

## CONTACT DETAILS

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YOUTUBE: <http://youtube.com/riskbites>

WEB: <http://2020science.org>

TWITTER: @2020science

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## **PROFILE**

Andrew Maynard is a Professor in the School for the Future of Innovation in Society at Arizona State University, and Director of the Risk Innovation Lab. His research and professional activities focus on risk innovation, and the responsible development and use of emerging technologies. He is especially interested in novel approaches to understanding and addressing risk; effective approaches to developing socially responsive, responsible and beneficial technologies; understanding and responding to the increasingly complex couplings between converging technologies and society; and effective science communication and engagement – particularly through social media. Through the ASU Risk Innovation Lab, he is exploring novel ways of understanding, thinking about and acting on risk from an entrepreneurial and innovation perspective. He is interested in understanding how risk as a “threat to value” shapes evolving risk landscapes around emerging technologies – especially where the value under threat is social, cultural and personal – and how creativity and serendipity can reveal new approaches to navigating these landscapes.

Andrew is widely published in the academic press and in public media. His peer review papers stretch from physics and toxicology to risk perception, governance, and policy. He also contributes to a regular column in the journal *Nature Nanotechnology* (where he writes on emerging ideas and research around nanotechnology and risk), and writes for the column “Edge of Innovation” on the news and commentary website *The Conversation*. In addition, he directs and produces the YouTube science education channel “Risk Bites”.

Andrew’s science training is in physics – specializing in nanoparticle analysis – and for many years he conducted and led research on aerosol exposure in occupational settings. In the early 2000’s he became increasingly involved in guiding US federal initiatives supporting nanotechnology research and development, and in addressing potential risks. In 2005 he became Chief Science Advisor for the Project on Emerging Nanotechnologies (and later the Synthetic Biology Project) at the Woodrow Wilson International Center for Scholars, and for five years helped inform national and global initiatives addressing the responsible development of nanotechnology. Over this period, he became increasingly interested in science communication and science policy, and began working closely with academics, policy makers, industry, non-government organizations, and journalists, on science-informed decision making. This interest continued between 2010 - 2015 as Director of the University of Michigan Risk Science Center, and Chair of the Environmental Health Sciences Department. In 2015 he joined the faculty of the School for the Future of Innovation in Society at Arizona State University to continue his work and collaborations on socially responsible, responsible and beneficial research and development.

In the course of his work, Andrew has testified before congressional committees, has served on National Academy panels, and has worked closely with organizations such as the World Economic Forum and the International Life Sciences Institute (ILSI) that promote public-private partnerships. He is currently co-chair of the World Economic Forum Global Agenda Council on Nanotechnology, and on the Board of Trustees of ILSI North America. He is also a member of the National Academies of Science Committee on the Science of Science Communication, and advises the science education/engagement program “I’m a Scientist”. While at the University of Michigan he was involved with the innovative science communication training program RELATE, and continues to serve as an advisor to the initiative. In 2015 he was awarded the Society of Toxicology Public Communication Award.

## EDUCATION

- PhD: University of Cambridge, U.K.** 1989 – 1992  
Cavendish Laboratory, Microstructural Physics Department. Ph.D. (Aerosol Physics).  
*Thesis: Ultrafine aerosol particle collection and analysis*
- BSc: University of Birmingham, U.K.** 1984 - 1987  
Physics. B.Sc. (Hons): Iii

## EMPLOYMENT

- Arizona State University** 8/3/15 - Present  
Professor, School for the Future of Innovation in Society 8/3/15 - Present  
Director, Risk Innovation Lab 8/3/15 - Present
- University of Michigan** 4/1/10 – 7/30/15  
Professor, Environmental Health Sciences, School of Public Health 9/1/10 – 7/30/15  
Director, University of Michigan Risk Science Center 4/1/10 – 7/30/15  
Chair, Department of Environmental Health Sciences 6/1/12 – 11/30/14  
NSF International Chair of Environmental Health Sciences 1/1/13 – 11/30/14  
Charles and Rita Gelman Professor of Risk Science 9/1/10 - 12/31/12
- Woodrow Wilson International Center for Scholars** 8/15/05 – 3/31/10  
Chief Science Advisor, Project on Emerging Nanotechnologies  
Science Advisor, Synthetic Biology Project
- National Institute for Occupational Safety and Health** 1/18/00 – 7/8/05  
Team Leader – Aerosols Research Team (GS15) 1/1/04 – 7/8/05  
Senior Service Fellow (GS14). (2000 – 2004) 1/18/00 – 1/1/04
- Health and Safety Executive, U.K.** 9/21/92 – 1/17/00  
Head, Exposure Control Section, Health and Safety Laboratory 9/1/98 – 1/17/00  
Senior Scientific Officer (1994 – 1998) 9/1/94 – 9/1/98  
Higher Scientific Officer (1992 – 1994) 9/21/92 – 9/1/94
- Severn Trent Water Ltd., U.K.** 1/10/87 – 1/10/89  
Management Trainee.

## ACADEMIC POSITIONS

<b>Arizona State University</b> Professor, School for the Future of Innovation in Society Director, Risk Innovation Lab	2015 - Present
<b>University Michigan</b> NSF International Chair of Environmental Health Sciences (2013-2014) Charles and Rita Gelman Professor of Risk Science (2010 – 2013) Professor, Environmental Health Sciences, School of Public Health	2010 - 2015
<b>University of Birmingham, U.K.</b> Honorary Senior Lecturer	2011 – Present
<b>University of Aberdeen, U.K.</b> Honorary Senior Lecturer Department of Environmental and Occupational Medicine	2005 - 2008
<b>University of Cincinnati</b> Associate Professor (volunteer) Environmental Health department	2001 - 2007

## LECTURE COURSES AND OTHER TEACHING EXPERIENCE

<b>Advanced Science and Technology Policy (HSD 502)</b> 3 Credit Hours Arizona State University School for the Future of Innovation in Society	2015 – Present
<b>Introduction to Risk Innovation (HSD 598)</b> 3 Credit Hours Arizona State University School for the Future of Innovation in Society	2015 – Present
<b>Entrepreneurial Ethics</b> 1.5 Credit Hours University of Michigan College of Engineering	2013 – 2015
<b>Principles of Risk Assessment</b> 2 Credit Hours University of Michigan School of Public Health	2011 - 2015
<b>Professional Perspectives in Environmental Health</b> 2 Credit Hours University of Michigan School of Public Health	2011 - 2014
<b>Environmental Health Policy</b> 2 Credit Hours University of Michigan School of Public Health	2012 - 2014
<b>Communicating Science through Social Media</b> 2 Credit Hours University of Michigan School of Public Health	2012 - 2013
<b>Aerosol Dynamics</b> 3 Credit Hours University of Cincinnati, Department of Environmental Health	2002 - 2004
<b>Physics</b> Years 7 – 10, supplemental tuition Chinese Community Center, Sheffield, UK.	1998 – 1999

## **Nanotechnology**

Various one day and half day courses, focusing on basics of nanotechnology, potential risks, and risk management.

2004 - Present

## **PHD ADVISORY COMMITTEES**

Elizabeth Garbee

Current

Ryan Lewis

2015

Dingsheng Li, University of Michigan

2014

Eiwin Lo, University of Michigan

2012

Kristen Russ, University of Michigan

2012

Sebastien Bau, INRS, France. Surface area measurement of nanoscale aerosols.

2008

Shu An Lee, University of Cincinnati. Laboratory and field evaluation of N95 respirators using a new method

2004

## **ENGAGEMENT, TRANSLATION AND COMMUNICATION**

### **The Conversation**

I write a regular column for the news and commentary website The Conversation (Edge of Innovation - <https://theconversation.com/columns/andrew-maynard-128048>). Since starting to write for The Conversation, my articles have received over 200,000 views, and have been republished on websites that include Huffington Post, IFL Science, and The Christian Science Monitor.

2014 - Present

### **Risk Bites**

Risk Bites is a YouTube channel (<http://youtube.com/RiskBites> and <http://riskbites.com>) created to make the science of risk accessible to a broad audience. It is produced, directed and created by Maynard. Videos are aimed at a non-technical audience, and are designed to appeal to casual viewers while providing relevant information on core principles of risk, as well as topical issues. The channel currently has approaching 100 short videos, covering topics ranging from the difference between hazard and risk, to carcinogen evaluation, risk perception, the precautionary principle, and the risks of substances including BPA and nanoparticles to glyphosate. The channel receives close to 20,000 views per month from around the world, and is watched in total for over 40,000 minutes each month (equivalent to over 20 hours per day). The majority of viewers are between 18 and 44. The videos are also used by companies, regulators, educational establishments and others for training and education purposes. The most popular video exceeds 50,000 views.

2012 - Present

### **2020 Science**

2020 Science was initially a personal blog (<http://2020science.org>) aimed at providing commentary on the responsible development of emerging technologies – initially nanotechnology. Since its launch, the blog has been joined by a Twitter feed with over 16,000 followers (<http://twitter.com/2020science>) and a FaceBook page with over 1300 followers (<https://www.facebook.com/PublicAndrewMaynard>). Together, they form an integrated social media platform for engaging on and providing insights into emerging technologies, responsible innovation, and science/risk communication.

2007 - Present

### **RELATE**

In 2015, I became a faculty advisor for the University of Michigan-based science communication training and community engagement program RELATE – Researchers Expanding Lay-Audience Teaching and Engagement (<http://learntorelate.org>). The program – created and led by two PhD students – centers around a 10 week intensive communication course for PhD students across

2015 - Present

science, technology, engineering and math fields, that culminates in a community science communication event for each participant. The combination of learning and practice makes the program particularly powerful in providing early career scientists with strong lay audience communication and engagement skills.

### **Keep on Questioning**

2015 - Present

I am a board member of Keep on Questioning (<http://keeponquestioning.org>), an organization whose mission is to inspire, engage and educate the public by connecting them with professionals and experts. Keep on Questioning is the organizer of I'm A Scientist USA (<http://imascientist.us/>) - a unique online event that connects middle and high school students with scientists, and has just been launched in the US after considerable success in the UK.

### **Mind the Science Gap**

2012 - 2013

Mind The Science Gap (<http://mindthesciencegap.org>) was a unique course that developed communication skills in masters-level students through weekly science blogs. The course resulted in nearly 400 highly successful posts, and still receives over 1,000 page views per day. Posts have been picked up by influential websites, including Gizmodo, and the top-ranking posts has received over 300,000 views. A number of students taking the course have gone on to further develop and use their communication skills.

### **Risk Science Center website**

2010 - 2015

Over my tenure as Director of the University of Michigan Risk Science Center, I developed the Center's website as a unique portal for providing accessible information on science and human health risk to a broad, non-expert audience. This included encouraging and enabling faculty and students to communicate and engage with a broad audience via the portal. In 2015, I mentored the Center's first Writer in Residence (Utibe Effiong), who was successful in developing a substantial web-based communications profile, writing for outlets that include Huffington Post, Slate, and The Conversation. (Note: the Risk Science Center website is no longer maintained by the University of Michigan, but an archived copy is available here: <https://web.archive.org/web/20151028190149/http://www.riskscience.umich.edu/>)

### **Communication and Engagement mentoring**

2010 - Present

Much of my time is spent informally encouraging and mentoring others become effective communicators with non-expert audiences. While this rarely leads to tangible personal metrics of success, it nevertheless increases the reach of effective science communication and engagement. Two examples of this type of mentoring include active support of University of Michigan faculty and staff publishing on The Conversation, where I have worked directly with six of the UM contributors, and a recent series of posts on the World Economic Forum website on nanotechnology and society, where I worked closely with a series of authors on a cohesive series of articles.

### **Working with the Media**

I actively work with journalists and others in print, broadcast and online media on making academic research and insights accessible. My philosophy of working with journalists is to be an accessible, understandable and reliable resource, irrespective of whether my name is associated with subsequent articles or not. I see this role of (often behind the scenes) translator as one that is critically important to ensuring that professional and high profile communicators are able to do the best job possible in translating and communicating research and ideas across multiple platforms, and ensuring that their audiences receive accurate and relevant information. It is not a role that is easily captured by quantitative metrics – but then, this isn't why I do it.

## EXECUTIVE & ADVISORY POSITIONS

<b>Keep on Questioning (I'm A Scientist USA)</b> Board of Advisors	2015 - Present
<b>RELATE (Science Communication)</b> Mentor, and faculty advisor	2015 - Present
<b>Journal of Responsible Innovation</b> Editorial Board	2014 - Present
<b>Dow Distinguished Faculty Fellows</b> Member, University of Michigan Dow Distinguished Faculty Fellows	2013 - 2015
<b>International Life Science Institute</b> ILSI North America Board of Trustees	2012 - Present
<b>Center for Policy on Emerging Technologies</b> Senior Fellow	2012 - Present
<b>Center for Nanotechnology in Society, ASU</b> Member, Board of Visitors	2012 - 2015
<b>Graham Sustainability Institute, University of Michigan</b> Member, Executive Committee	2012 - 2015
<b>World Economic Forum</b> Member of the World Economic Forum Global Agenda Council on Emerging Technologies. (2008 – 2014) Chair of the World Economic Forum Global Agenda Council on Emerging Technologies. (2010 – 2011) Co-chair, World Economic Forum Global Agenda Council on Nanotechnology (2014 – 2016). Member of the World Economic Forum Global Agenda Metacouncil on Emerging Technologies (2014 – Present) Advisory Committee, World Economic Forum Technology Pioneers (2012 – Present)	2008 - Present
<b>Center for the Environmental Implications of Nanotechnology</b> Chair, External Advisory Board	2009 - Present
<b>Nanoscale Informal Science Education Network</b> Advisory board member	2009 - 2015
<b>Annals of Occupational Hygiene</b> Advisory board member	2006 - Present
<b>President's Council of Advisors on Science and Technology</b> Member of the Nanotechnology Working Group	2010 - 2012
<b>President's Council of Advisors on Science and Technology</b> Member of the Nanotechnology Technical Advisory Group	2006 - 2009
<b>Chemical &amp; Engineering News</b> Advisory Board member	2008 - 2011
<b>Organization for Economic Cooperation and Development</b> Working Party on Manufactured Nanomaterials. Project on Emerging Nanotechnologies representative.	2005 - 2007
<b>International Council On Nanotechnology (ICON)</b> Executive Committee member	2004 - 2011
<b>International Life Sciences Institute</b>	2004 - 2010

Member of the ILSI Health and Environmental Sciences Institute Nanomaterial Safety Subcommittee Project Steering Team.

## INTERNAL GOVERNMENT COMMITTEES

**NSET** 2004 - 2005  
NIOSH representative on the Nanomaterial Science, Engineering and Technology (NSET) subcommittee of the National Science and Technology Council (NSTC).

**NEHI** 2004 - 2005  
Co-chair of the Nanotechnology Environmental and Health Impacts (NEHI) interagency working group.

## GOVERNMENT TESTIMONY AND BRIEFINGS

*Formal testimony and briefings include:*

**President's Council on Science and Technology (PCAST)**

Private Meeting on Nanotechnology. Invited briefing. *November 1 2011.*

**Wisconsin Assembly Committee on Public Health**

Presentation at an information hearing on nanotechnology, potential impacts and regulation. *October 2009*

**National Organics Standards Board Materials Committee**

Comments on Proposed Recommendations for Nanotechnology in Organic Production and Processing *May 2009.*

**U.K. House of Lords Select Committee on Science and Technology.**

Written evidence to the Inquiry into the use of nanotechnology in the food sector. *March 2009.*

**Food and Drug Administration.**

Public meeting on FDA-regulated products that may contain nanoscale materials. *September 8 2008.*

**U.S. House of Representatives Committee on Science and Technology.**

Hearing on The National Nanotechnology Initiative Amendments Act of 2008. Invited testimony. *April 16 2008.*

**U.S. House of Representatives Committee on Science and Technology, Subcommittee on Research and Science Education.**

Hearing on Research on Environmental and Safety Impacts of Nanotechnology: Current Status of Planning and Implementation under the National nanotechnology Initiative. Invited testimony. *October 31 2007.*

**U.S. House of Representatives Committee on Science.**

Hearing on Research on Environmental and Safety Impacts of Nanotechnology: What Are the Federal Agencies Doing? Invited testimony. *September 21 2006.*

**President's Council on Science and Technology (PCAST)**

Public Meeting on Nanotechnology. Invited briefing. *June 25 2007.*

**President's Council on Bioethics.**

Nanotechnology. Invited briefing. *June 29 2007.*

**Nanoscale Science, Engineering and Technology Subcommittee, National Science and Technology Council, Committee on Technology;**

Research Needs and Priorities Related to the Environmental, Health, and Safety Aspects of Engineered Nanoscale Materials: Public Meeting. Submitted testimony. *January 4 2007.*

**Food and Drug Administration (FDA)**

Consideration of FDA-Regulated Products That May Contain Nanoscale Materials; Public Meeting. Submitted testimony. *September 9 2008.*



## **European Food Safety Authority**

Written comments on nanomaterials and nanotechnology and food and feeds. *March 2008.*

## **Congressional Nanotechnology Caucus.**

General Briefing on Nanotechnology. Chair. *March 3 2007.*

## **Congressional Nanotechnology Caucus.**

Meeting on Nanotechnology and Environment, Health and Safety. Invited briefing. *November 19 2007*

## **REVIEW PANELS**

**National Academies of Science** 2015 - Present

National Academies of Science committee on the Science of Science Communication

**National Academies of Science** 2010 - 2013

National Academies of Science committee to develop a research strategy for environmental, health, and safety aspects of engineered nanomaterials

**National Academies of Science** 2008

National Academies of Science review panel for the National Nanotechnology Initiative Strategy for Nanotechnology Environmental Health and Safety Research.

**Environmental Protection Agency** 2008

Chair, External Peer Review of the U.S. Environmental Protection Agency Draft Nanomaterial Research Strategy

**Council of Canadian Academies** 2007

Expert Panel on Nanotechnology Assessment

**Environmental Protection Agency** 2008

Panel member, Public Meeting on Risk Management Practices for the U.S. Nanoscale Materials Stewardship Program

## **STANDARDS WORK**

**International Standards Organization** 2001 - 2005

Convener of the International Standards Organization working group TC146/SC2/WG1: Size-selective aerosol sampling and analysis.

## **EDITORIAL BOARDS**

**Journal of Responsible Innovation** 2013 - Present

Member, Board of Editors

**Annals of Occupational Hygiene** 2006 - Present

Advisory board member

**Nano Today** 2006 - 2009

Member of the editorial board

**Journal of Nanoparticle Research** 2006 - 2012

Member of the editorial board

**Nanotoxicology** 2006 - Present

Member of the editorial board

*Reviewer for many peer-reviewed journals, including Nature, Nature Nanotechnology, the Journal of Aerosol Science, Aerosol Science and Technology, the Annals of Occupational Hygiene, Journal of the Air and Water*

*Management Association, the Journal of Nanoparticle Research, Environmental Science and Technology, Nanotoxicology, and the Applied Occupational and Environmental Hygiene Journal.*

## CONFERENCE & WORKSHOP LEADERSHIP

- Seventh International Symposium on Nanotechnology and Occupational Health South Africa (2015). Advisor, and member of the International Advisory Board
- 2015 Michigan Meeting: Academic engagement in public and political discourse Ann Arbor (2015). Meeting organizing committee
- 2013 Bernstein Symposium: Why Is It Hard to Pivot Based on Science? Ann Arbor (2013). Symposium Chair
- Sixth International Symposium on Nanotechnology and Occupational Health Japan (2013). Advisor, and member of the International Advisory Board
- 2011 Risk Science Symposium: Risk, Uncertainty and Sustainable Innovation Ann Arbor MI (2011). Symposium Chair
- Fifth International Symposium on Nanotechnology and Occupational Health Boston (2011). Advisor, and member of the International Advisory Board
- Fourth International Symposium on Nanotechnology and Occupational Health Helsinki (2009). Advisor, and member of the International Advisory Board
- Third International Symposium on Nanotechnology and Occupational Health Taiwan (2007). Co-chair
- Second International Symposium on Nanotechnology and Occupational Health Minneapolis, USA (2005). Co-chair
- Materials Research Society  
Symposium: Nanomaterials and the Environment (2005). Co-chair
- First International Symposium: Nanotoxicology: Biomedical Aspects Miami (2005). Organizing committee
- Developing Experimental Approaches for Evaluation of Toxicological Interactions of Nanoscale Materials  
Gainesville Florida (2004) Steering Committee member
- First International Symposium on Nanotechnology and Occupational Health Buxton, UK (2004). Co-chair
- Emerging Issues in Nanoaerosol Science and Technology  
Workshop sponsored by the National Science Foundation and the Environmental Protection Agency (2003).  
Panel Member
- Royal Society (London)  
“Ultrafine Particles in the Atmosphere” (London, 2000). Co-chair

## PROFESSIONAL SOCIETIES (CURRENT AND PAST MEMBERSHIP)

**The American Association for the Advancement of Science**

**The Institute of Physics** (not current)

**The American Association for Aerosol Research** (not current)

Chair, Working Group on Aerosols and Health, 2004.

**The Aerosol Society, UK.** (not current)

General Secretary, 1998 – 2000.

Committee member, 1995 – 1998.  
 Editor of Society newsletter, 1997 – 2002

## HONORS & AWARDS

<b>Society of Toxicology</b> 2015 SOT Public Communication Award	2015
<b>NIOSH</b> Alice Hamilton Award (Biological Sciences)	2006
<b>CDC/ATSD</b> Shepard Award Nominee	2006
<b>NIOSH</b> Alice Hamilton Award: Honorable Mention (Engineering and Physical Sciences)	2005
<b>NIOSH</b> Alice Hamilton Award: Honorable Mention (Engineering and Physical Sciences)	2004
<b>CDC/ATSD</b> Shepard Award Nominee	2004
<b>NIOSH</b> Alice Hamilton Award: Honorable Mention (Engineering and Physical Sciences)	2003
<b>CDC/ATSD</b> Shepard Award Nominee	2003

## PUBLICATIONS

### PEER REVIEW PUBLICATIONS

- Lewis, R. C., R. Hauser, A. D. Maynard, R. L. Neitzel, L. Wang, R. Kavet, P. Morey, J. B. Ford and J. Meeker (2015). "Personal measures of power-frequency magnetic field exposure among men from an infertility clinic: distribution, temporal variability and correlation with their female partners' exposure " *Radiation Protection Dosimetry* **Advance Publication**: 1-8.
- Axson, J. L., D. I. Stark, A. L. Bondy, S. S. Capracotta, A. D. Maynard, M. A. Philbert, I. L. Bergin and A. P. Ault (2015). "Rapid Kinetics of Size and pH-Dependent Dissolution and Aggregation of Silver Nanoparticles in Simulated Gastric Fluid." *Journal of Physical Chemistry C* **119**(35): 20632-20641.
- Bergin, I. L., L. A. Wilding, M. Morishita, K. Walacavage, A. P. Ault, J. L. Axson, D. I. Stark, S. A. Hashway, S. S. Capracotta, P. R. Leroueil, A. D. Maynard and M. A. Philbert (2015). "Effects of particle size and coating on toxicologic parameters, fecal elimination kinetics and tissue distribution of acutely ingested silver nanoparticles in a mouse model." *Nanotoxicology*.
- Wilding, L. A., C. Bassis, K. Walacavage, S. Hashway, P. Leroueil, M. Morishita, A. D. Maynard, M. A. Philbert, I. L. Bergin (2015) Repeated dose (28 day) administration of silver nanoparticles of varied size and coating does not significantly alter the indigenous murine gut microbiome. *Nanotoxicology* (In Press)
- Harper, S., W. Wohlleben, M. Doa, B. Nowack, S. Clancy, R. Canady and A. Maynard (2015). "Measuring Nanomaterial Release from Carbon Nanotube Composites: Review of the State of the Science." *J Phys Conf Ser* **617**(1).
- Scherer, L. D., A. Maynard, D. C. Dolinoy, A. Fagerlin and B. Zikmund-Fisher (2014). The psychology of 'regrettable substitutions': examining consumer judgments of Bisphenol A and its alternatives. *Health Risk & Society* **16**(7-8): 649-666.
- Hodge, G. A., A. D. Maynard and D. M. Bowman (2014). "Nanotechnology: Rhetoric, risk and regulation." *Science and Public Policy* **41**(1): 1-14.

8. Ramachandran, G., J. Howard, A. Maynard and M. Philbert (2012). "Handling Worker and Third-Party Exposures to Nanotherapeutics During Clinical Trials." *Journal of Law Medicine & Ethics* 40(4): 856-864.
9. Fatehi, L., S. M. Wolf, J. McCullough, R. Hall, F. Lawrenz, J. P. Kahn, C. Jones, S. A. Campbell, R. S. Dresser, A. G. Erdman, C. L. Haynes, R. A. Hoerr, L. F. Hogle, M. A. Keane, G. Khushf, N. M. P. King, E. Kokkoli, G. Marchant, A. D. Maynard, M. Philbert, G. Ramachandran, R. A. Siegel and S. Wickline (2012). "Recommendations for Nanomedicine Human Subjects Research Oversight: An Evolutionary Approach for an Emerging Field." *Journal of Law Medicine & Ethics* 40(4): 716-750.
10. Ramachandran G, Ostraat M, Evans DE, Methner MM, O'Shaughnessy P, D'Arcy J, et al. (2011). A Strategy for Assessing Workplace Exposures to Nanomaterials. *JOEH* 8(11): 673-685.
11. Maynard AD, Warheit D, Philbert MA. (2011). The New Toxicology of Sophisticated Materials: Nanotoxicology and Beyond. *Tox Sci* 120(Suppl 1): S109-S129.
12. Maynard AD, Bowman D, Hodge G. (2011). The problem of regulating sophisticated materials. *Nature Mat* 10: 554-557.
13. Kriegel C, Koehne J, Tinkle S, Maynard AD, Hill RA. (2011). Challenges of Trainees in a Multidisciplinary Research Program: Nano-Biotechnology. *J Chemical Edu* 88(1): 53-55.
14. Shatkin JA, Abbott LC, Bradley AE, Canady RA, Guidotti T, Kulinowski KM, et al. (2010). Nano Risk Analysis: Advancing the Science for Nanomaterials Risk Management. *Risk Analysis* 30(11): 1680-1687.
15. Abbott L.C., Maynard A.D. (2010). Exposure Assessment Approaches for Engineered Nanomaterials. *Risk Analysis* 30(11): 1634-1644.
16. Aitken, R. J., P. J. A. Borm, K. Donaldson, G. Ichihara, S. Loft, F. Marano, A. D. Maynard, G. Oberdörster, H. Stamm, V. Stone, L. Tran and H. Wallin (2009). "Nanoparticles: one word: a multiplicity of different hazards." *Nanotoxicology* 3(4): 263-264.
17. Heitbrink, W. A., D. E. Evans, B. K. Ku, A. D. Maynard, T. J. Slavin and T. M. Peters (2009). "Relationships Among Particle Number, Surface Area, and Respirable Mass Concentrations in Automotive Engine Manufacturing." *J. Occup. Environ. Hyg.* 6(1): 19-31.
18. Park, J. Y., Raynor, P. C., Maynard, A. D., Eberly, L. E. and Ramachandran, G. (2009). Comparison of two estimation methods for surface area concentration using number concentration and mass concentration of combustion-related ultrafine particles *Atm. Environ.* 43:502-509.
19. Shvedova, A. A., Kisin, E., Murray, A. R., Johnson, V. J., Gorelik, O., Arepalli, S., Hubbs, A. F., Mercer, R. R., Keohavong, P., Sussman, N., Jin, J., Yin, J., Stone, S., Chen, B. T., Deye, G., Maynard, A., Castranova, V., Baron, P. A. and Kagan, V. E. (2008). Inhalation vs. aspiration of single-walled carbon nanotubes in C57BL/6 mice: inflammation, fibrosis, oxidative stress, and mutagenesis. *Am. J. Physiol.-Lung Cell. Mol. Physiol.* 295:L552-L565.
20. Pui, D. Y. H., C. Qi, N. Stanley, G. Oberdörster and A. Maynard (2008). "Recirculating Air Filtration Significantly Reduces Exposure to Airborne Nanoparticles." *Environ Health Perspect* 16(7): 863-866.
21. Poland, C. A., Duffin, R., Kinloch, I., Maynard, A., Wallace, W. A. H., Seaton, A., Stone, V., Brown, S., MacNee, W. and Donaldson, K. (2008). Carbon nanotubes introduced into the abdominal cavity of mice show asbestos-like pathogenicity in a pilot study. *Nature Nanotechnology* 3:423-428.
22. Hansen, S. F., Maynard, A., Baun, A. and Tickner, J. A. (2008). Late lessons from early warnings for nanotechnology. *Nature Nanotechnology* 3:444-447.
23. Maynard, A. D. and Pui, D. Y. H. (2007). Nanotechnology and occupational health: New technologies – new challenges. *J. Nanopart. Res.* 9:1-3.
24. Maynard, A. D., Ku, B. K., Emery, M., Stolzenburg, M. and McMurry, P. H. (2007). Measuring particle size-dependent physicochemical structure in airborne single walled carbon nanotube agglomerates. *J. Nanopart. Res.* 9:85-92.
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174. Maynard, A. D. and L. M. Brown (1991). "The Collection of Ultrafine Aerosol-Particles For Analysis By Transmission Electron-Microscopy, Using a New Thermophoretic Precipitator." *Journal of Aerosol Science* **22**: S379-S382.

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**INVITED LECTURES AND ADDRESSES (Selected)**

1. Royal Society. "Overview of methods for analyzing single ultrafine particles." 3/15/00
2. University of Cincinnati. "Perspectives on a 'small' problem." 5/7/02
3. University of Mysore, India. "Measuring exposure to nanoparticles." 8/21/02
4. Center for Filtration Research. "Ultrafine aerosol characterization. An overview of current research within the Division of Applied Research and Technology (DART)." 10/28/03
5. Nanotechnology Science Engineering and Technology subcommittee. "Ultrafine particles. Status of Practices, Standards and R&D within the National Institute for Occupational Safety and Health (NIOSH)" 8/3/03
6. Oak Ridge National Laboratory. "When size becomes important. Exploring physicochemical aspects of nanoparticles in the context of potential health risks."  
7. 12/16/03
8. Scandinavian Electron Microscopy Conference. "From Nuisance dusts to Nanoparticles. The Role of Electron Microscopy in Occupational and Environmental Health." 6/13/03
9. American Industrial Hygiene Association. "Perspectives on a 'small' problem. Assessing exposure to ultrafine particles" 1/13/04
10. ORC. "Perspectives on a 'small' problem. Nanotechnology and Occupational Health." 2/3/04
11. American Chemistry Society. "Nanotechnology and Occupational Health National Institute for Occupational Safety and Health (NIOSH)" 3/28/04
12. California Department of health Services". Perspectives on a 'small' problem. Nanotechnology and Occupational Health." 3/25/04
13. University of Minnesota. "Altered perspectives: Nanotechnology and Occupational Health." 5/5/04
14. ORC. "Perspectives on a 'small' problem. Nanotechnology and Occupational Health." 5/12/04
15. Woodrow Wilson International Center for Scholars. "Nanotechnology: The new technological revolution. Ensuring a safe and healthful workforce in a changing environment." 5/18/04
16. Institute of Occupational Medicine. "Nanotechnology  
17. Strategies to ensure Occupational Health." 5/27/04
18. Proctor & Gamble "Nanotechnology: The new technological revolution. Physical characterization and monitoring of airborne nanoparticles." 6/27/04
19. MATFORUM, Germany. "Nanomaterials and Occupational Health. Establishing a Healthy Working Environment." 9/20/04
20. Professional Conference on Industrial Hygiene. "Perspectives on a 'small' problem. Nanotechnology and Occupational Health." 10/2/04
21. NANO 2004. "Nanotechnology and Health Impact. Challenges and Opportunities." 10/5/04
22. OSHA. "Nanotechnology: Challenges and opportunities." 10/8/04
23. NIOSH Board of Scientific Councilors. "The NIOSH Nanotechnology Initiative. Ensuring a safe and healthful workforce in a changing environment." 10/21/04
24. American Chemistry Council. Nanotechnology and Occupational Health. "Ensuring a safe and healthful workforce in a changing environment." 10/24/04
25. National Nanotechnology Infrastructure Network. "Working with engineered  
26. Nanomaterials. Towards developing responsible work practices in an uncertain world." 12/2/04
27. National Occupational Research Agenda. "Nanotechnology at NIOSH. Ensuring a safe and healthful workforce in a changing environment." 12/2/04
28. Semiconductor Research Consortium. "Working with engineered nanomaterials. Towards developing safe work practices." 12/14/04

29. Health and Environmental Sciences Institute. "Evaluating and controlling nanomaterial exposure in the workplace." 1/16/05
30. American Association for the Advancement of Science. "Nanoaerosol exposure. Generating and characterizing airborne nanoparticles." 2/20/05
31. University of Cincinnati. "Understanding the potential impact of nanotechnology on occupational health." 2/23/05
32. Society of Toxicology. "Characterizing exposures to nanomaterials." 3/8/05
33. World Environment Center. "Nanomaterials and occupational health. Establishing a healthy work environment." 3/11/05
34. American Institute of Chemical Engineers. "Working with engineered nanomaterials: Towards developing safe work practices." 4/12/05
35. Toxicology and Risk Assessment Conference. "Nanotechnology and occupational health." 4/27/05
36. University of Cincinnati. "Working with engineered nanomaterials: Towards developing safe work practices." 5/5/05
37. Korean Occupational Safety and Health Agency, Daejeon, South Korea. "Working with engineered nanomaterials: Towards developing safe work practices." 5/11/05
38. Korean Society of Toxicology. "Nanotechnology and occupational health – addressing potential health risks." 5/13/05
39. AIHCE. "Nanotechnology: Overview and relevance to occupational health." 5/24/05
40. AIHCE. "Working at the nanoscale: nanotechnology and potential health risk." 5/24/05
41. EPA. "Nanotechnology and Occupational Health." 6/13/05
42. International Conference on Materials for Advanced Technologies, Singapore. "Addressing the Potential Environmental and Human Health Impact of Engineered Nanomaterials." 7/4/05
43. Royal Society. "Project on Emerging Nanotechnologies." 7/11/09
44. American Industrial Hygiene Association "Nanotechnology: Overview and Relevance to Occupational Health. 09/14/05
45. National Academies of Science, Chemical Sciences Round Table. "Nanotechnology: Opportunities and Challenges in a Changing World." 09/21/05
46. 2<sup>nd</sup> International Symposium on Nanotechnology and Occupational Health. Opening remarks. 10/3/05
47. 2<sup>nd</sup> International Symposium on Nanotechnology and Occupational Health. "Woodrow Wilson Center Project on Emerging Nanotechnologies" 10/6/05
48. NASA. "Nanotechnology: Overview and relevance to Occupational Health" 10/21/05
49. EPA Grantees Meeting. "Nanotechnology and Human Health Impact." 10/27/05
50. Society Of Toxicology. "Engineered Nanomaterials and Occupational Health" 11/2/05
51. European Center for Ecotoxicology and Toxicology of Chemicals (ECETOC). "Engineered Nanomaterials: Measurement in the Occupational Setting" 11/7/05
52. Association of Inhalation Toxicologists. "Characterizing Exposure to Airborne nanoscale Particles" 11/10/05
53. BNA Audioconference "The EHS Implications of Nanotechnology: What They Are and What You Need to Know." 11/17/05
54. Project on Emerging Nanotechnologies. "Inventory of Research on the Environmental Health and Safety Implications of Nanotechnology" 11/29/05
55. Australian Institute for Occupational Hygiene. "Engineered Nanomaterials and Occupational Health" 12/4/05
56. Australian Institute for Occupational Hygiene. "Working at the Nanoscale Nanotechnology and Potential Occupational Health Risk." 12/7/05
57. Asia Nanotechnology Forum. "Assessing the environmental safety and human health risk of emerging nanotechnologies" 12/9/05

58. Academia Sinica, Taiwan. "Nanotechnology: Environment, Safety and Health." 01/04/06
59. Institute of Occupational Safety and Health (IOSH), Taiwan. "Working at the Nanoscale. Nanotechnology and Potential Occupational Health Risk" 01/05/06
60. ITRI, Taiwan. "Working at the Nanoscale. Nanotechnology and Potential Occupational Health Risk" 01/06/06
61. ORC working group on nanotechnology. "Recent activities: Nanotechnology and potential risk" 01/19/06
62. Meeting: "Exploring the small world: The role of public research institutes" Tokyo, Japan. "Nanotechnology and Human Health Impact. Assessing Potential Risk" 02/01/06
63. Science Media Center, Royal Institution, London. "Nanotechnology, risk and the need for strategic research." 02/06/06
64. CHE National Partnership. "Nanotechnology and potential risk" 02/28/06
65. Joint EFCOG/DOE Chemical Management Workshop. "Nanotechnology: The current state of affairs." 03/14/06
66. Robert and Floretta Austin Distinguished Lecture in Science. University of Idaho, Moscow. "Nanotechnology: The next big thing, or much ado about nothing?" 04/17/06
67. Warner Lecture, British Occupational Hygiene Society. "Nanotechnology: The next big thing, or much ado about nothing?" 04/25/06
68. Institute of Occupational Medicine. "Nanotechnology and occupational health. Challenges and opportunities." 04/27/06
69. University of Aberdeen. "Nanotechnology, health and the environment. A new challenge for a new era?" 05/02/06
70. Science Media Centre, Royal Institution, London. "Nanotechnology on high street." 05/04/06
71. Nanoscience Centre, University of Cambridge, UK. "Nanotechnology and potential risk. Challenges to measuring exposure to engineered nanomaterials." 05/05/07
72. American Forest and Paper Association. "Perspectives on nanotechnology. Risk and risk management." 05/10/06
73. The Annual Nanobusiness Alliance conference. Mock NEPA hearing. 05/18/06
74. American Thoracic Society. "Nanotechnology and human health. A new challenge for a new era?" 05/22/06
75. The Conference Board. "Nanotechnology. An introduction to the technology, and its EH&S implications." 06/08/06
76. Dutch Society of Toxicology. "Exposure to nanoparticles. New challenges to understanding and evaluating potential health impacts." 06/14/06
77. International Symposium on Nanotechnology in Environmental Protection and Pollution, Hong Kong. "Nanotechnology and potential health impact. Developing a framework for strategic research." 06/19/06
78. Graduate Seminar, Hong Kong University of Science and Technology. "Nanotechnology: Health, safety and the environment. New challenges for a new era?" 06/23/06
79. ASME 4<sup>th</sup> Nano Training Boot Camp. "Nanotechnology: Is it a risk to human health?" 07/13/06
80. University of Maryland. "Nanotechnology: Health, safety and the environment. New challenges for a new era?" 07/14/06
81. Woodrow Wilson International center for Scholars. "Nanotechnology: A research strategy for addressing risk." 07/19/06
82. IOM, Edinburgh UK. "Global challenges in the pursuit of responsible nanotechnologies." 7/26/06
83. Student Pugwash USA. "Nanotechnology science policy." 8/4/06
84. Lux Research. "Nanotechnology risk in the workplace." 8/8/06
85. NATO ARW, Bulgaria. "Nanotechnology: Overview and issues." 8/13/06
86. Cosmetics, Toiletries and Fragrance Association (CTFA). "Nanotechnology and human health" 9/15/06

87. Genesee Valley Safety Conference Professional Development Course. "Nanotechnology and nanoparticles: What are they? What good are they?" 9/20/06
88. Technology Review Emerging Technologies Conference. "Ensuring the safety of engineered nanomaterials: Five Major Challenges." 9/27/06
89. Nanotechnology Life Cycle Assessment workshop. "Nanotechnology: The basics, and the products" 10/2/06
90. ORC International Executive Business Issues Forum. "Nanotechnology. Addressing potential risks." 10/11/06
91. Nano4Food Conference. "Nanotechnology and toxicology. Are there reasons to be concerned about food and nanotechnology together?" 10/12/06
92. University of Virginia. Invited comments on the Opening ceremony for Wilsdorf Hall. 11/10/06
93. American Institute of Physics Industrial Forum. "Nanotechnology oversight. Protecting health and the environment in an uncertain world." 11/14/06
94. Woodrow Wilson International Center for Scholars. "Safe handling of nanotechnology." 11/16/06
95. American Society of Safety Engineers. "Risks of nanotechnology. How do we prepare for potentially adverse biological impact?" 11/17/06
96. Nanotechnology Occupational Environmental Health and Safety Conference. "Sound science for safe nanotechnology." 12/6/06
97. Health and Environmental Funders Network. Briefing. 12/15/06
98. ICON. "Assessing the risks of engineered nanomaterials. Setting the scene." 1/9/07
99. University of Minnesota. "Nanotechnology in context." 1/18/07
100. NGO consortium on nanotechnology. "Safe handling of nanotechnology." 1/26/07
101. Rabobank North American Agribusiness Advisory Board. "Nanotechnology. Why should you care?" 1/30/07
102. Senior Management at the Hong Kong Department of Labor. "Nanotechnology benefits and challenges." 2/8/07
103. Hong Kong Labor Department. "Nanotechnology and Occupational Health Part I." 2/9/07
104. Hong Kong Labor Department. "Nanotechnology and Occupational Health Part II." 2/9/07
105. Chemistry Innovations (UK). "Smart Science: Addressing the impacts of nanotechnologies." 2/21/07
106. Woodrow Wilson International Center for Scholars. "Nanotechnology in developing countries." 2/27/07
107. International Consumer Products Health and Safety Association. "Nanotechnology. Maximizing the benefits. Minimizing the risks." 3/2/07
108. CalEPA. "Nanotechnology. Maximizing the benefits. Minimizing the risks." 3/8/07
109. ACC Nanotechnology Panel. Briefing. 3/14/07
110. Ohio State University. "Smart Science: The challenges and benefits of getting nanotech right. Part I – the science perspective." 3/16/07
111. Ohio State University. "Smart Science: The challenges and benefits of getting nanotech right. Part II – the social perspective." 3/16/07
112. Society of Toxicology. "Challenges of monitoring exposure to carbon nanotubes" 3/26/07
113. Johns Hopkins University. "The science of nanotechnology and public health" 4/10/07
114. Health Effects Institute annual conference. "Nanoparticles from manufacturing." 4/16/07
115. Nanotoxicology conference, Venice. "Nanotechnology. Science, society and policy." 4/19/07
116. New York Academy of Sciences. "Nanotechnology. Science, society and policy." 5/14/07
117. Midwest nanotechnology safety workshop. "Smart Science. The challenges and benefits of getting nanotech right in the laboratory." 5/21/07
118. Citizens coalition on nanotechnology. Nano-pub. 5/21/07
119. American Industrial Hygiene Conference and Exposition. "Safe Nanotechnology. Getting it right first time round." 6/2/07

120. Resources for the Future. "A Nanotechnology Primer." 6/6/07
121. Woodrow Wilson International Center for Scholars. "The Twinkie Guide to Nanotechnology." 6/6/07
122. International conference on nanotechnology for the forest products industry. "Delivering safe nanotechnology through science." 6/6/07
123. Woodrow Wilson International center for Scholars. Launch of Environmental Defense/DuPont NanoSafe Framework 6/21/07
124. Chemistry Innovations web-seminar. "Smart Science: Addressing the impacts of nanotechnologies." 7/25/07
125. 3<sup>rd</sup> International Symposium on Nanotechnology, Occupational and Environmental Health. "Safe Nanotechnology. Where are we now, and where are we going?" 8/29/07
126. HBA Global Expo. "The Quest For Safe Nanotechnology Science, Public Perception And Oversight Policy." 9/19/07
127. International Society for Exposure assessment. "Small Particles Big Challenges Assessing exposure to airborne nanoparticles." 10/15/07
128. American Industrial Hygiene Association Toxicology Symposium. "Nanotechnology Opportunities and Challenges." 10/18/07
129. Michigan Risk Science Center Bernstein Symposium. "Developing Societally Acceptable Nanotechnologies." 10/25/07
130. Genetics and Environmental Mutagenesis Society. "Nanotechnology The Next Big Thing, or Much Ado about Nothing?" 10/29/07
131. Alberta Health and Safety Conference. "Nanotechnology The Next Big Thing, or Much Ado about Nothing?" 11/5/07
132. Nanotechnology Informal Science Education Network Annual Meeting. "Please Don't Shout! We're not deaf - we're just not interested." 11/7/07
133. Nanotechnology Risk Management Workshop. "The Science of Nanosafety" 11/15/07
134. European NanOSH conference. "Future Challenges. Emerging Global Safety Issues of Nanotechnologies." 12/3/07
135. Debate on Governance Initiatives for the European Nanotechnology Community in the Public and Private Sectors. Brussels Belgium. "The US Perspective on Nanotechnology Codes of Conduct." 12/5/07
136. Canadian Workshop on Multidisciplinary Research on Nanotechnology: Gaps, Opportunities and Priorities. Edmonton, Canada. "Nano-risk or Nano-myth? A Science perspective on safe nanotechnology." 1/22/08
137. University of Alberta. "Managing the Small Stuff: Ensuring the Success of Safe Nanotechnologies" 1/23/08
138. NANOCAP Working Conference. "Challenges to developing safe nanotechnologies." 2/7/08
139. Consumer Trends Forum International. "Nano Consumers! Getting nanotechnology right first time round." 2/22/08
140. International Conference on Nanoscience and Nanotechnology, Australia. "Are we driving blind into a nanotechnology future?" 2/28/08
141. Australian Science Media Center. "Nanotechnology 'On the Radar'" 2/28/07
142. Australian Office of Nanotechnology public forum. "An introduction to nanotechnology." 2/28/08
143. Australian National Measurements Institute. "Measurement: The hidden challenge to ensuring safe nanotechnologies." 3/3/08
144. Wilmington science club. "Nanotechnology. The Next Big Thing, or Much Ado about Nothing?" 3/24/08
145. Science Museum of Virginia. "The TWINKIE Guide to Nanotechnology." 4/2/08
146. Launch of Power of Small: Nanotechnology. Public comments. 4/2/08
147. AIHCE. "Nanotechnologies and Nanoparticles Industrial Hygiene and Policy Implications." 4/15/08
148. Institute of Medicine. "Science at FDA: Challenges and Opportunities." 4/21/08



149. John Hopkins University. "But is it safe...? The challenges of getting nanotech right first time round." 5/2/08
150. Swedish Academies of Science. "Smart Science. Challenges and opportunities in the race to develop safe nanotechnologies." 5/12/08
151. Gothenburg University, Gothenburg, Sweden. "Managing the Small Stuff. Ensuring the success of safe nanotechnologies." 5/13/08
152. Science Media Center, UK: Toxicity of carbon nanotubes. 5/20/08
153. NCEH-ATSDR/CDC. "Nanotechnology. The Next Big Thing, or Much Ado About Nothing?" 6/4/08
154. Society for Risk Assessment. "Towards "Safe" Nanotechnologies. Where do we want to be; how will we get there?" 6/10/08
155. European Aerosol Conference. "Developing Responsible Nanotechnologies. An Aerosol Perspective." 8/28/08
156. Society for Risk Analysis. Informing the Management of Emerging Nanoscale Materials. 9/10/08
157. National Academies of Science. Briefing on synthetic biology. 9/12/08
158. Nano4All meeting, Utrecht, Netherlands. "A Bluffers' Guide to Nano Risk." 10/15/08
159. Nano4All meeting, Utrecht, Netherlands. "Engineered Nanomaterials: Assessing and Managing Potential Risks." 10/15/08
160. Royal Society. Briefing on Synthetic Biology 10/17/08
161. American Association for Aerosol Research. "Challenges to ensuring the safety of emerging nanomaterials." 10/20/08
162. Environmental Nanoparticles: Science, Ethics, and Policy. "A bluffer's guide to environmental nanoparticles." 11/10/08
163. INRS, Nancy, France. "Developing responsible nanotechnologies. An aerosol perspective." 12/4/08
164. Duke University. "Small Science; Small Politics.
165. A Washington DC Perspective on Nanoscience and Nanotechnology." 1/22/09
166. Emerging Technologies Forum. "'Biohacking:' The Promise and Challenges of Synthetic Biology." 2/10/09
167. Oxford University. "Rethinking science and technology innovation for the 21st century: A nanoscale perspective." 3/12/09
168. International Joint Commission. "Nanotechnology in perspective. New technologies, new challenges?" 3/30/09
169. Museum of American History. "So nano, so what? The what, why, where of nanotechnology." 4/4/09
170. University of California, Los Angeles. "Nanotechnology in perspective. Towards science-informed regulatory policies." 4/17/09
171. Institute for Advanced Learning and Research. "Nanotechnology: What's the big deal?" 5/1/09
172. Institute for Advanced Learning and Research. "Engineering matter at the nanoscale. What could possibly go wrong?" 5/1/09
173. Institute for Advanced Learning and Research. "Do you 'do' nano? The politics of getting nanotechnology right." 5/1/09
174. Values in Decisions on Risks (VALDOR) conference, Stockholm Sweden. "Managing risk in a changing world: What's science got to do with it?" 6/8/09
175. The Cloud Project, London. Public engagement on emerging technologies. 6/9/09
176. Transatlantic Consumer Dialogue. "Nanomaterials and consumer products. A perspective from the US." 6/10/08
177. Knight Science Journalism Kavli Workshop. "Changing patterns of mass media coverage: Nanotechnology Risks." 6/18/09
178. Knight Science Journalism Kavli Workshop. "Small science; small politics. A DC perspective on nanoscience and nanotechnology." 6/18/09

179. Brookings Institute. "Controlling wayward science: Dangers of unanticipated consequences." 6/19/09
180. International Risk Governance Council. "Two sides of the coin. Regulation, and the enabling and constraint of technology innovation. Lessons fro nanotechnology." 6/30/09
181. 4<sup>th</sup> International Conference on Nanotechnology – Occupational and Environmental Health (NANOEH2009). "Ten things everyone should know about nanotechnology safety." 8/29/09
182. Department for Business, Innovation and Skills, UK. "Inspiring Science with BIS: Who's your role model and how can we encourage the next generation of scientists, engineers and technologists?" 9/7/09
183. International Conference on Transatlantic Regulatory Co-operation: Securing the Promise of Nanotechnologies, Chatham House, London. "Emerging nanotechnologies and regulatory challenges." 9/11/09
184. Nanoscale Informal Science Education Network, Annual Meeting. "Current state of the science – nanotechnology and potential risks." 9/14/09
185. Wisconsin Assembly Committee on Public Health. "Nanotechnology. Opportunities and challenges." 10/6/09
186. California Nanotechnology Initiative Symposium V: An Industry Perspective (Meeting chair and moderator). 11/16/09
187. BNA Webinar. "Ten things everyone should know about nanotechnology safety... in seven easy steps." 12/2/09
188. University of Minneapolis NIRT. "Governing Nanobiotechnology: Making sense of a wicked problem." 4/15/10
189. Johnson & Johnson. "Effective evidence-based communication strategies. Lessons from nanotechnology" 5/19/10
190. University of Cambridge Center for Research in the Arts, Social Sciences and Humanities (CRAASH). "Governing emerging technologies under conditions of uncertainty"
191. Nanotoxicology 2010 Conference, Keynote. "Nanotoxicology? You ain't seen nothing yet!" 6/4/10
192. Nano 2010, Clemson University. "Debunking the nanotechnology myth" 8/22/10
193. NISE Net annual meeting, keynote. "Smoke, mirrors and some really cool science. Current perspectives on nanotechnology" 10/25/10
194. Gelman Professorship lecture, University of Michigan "Building a sustainable future: The role of risk science" 11/17/10
195. Society for Risk Analysis Annual Meeting. "Emerging technologies, emerging risks: Separating the wheat from the chaff" 12/5/10
196. Cincinnati Contemporary Arts Center. "Small Gods... and the art of technology innovation" 12/11/10
197. World Economic Forum Annual Meeting, Davos. Challenge to the panel. "The science agenda in 2011" 1/26/11
198. Water, Energy and Oil: Ann Arbor Science Café. 2/9/11
199. University of Michigan Decision Consortium. "The ethics of doubt: Enabling informed decisions on emerging technologies" 2/10/11
200. Swiss National Science Foundation. "The new science of sophisticated materials: Nanomaterials and beyond" 3/3/11
201. University of Michigan Second Life seminar. "Seven Deadly Sins of a techno-complacent society" 3/8/11
202. Michigan Nanotechnology Institute for Medicine and Biological Sciences. "Debunking the nanotechnology risk myth" 4/11/11
203. MEDIA 140 event, Brisbane (via video link). "Social media and science communication" 4/26/11
204. University of Michigan Weinburg Symposium. Panel discussion on "Changing minds: Optogenetic manipulation of the brain" 5/9/11
205. University of Cincinnati ERC. "Nanomaterials dangerous? Who are you kidding! The art and science of ensuring the safe use of sophisticated materials" 5/10/11

206. NanoLINEN, Berlin. “All in the mind? Exploring how perception influences action on nanotechnologies” 5/25/11
207. Institute of Food Technologists conference. “Making sense of consumer perception in a technology-dependent society” 6/14/11
208. NANOMMUNE project, invited lecture, Stockholm. “The new science of sophisticated materials: Nanomaterials and beyond” 6/16/11
209. American Chemistry Society webinar (moderator). “Nanotechnology” 8/25/11
210. University of Minnesota. “The challenges posed by nanomedicine research in human beings” 9/26/11
211. American Chemistry Society webinar (moderator). “The chemistry of fireworks” 12/8/11
212. Rutgers University. “The new science of sophisticated materials: Nanomaterials and beyond” 3/2/12
213. University of Michigan Department of Environmental Health Sciences, 125<sup>th</sup> anniversary. “Think small” 3/24/12
214. Harvard University. “The new science of sophisticated materials: Nanomaterials and beyond” 4/13/12
215. NANODEVICE (European project, invited lecture), Copenhagen. “Exciting results are not enough? What is needed for effective exploitation and media attention?” 4/25/12
216. Toxicology Forum Annual Meeting. “When 2+2 equals whatever. Handling risk in a risk-illiterate world” 7/9/12
217. University of Michigan Erb Institute. “Does sustainable innovation demand new models of technology innovation?” 10/1/12
218. 2012 Arnold Small Lecture, Human Factors and Ergonomics Society Annual Meeting. “From the nanoscale to the human scale: Connecting nanotechnology and human factors” 10/24/12
219. Argentinean Foundation of Nanotechnology. “Thinking critically and imaginatively about the challenges of sophisticated materials” 10/30/12
220. Dieticians in Business and Communication Communications Camp. “Dancing with the enemy. A practical perspective on communicating complex science through social media”. 3/8/13
221. First annual conference on Governing Emerging Technologies: Law, Policy and Ethics. “Technology innovation and the new social responsibility” 5/19/13
222. US Army Tank Automotive Research, development and Engineering Center. “Flipping the risk equation: Can informed risk management support effective innovation?” 6/6/13
223. Risk Assessment of Innovative Materials Workshop. “Innovative materials. What are they and why should we care?” 8/1/13
224. World Economic Forum Annual Meeting of the New Champions, Dalian China. Panelist “Building the 21<sup>st</sup> century regulatory system” 9/12/13
225. World Economic Forum Annual Meeting of the New Champions, Dalian China. Session moderator “Strategic shifts in the healthcare ecosystem” 9/11/13
226. 2013 Bernstein Symposium, moderator. “Why is it hard to pivot based on science?” 9/26/13
227. University of Michigan School of Public Health doctoral students association invited lecture: “Communicating Public Health – when 140 characters makes everyone an expert.” 10/21/13
228. S.Net annual meeting keynote lecture: “Technology innovation and the new social responsibility.” 10/27/13
229. University of Washington School of Public Health, Invited lecture: “Advanced Materials. An Environmental Health Perspective” 2/6/14
230. University of Michigan Libraries invited lecture: “Getting Down and Dirty: Academics and YouTube.” 2/26/14
231. National Academy of Sciences Forum on Synthetic Biology invited presentation: “Innovative approaches to emergent risks” 3/13/14
232. University of Michigan Dow Sustainability Fellows Invited Lecture: “Sustainable Innovation: A load of baloney or the best thing since sliced bread?” 3/18/14

233. University of Maryland Baltimore Graduate Student Association, Invited Lecture: “Riding the Tiger: Communication and 21<sup>st</sup> Century Science” 3/24/14
234. Arizona State University Fulton Schools of Engineering, invited lecture: “Responsible Innovation: Do we need it and is it practicable?” 3/31/14
235. Royal Society of London meeting on bio-nano interactions: new tools, insights and impacts. Invited lecture: “Innovative approaches to emergent risks”. 5/1/14
236. We Make Health faire, Ann Arbor, invited talk: “Color my poop beautiful, and other takes of tech derring-do.” 8/16/14
237. Michigan State University Environmental Science and Policy Program, 2<sup>nd</sup> Annual Research Symposium. Thinking Differently about Risk. Invited lecture “New approaches to connecting evidence to decisions”. 10/10/14
238. NSF Workshop: Environmental Implications of Additive Manufacturing. Invited paper “Occupational health challenges of additive manufacturing”. October 14 2014.
239. Notre Dame University. Invited lecture “Is responsible nanotechnology doomed to failure?” 10/27/14
240. Michigan State University. Invited lecture “Novel ways to consider food and nutrition risk”. 2/18/15
241. National Research Council of Italy. Invited paper “Risks and benefits of the application of sophisticated materials to the food sector”. 5/6/15
242. Gordon Research Conference on nanoscale science and engineering for agriculture and food systems. Invited lecture “Don’t Eat the Donut!” 6/7/15
243. University of Rochester Toxicology Program. Invited lecture: “How safe are your socks? Exploring the challenges of advanced material safety”. 6/11/15
244. NanOEH conference, South Africa. Plenary Presentation “Responsible Innovation and Nanotechnology”. 10/18/15
245. SETAC short course. Invited Lecture: “Science communication and the media”. 11/1/15
246. CSPO DC breakfast. Invited presentation: Why we need risk innovation” 11/18/15

## RESEARCH SUPPORT

### Pre-2010

Listing information on grants and other funding bid for and awarded while working for the UK and US governments and the Woodrow Wilson Center is not straight forward, due to the confidential nature of some information (including exact funding figures) and less than transparent accounting practices. To further confound the issue, a number of grants (not included below) were associated with team efforts where contributions to winning awards and leading research were shared. While at the Health and Safety Laboratory and NIOSH, I was responsible for ensuring funding for teams of researchers that varied in size between 8 and 12 people (including salaries, benefits and overheads) – between approximately \$800k and \$1.5M per year, all of which needed to be competitively bid for at HSL, and much of it competitively bid for at NIOSH. This included identifying and developing funding opportunities for team members to apply for. At NIOSH I was also directly responsible for the establishment of the NIOSH Nanotechnology Research Center – a virtual center that was awarded \$500k per year in seed money, on top of other grants awarded to Center members. At the Project on Emerging Nanotechnologies, I was a key member of the team that negotiated two extensions to a grant from Pew Charitable Trusts, worth ~\$3.5M over three years.

I was the Principle Investigator on the following grants successfully bid for at HSL and NIOSH. The HSL records are incomplete due to relevant information not being available. Award amounts at NIOSH include estimates of full time employee costs associated with the grants.

### Health and Safety Laboratory

Year	Duration	Reference	Title	Est. Amount

# CURRICULUM VITAE

Andrew D. Maynard Ph.D

	<b>(years)</b>			<b>(total)</b>
1994	3	R42.58	Testing of cyclone samplers with non-spherical particles	N/A
1994	3	R42.73	Measurement of short-term peaks in dust exposure	N/A
1995	5	R42.84	The development of samplers for selective fibre sampling	N/A
1996	4	C51.001.96	Particle transport loss measurements on two multi-port filter holders	N/A
1998	2	JS404679	Review of offshore Drilling Muds and Other Downhole Chemicals	N/A
1998	2	R42.99	Development of a Modular Axial Flow Cyclone System	N/A
1999	1	JS2000825	Exposure to ultrafine aerosol particles in the workplace	N/A
1999	1	R43.801	Review of research needs and capabilities addressing ultrafine particles in the workplace	N/A

## **National Institute for Occupational Safety and Health**

<b>Year</b>	<b>Duration (years)</b>	<b>Reference</b>	<b>Title</b>	<b>Est. Value (total)</b>
2000	4	7399	Development of ultrafine particle characterization and monitoring methods	\$680,000
2002	3	8417	Physical characteristics of ultrafine particles	\$1,800,000
2003	2	0082	Generation and characterization of ultrafine particles	\$615,000
2003	2	006A	Aerosol Exposure Characterization	\$315,000

## **Additional Research Support**

NMP4-SL-2009-228789 (Tran, Coordinator): 2009 - 2012

European Commission, FP7

Risk Assessment of Engineered Nanoparticles. Comprehensive risk assessment of engineered nanomaterials

Role: Investigator

Synthetic Biology Project (David Rejeski, Director), 2008 - 2011

Alfred P Sloan Foundation

Addressing potential benefits and challenges of synthetic biology, working with stakeholders in government, industry, academia, civil society and the broader public.

Role: Chief Science Advisor

Project on Emerging Nanotechnologies (David Rejeski, Director), 2005 - 2010

Pew Charitable Trusts

Addressing potential benefits and challenges of nanotechnologies, working with stakeholders in government, industry, academia, civil society and the broader public.

Role: Chief Science Advisor

Regulating Nanotechnologies in the EU and US: Towards Effectiveness and Convergence (Robert Faulkner, PI), 2008 – 2009

European Commission

An analysis of the comparative dimensions of nanotechnologies regulation in the EU and USA

Role: Investigator

EMERGNANO (R Aitken, PI), 2008-2009

DEFRA, UK

A review of completed and near- completed environment, health and safety research on nanomaterials and nanotechnology.

Role: Investigator

## **Post-2010 (not including Risk Science Center funding)**

Michigan State University 2014 – 2017

Center for Ingredient Safety and Risk Assessment-Risk Communications Subcontract

Role: Principle Investigator

Direct costs: \$370,149

Alfred P Sloan Foundation (via University of Pennsylvania subcontract) 2013 - 2014

Designing a "Solution-Focused" Governance Paradigm for SynBio: Case Studies of Improved Risk Assessment and Creative Regulatory Design

Role: Participating Investigator

Direct costs (personal): \$7,964

University of Michigan OVPR. 2012 – 2013

Seminar series: Information Communication through Data Visualization

Role: Principle Investigator

Direct costs: \$7,500

NSF CBET-1239092. 2012 – 2013

Workshop: A roadmap for developing and implementing minimum nanomaterial characterization reporting requirements within regulatory and development communities

Role: Principle Investigator

Direct costs: \$29,500

NIEHS, U01. 2010 - 2015

Modulation of immune-GI function by nanoAg. The goal is to better understand the mechanisms by which ingested engineered nanomaterials interact with the GI tract and the microbiome, and impact on further organs and systems.

Role: Co-Investigator

Direct costs: \$387,276.00

Sloan Foundation (B2011-23) 2011

Support for 2011 Risk Science Symposium. 2011

Role: Principle Investigator

Direct costs: \$20,000

## **IN THE MEDIA**

*A very small selection of examples drawn from many interviews, quotes and appearances*

### **RADIO**

NPR, November 16 2015. "Drink To Your Health: Study Links Daily Coffee Habit To Longevity"

(<http://www.npr.org/sections/thesalt/2015/11/16/456191657/drink-to-your-health-study-links-daily-coffee-habit-to-longevity>, accessed 1/30/16)

NPR, October 26 2015. "World Health Organization Report Links Red, Processed Meats To Cancer"

(<http://www.npr.org/2015/10/26/452012186/world-health-organization-report-links-red-processed-meats-to-cancer>, accessed 1/30/16)

**Big Picture Science, with Seth Shostak**, August 17 2015. “Fearing technology”.

(<http://blog.bigpicture-science.org/2015/08/big-picture-science-skeptic-seth-andrew-maynard-fearing-technology/>, accessed 1/30/16)

**The Next Idea with Cynthia Canty (Michigan Radio)**, April 23 2015. “Designers, engineers connect poetry to safer batteries” (<http://michiganradio.org/post/designers-engineers-connect-poetry-safer-batteries#stream/0> accessed 8/9/15)

**Big Picture Science, with Seth Shostak**, March 01 2015. “Skeptic Check: The Me in Measles”.

([http://bigpicture-science.org/episodes/Skeptic\\_Check\\_The\\_Me\\_in\\_Measles](http://bigpicture-science.org/episodes/Skeptic_Check_The_Me_in_Measles), accessed 8/9/15)

**Michigan Radio**, October 23 2014. “Here's why so few people get flu shots”.

<http://michiganradio.org/post/heres-why-so-few-people-get-flu-shots#stream/0> Accessed 8/9/15

**Big Picture Science with Seth Shostak**, October 19 2014. “Take of the Distribution”.

([http://bigpicture-science.org/episodes/Tale\\_of\\_the\\_Distribution](http://bigpicture-science.org/episodes/Tale_of_the_Distribution), accessed 8/9/15)

**The Environment Report**, October 31 2013. “Scientists pushed to engage the public through social media”.

(<http://michiganradio.org/post/scientists-pushed-engage-public-through-social-media> accessed 1/17/13).

**Lucy Ann Lance show**, January 3 2013. Talking about Risk Bites. (<http://lucyannlance.com/?p=30469>, accessed 11/30/13).

**Science Friday**, National Public Radio, May 23 2008. Guest on program: *Nanotube Safety*.

(<http://www.sciencefriday.com/program/archives/200805236>, accessed 9/7/08).

**Marketplace**, American Public Media, July 26, 2007. Expert on news item: *Nanoparticles in the Regulatory Spotlight*. (<http://www.marketplace.org/topics/tech/nanoparticles-regulatory-spotlight>, accessed 11/30/13).

**Morning Edition**, National Public Radio, March 13 2006. Lead interview on news item: *Safety of Nano-Cosmetics Questioned*. (<http://www.npr.org/templates/story/story.php?storyId=5257306>, accessed 9/7/08).

## TELEVISION

**Fox 2 News**, Jan 2 2013. Expert on news article: *Michigan professor uses YouTube to debunk 'winter hat' myth* (<http://www.myfoxdetroit.com/story/20485425/u-m-professor-debunks-winter-hat-myth>, accessed 1/17/13).

**Power of Small: Nanotechnology**. A series of three Fred Friendly Seminars, airing on PBS stations, 2008.

Panelist in the second program of the series: *Clean, Green and Unseen*.

(<http://powerofsmall.org/topicpages/environment.php>, accessed 9/7/08).

**ABC7 News San Francisco**, July 8 2008. Expert on news article: *Nanotechnology could pose health risks*.

(<http://abclocal.go.com/kgo/story?section=news/health&id=6253313>, accessed 9/7/08).

## PRINT/WEB

**Genetic Literacy Project**, December 17 2015. “*Cancer and the bad luck of random mutations*”

<https://www.geneticliteracyproject.org/2015/12/17/cancer-bad-luck-random-mutations/> Accessed 1/30/16

**IEEE Spectrum**, October 23 2015. “*Much Ado About Carbon Nanotubes...Or Not*”

<http://spectrum.ieee.org/nanoclast/semiconductors/materials/much-ado-about-carbon-nanotubes-or-not>  
Accessed 1/30/16

**Science News**, October 16 2015. “*Nanoparticles in foods raise safety questions*”

<https://www.sciencenews.org/article/nanoparticles-foods-raise-safety-questions> Accessed 1/30/16

**Grist** September 18 2015. *This video explains how those plastic bits in face washes, scrubs, and toothpastes can hurt ecosystems* <http://grist.org/living/this-video-explains-how-those-plastic-bits-in-face-washes-scrubs-and-toothpastes-can-hurt-ecosystems/> Accessed 1/30/16

**Crop Life International**, August 2015. *Meet the Risk and Hazard Guru*. <http://croplife.org/news/meet-the-risk-v-hazard-guru/> Accessed 8/9/15

**WebMD**, July 23 2015. *Nanoparticles: Small Size, Big Health Problems?*

<http://www.webmd.com/news/breaking-news/food-additives/20150723/nanoparticles-food-additives> Accessed

8/9/15

**New Yorker**, April 10 2015. *Roundup and Risk Assessment*. <http://www.newyorker.com/news/daily-comment/roundup-and-risk-assessment> Accessed 8/9/15

**Chemistry World**, April 9 2015. *Big problems with little particles?* <http://www.rsc.org/chemistryworld/2015/04/nanoparticle-toxicology> Accessed 8/9/15

**Grist**, February 12 2015. *Meet the man who tackles our fears with stick figures*. <http://grist.org/people/meet-the-man-who-tackles-our-fears-with-stick-figures/> Accessed 8/9/15

**Grist**, March 27 2015. *Watch stick figures explain what "probably causes cancer" even means*. <http://grist.org/science/watch-stick-figures-explain-what-probably-causes-cancer-even-means/> Accessed 8/9/15.

**Science (Science Careers Blog)**, October 15 2014 *Talking to the public about risk* [http://sciencecareers.sciencemag.org/career\\_magazine/previous\\_issues/articles/2014\\_10\\_15/caredit.a1400256](http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2014_10_15/caredit.a1400256) Accessed 8/9/15

**Boing Boing**, July 10 2014, *Is sunscreen dangerous? An actual scientist weighs in*. <http://boingboing.net/2014/07/10/is-sunscreen-dangerous-an-act.html> Accessed 8/9/15

**Bloomberg BNA**, May 15 2014, *Worker Illness After Nanomaterial Exposure Examined in First U.S. Case Study on Issue* <http://www.bna.com/worker-illness-nanomaterial-n17179890489/> Accessed 8/9/15

**Boing Boing**, November 27 2013, *23andMe vs. the FDA in less than 4 minutes* <http://boingboing.net/2013/11/27/23andme-vs-the-fda-in-less-th.html> Accessed 11/30/13

**io9**, November 27 2013, *University of Michigan's Risk Science Center offers a quick and handy explanation of the FDA's recent crackdown on personal genomics company 23andme* <http://io9.com/http-www-youtube-com-watch-v-vzxdttngduq-via-universi-1472753439> Accessed 11/30/13

**The Guardian**, August 18 2013, *Nanotech's Sunday best*

**Ann Arbor News (MLive)**, January 2 2013. *University of Michigan professor tackles 10 ways water can kill you and more in quirky video tutorials* <http://www.annarbor.com/entertainment/university-of-michigan-prof-tackles-10-ways-water-can-kill-you-and-more-in-quirky-video-tutorials/> Accessed 8/9/15

**USA Today**, January 1 2013, *Mich. professor's YouTube course is just right for many*. David Jesse.

**World Economic Forum**, January 9 2011, *Addressing global risks requires more sophisticated thinking on new technologies* <http://forumblog.org/2011/01/addressing-global-risks-requires-more-sophisticated-thinking-on-new-technologies-andrew-maynard-tim/> Accessed 11/30/13

**IEEE Spectrum**, June 6 2010. *Daring to Challenge NGOs on Nanotech Risk*. <http://spectrum.ieee.org/nanoclast/semiconductors/nanotechnology/daring-to-challenge-ngos-on-nanotech-risk> Accessed 11/30/13

**Seed Magazine**, April 6 2010. *Risks and Opportunities*. [http://seedmagazine.com/content/article/risk\\_and\\_opportunity/](http://seedmagazine.com/content/article/risk_and_opportunity/) Accessed 11/30/13

**Discovery Channel**, April 22 2009, *Nanotech Risks*. <http://youtu.be/qc0KLV8CW08> Accessed 11/30/13

**The Economist**, Nov 22 2007. *A little risky business*.

**Washington Post**, April 8 2006, Page A-01. *Nanotech raises worker safety questions*. Rick Weiss.