

Member. Industry Studies Early Career Development Committee. May 2011 – May 2013. Participant in best dissertation award decision and organization of Industry Studies Annual Early Career Professional Development Workshop.

Founder, Industry Studies Association "Rising Stars" Best Paper Award. Ran inaugural year (2013) competition, worked with the Industry Studies Association board to determine the call for submissions, recruited the award panel to select winners, and arranged the special 2013 session at which the winner and runners up would present with guest discussant.

Committee Member:

Best Paper Committee, Technology and Innovation Management (TIM) Division, 2011 Annual Academy of Management (AOM) Conference

Committee Chair (Inaugural Year):

Best Paper Award, Technology Management Division, INFORMS 2012 Annual Meeting

Best Dissertation Award Reviewer:

Technology Management Division, INFORMS 2010 Annual Meeting.

Session Chair:

INFORMS 2012 Annual Meeting: Technology Management Division Best Paper Session
INFORMS 2011 Annual Meeting. Technology Management Division
INFORMS 2010 Annual Meeting. Technology Management Division
INFORMS 2009 Annual Meeting. Technology Management Division
INFORMS 2008 Annual Meeting. Technology Management Division. P.I. on Sloan Travel Grant to cover flight and hotel expenses for all '08 session speakers.
INFORMS 2007 Annual Meeting. Technology Management Division.

5.E Service on CMU Committees

2013-present	Chair, Faculty Search Committee. Faculty Hire in the Management, Economics, or Organization of Technology. Department of Engineering and Public Policy
2012-present	Founder and Organizer. Carnegie Mellon University STEM Junior Women Faculty Lunches (three times per year – paid for by the STEM deans.)
2008-present	Admissions Committee Member. Engineering and Technology Innovation Management Masters Program, Department of Engineering and Public Policy
2013-2014	Member, Department Head Search Committee. Department of Engineering and Public Policy.

2011-2013 First-round Ph.D. admissions reviewer. "Other Technology Policy," "International" and "Strategy, Entrepreneurship, and Technological Change" Ph.D. Applicant Categories. Department of Engineering and Public Policy.

2008-2013 Graduate Education Committee Member. Ph.D. Program. Department of Engineering and Public Policy.

2008-2013 Co-organizer. Junior Faculty Rotating Home Get-togethers. Department of Engineering and Public Policy

2008-2013 Co-organizer. Carnegie Institute of Technology Women's Monthly Junior Faculty Lunches

2011-2012 Member. CMU committee supporting the Advanced Manufacturing Partnership "Policy Workstream" (Chaired by President Jared Cohen and Prof. Gary Fedder.)

2011-2012 Member. Ad-Hoc Carnegie Institute of Technology (CIT) Committee on ways to enhance CIT undergraduate education in the areas of innovation and internationalization.

2008-2010 Seminar Coordinator. Strategy Entrepreneurship and Technological Change (SETChange) B-Monthly Seminar

6. Awards, Prizes, Honors

2013 Carnegie Institute of Technology Dean's Early Career Fellow (honorary $10,000/year in discretionary funding for three years)

2012 World Economic Forum Young Scientist (top 40 under 40; in conjunction with the International Academies Panel)

2012 Lead, One of three example projects that together created the body of the winning "Tech Belt" National Additive Manufacturing Innovation Initiative (NAMMI) Proposal; "Tech Belt" – which involves over 30 entities (university, industry, and government) from the Ohio-Pennsylvania-West Virginia region – was the winning proposal nationally, to be awarded $30 million in federal funding to be matched by another $40 million from the consortium; Example project title: E. Fuchs, S. Smith, (CMU); D. Frangepol, E. Zimmers (Lehigh U.); T Harrison, PSU) Computational Models to Guide and Accelerate Commercialization.

2011 Greeted President Barack Obama on behalf of Carnegie Mellon University along with Carnegie Mellon President Jared Cohon during President Obama's visit to announce the Advanced Manufacturing Partnership. Provided a brief synopsis of my offshoring research.

2011 National Science Foundation (NSF) Faculty Early Career Development (CAREER) Award

2010 SPIE (Society for the Advancement of Light) 2010 "Women in Optics"

2010 Participant, President's Council of Advisors on Science and Technology (PCAST) Workshop on the Future of Advanced Manufacturing in the U.S.

2008 Oak Ridge Associated Universities Ralph E. Powe Junior Faculty Enhancement Award

2006 Finalist, Sloan Industry Studies Dissertation Award

2005-2006 Alfred P. Sloan Industrial Performance Center Fellowship

2005 Best Doctoral Presentation, 4th Annual Technology Management and Policy Consortium

2004 Anthony Sun Fellowship

2003 Best Masters Thesis, MIT Technology and Policy Program

7. Press

On The Future of Advanced Manufacturing:

Rotman, D. Can We Build Tomorrow's Breakthroughs? Feature Article. *Technology Review*. January/February 2012.

Bobkoff, Dan. Manufacturing group looks to spur innovation. Marketplace Morning Report. National Public Radio (NPR). Friday, October 14, 2011.

Bobkoff, Dan. What is Advanced Manufacturing and Why is it The Future? Changing Gears. National Public Radio (NPR). September 30, 2011.

Rotman, D. Location Matters in Manufacturing. Business Section. *Technology Review Online*. July 22, 2011. http://www.technologyreview.com/business/37956/

American Society for Engineering Education (ASEE) Newsletter. Study Emphasizes Importance of Location to Manufacturing. July 22, 2011.

Interview with KDKA's Jon Delano on the Sunday Biz Page. KDKA-TV, CBS Pittsburgh. June 30, 2011

On Emerging Research Trends in Science and Innovation Policy:

Lane, J. "Feature" article highlighting our design for location research. Annual Science of Science and Innovation Policy newsletter (only grant recipient highlighted), August 2010.

Lane, J. *Science*. Policy Forum. June 5, 2009

On DARPA Pre- and Post- Tony Tether:

Matthews, Bill. *Defense News*. February 13, 2009.

Reppert, Barton. *IEEE Today's Engineer*. November 8, 2008.

Norr, Melissa. *Computing Research Association's Policy Blog*. October 14, 2008.

On Decision Tools for Engineering Design and Entrepreneurship:

Swaney Chris. *The Piper Newsletter*. June 2008.

On Professional Achievement:

Luttrell, Sharron. Understanding how manufacturing location impacts technology development. *Technology Review*. April 2014.

Silmore, Melissa. Global Partners. Feature Stories. *Carnegie Mellon Today*. January 2014.

M.I.T. Engineering Systems Division Department Brochure: Research Spotlight. 2008.