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EDUCATION

Ph.D., Philosophy, **Boston University**, January 1979.

A.M., Philosophy, **Boston University**, May 1973.

One year of graduate study in Physics, **Michigan State University**, 1970-71.

B.Sc., Physical Science, **Lyman Briggs College, Michigan State University**, March 1971 (area of specialization in Physics).

ACADEMIC, RESEARCH, AND ADMINISTRATIVE APPOINTMENTS

Affiliate, Notre Dame Center for Technology Ethics, **University of Notre Dame**, September 2019 to present.

Director, Reilly Center for Science, Technology, and Values, **University of Notre Dame**, July 2011 to June 2014.

Faculty Fellow, Nanovic Institute for European Studies, **University of Notre Dame**, October 2002 to 2020.

Director, Program in History and Philosophy of Science, **University of Notre Dame**, July 1997 to June 2007 and July 2008 to June 2011.

Reilly Fellow, **John J. Reilly Center for Science, Technology, and Values, University of Notre Dame**, November 1997 to present.

Professor, Department of Philosophy, **University of Notre Dame**, July 1997 to present.

Chair, Department of Philosophy, **University of Kentucky**, June 1993 to June 1997.

Professor, Department of Philosophy, **University of Kentucky**, July 1993 to June 1997.

Associate Professor, Department of Philosophy, **University of Kentucky**, July 1984 to June 1993 (on leave, 1985-87).

Research Associate, **Center for Einstein Studies, Boston University**, September 1985 to present.

Assistant Editor, **The Collected Papers of Albert Einstein**, September 1985 to March 1986, and 1 January 1987 to 15 July 1987.

Research Associate, **Center for the Philosophy and History of Science, Boston University**, September 1985 to August 1987.

Fellow in the **Society of Fellows in the Humanities**, and Lecturer in the Department of Philosophy, **Columbia University**, July 1980 to June 1981.

Assistant Professor, Department of Philosophy, **University of Kentucky**, August 1978 to June 1984 (on leave, 1980-81).

Visiting Lecturer, Department of Philosophy, **University of Lowell**, September 1977 to July 1978.

Lecturer, Department of English and Humanities, **Western New England College**, September 1976 to June 1977.

Teaching Assistant, Department of Physics, **Michigan State University**, September 1970 to June 1971.

GRANTS, FELLOWSHIPS, AND HONORS

College of Arts and Sciences Distinguished Lecturer, Indiana University-Purdue University, Fort Wayne, IN, October 23, 2015.

National Science Foundation, Cultivating Cultures for Ethical STEM Grant, No. SES 1449469, “Cultivating Leaders for Ethical STEM,” January 2015-December 2019. To support ethics training for Notre Dame graduate students. Co-PI with Laura Carlson, John Lubker, and Melinda Gormley.

National Science Foundation, Ethics Education in Science and Engineering Grant, No. DMR 1338652, “Citizen-Scientists as Agents of Change: Training the Trainer in the Ethics of Science and Technology,” July 2014-August 2019. To support research ethics training for Notre Dame graduate students.

Distinguished Alumnus Award, Lyman Briggs College, Michigan State University, 2011

Fellow, American Physical Society, 2007.

National Science Foundation, Research Grant, No. SES-0724550, “Scientific Philosophy: Its Origins and Development, 1850 to 1950,” January 2008-August 2008. To support research and book writing.

University of Notre Dame, Kaneb Teaching Award, May 2004.

Thyssen-Stiftung and Zentrum für interdisziplinäre Forschung, Universität Bielefeld, Conference grants to support the Notre-Dame - Bielefeld Interdisciplinary Conference on Science and Values, Universität Bielefeld, 9-12 July 2003.

University of Kentucky, University Research Professorship, 1992-1993.

University of Kentucky, Office of the Vice-Chancellor for Research and Graduate Studies, Equipment Grant, March 1992.

Gaines Center for the Humanities, University of Kentucky, Undergraduate Research Assistantship, Spring 1989. To support appointment of distinguished undergraduate student as research assistant.

University of Kentucky, Faculty Award, 1988-1991. Three-year grant in recognition of outstanding research accomplishments.

Ford Foundation, Curriculum development grant, “Literacy and the Liberal Arts: The Development of Student Literacy through Cross-Disciplinary Courses,” 1986-1988. To support development of “paired” courses in the new general studies curriculum. [Co-participant.]

American Philosophical Society, Research Grant, “Einstein as a Philosopher of Science: The Historical Background,” March-June 1986. To support research at the Zentralbibliothek and the ETH Bibliothek, Zurich.

Deutscher akademischer Austauschdienst (German Academic Exchange Service), Study Visit Grant, “Einstein as a Philosopher of Science: The Philosophical and Scientific Background,” March-April 1986. To support research at the Deutsches Museum, Munich, and travel to lecture at German universities.

University of Kentucky Research Foundation, Research Grant, May-June 1986. To support research on Einstein in the German Democratic Republic.

National Science Foundation, Research Grant, No. SES-8420140, “Einstein as a Philosopher of Science,” March 1985 to December 1986. To support research for a book on Einstein’s philosophy of science.

University of Kentucky Research Foundation, Major Research Equipment Grant, November 1984. For purchase of microcomputer, peripherals, and software, for use in research on Einstein’s philosophy of science.

University of Kentucky Research Foundation, Research Grant, January 1984. To support research at the Einstein Archive, Princeton.

National Academy of Sciences, Travel Grant, July 1983. For travel to deliver a paper at the 7th International Congress for Logic, Methodology, and Philosophy of Science, Salzburg, Austria.

Columbia University, Society of Fellows in the Humanities, Mellon Post-Doctoral Fellowship, August 1980 to June 1981.

University of Kentucky Research Foundation, Summer Research Fellowship, 1979.

Woodrow Wilson Fellow, 1971-72.

National Science Foundation, Graduate Fellowship, 1971-74.

Graduated with **High Honor**, Michigan State University, 1971.

Member of **Honors College**, Michigan State University, 1968-71.

Armco Steel Foundation, Scholarship, 1967-71.

SUMMER SCHOOLS

Co-Lecturer with Peter Takacs, “Beijing International Summer School on Philosophy of Science,” **Beijing, China**, June 24-July 14, 2024. (A Notre Dame – Peking University Joint Program, in collaboration with the Notre Dame Beijing Global Gateway Center.)

Co-director with Paola Crippa, “The Environment: Science, Policy, and Ethics” Summer Seminar, Office of Pre-College Programs, **University of Notre Dame**, 14-23 July 2019; 19-27 July 2021.

Lecturer, XVIII International Summer School in Philosophy of Physics, “Einstein Philosopher-Scientist. A celebration for 100 years of General Theory of Relativity,” **Cesena/Urbino, Italy**, 7-11 September 2015.

Co-director with Jessica Baron, “Science, Ethics, and Responsibility” Summer Seminar, Office of Pre-College Programs, **University of Notre Dame**, 21-30 July 2013; 20-29 July 2014; 19-28 July 2015; 18-26 July 2016; 17-25 July 2017; 16-24 July 2018.

Lecturer, summer school on “Einstein’s Philosophy of Science,” Forum Scientiarum, **Tübingen University**, 30 July - 3 August 2012.

Principal Lecturer, with Elliott Sober, at the Vienna International Summer University—Scientific World Conceptions, “Unity and Plurality in Science,” **University of Vienna**, 16–28 July 2001.

PUBLICATIONS

a. Books

Anche Einstein gioca a dadi. La lunga lotta con la meccanica quantistica. Vincenzo Fano and Isabella Tassani, eds. and trans. Rome: Carocci Editore, 2015.

Scientific Philosophy: Its Origins and Development, 1850 to 1950. Routledge. In Preparation.

Einstein as a Philosopher of Science. Chicago: University of Chicago Press. In preparation.

Complementarity and Ontology: Niels Bohr and the Problem of Scientific Realism in Quantum Physics. Dissertation. Boston University, 1979. Ann Arbor, Michigan: University Microfilms International.

b. Edited Volumes

- The Collected Papers of Albert Einstein*. Vol. 17. *The Berlin Years: Writings and Correspondence, June 1929–November 1930*. Ccontributing Editor. With Diana Kormos Buchwald, Ze'ev Rosenkranz, Joshua T. Eisenthal, József Illy, Daniel J. Kennefick, A. J. Kox, Jennifer L. Rodgers, Tilman Sauer, Barbara Wolff, Emily de Araújo, Jacquelyn Bussone, Sinikka Elvington, Jennifer Nollar James, and Jim Ritter. Princeton: Princeton University Press, 2024 (Forthcoming.).
- Seeking Consonance: Christian Theology and Natural Science*. Ernan McMullin. Don Howard and John Slattery, eds. New York: Oxford University Press. In preparation.
- Integrated History and Philosophy of Science in Practice. &HPS4*. Athens, 15-18 March 2012. With Theodore Arabatzis. A special issue of *Studies in History and Philosophy of Science*. 50 (2015).
- The Challenge of the Social and the Pressure of Practice: Science and Values Revisited*. With Martin Carrier and Janet Kourany. Pittsburgh: University of Pittsburgh Press, 2008.
- Revisiting the Foundations of Relativistic Physics: Festschrift in Honor of John Stachel*. With Abhay Ashtekar, Robert S. Cohen, Jürgen Renn, Sahotra Sarkar, and Abner Shimony. Boston Studies in the Philosophy of Science, no. 234. Dordrecht, Boston, and London: Kluwer, 2004.
- History of Science and Philosophy of Science: HOPOS 2002*. Montreal, 21-23 June 2002. With Alan Richardson. A special issue of *Perspectives on Science: Historical, Philosophical, Social* 11, no. 1 (Spring 2003).
- PSA98. Part I, *Contributed Papers*. Proceedings of the 1998 Biennial Meeting of the Philosophy of Science Association, Kansas City, Missouri, October 22-24, 1998. A special issue of *Philosophy of Science* 66 (1999).
- PSA98. Part II, *Symposium Papers*. Proceedings of the 1998 Biennial Meeting of the Philosophy of Science Association, Kansas City, Missouri, October 22-24, 1998. A special issue of *Philosophy of Science* 67 (2000).
- Selections from the First International Conference on the History of the Philosophy of Science*. Roanoke, Virginia, 19-21 April 1996. With Eric Palmer. A special issue of *Perspectives on Science: Historical, Philosophical, Social* 5, no. 3 (Fall 1997).
- The Collected Papers of Albert Einstein*. Vol. 2, *The Swiss Years: Writings, 1901-1909*. Assistant Editor. With John Stachel, Robert Schulmann, David Cassidy, Jürgen Renn, and A. J. Kox. Princeton: Princeton University Press, 1989.
- The Collected Papers of Albert Einstein*. Vol. 3, *The Swiss Years: Writings, 1909-1912*. Contributing Editor. With Martin Klein, Robert Schulmann, Jürgen Renn, A. J. Kox, and others. Princeton: Princeton University Press, 1994.

c. Series Editor

Einstein Studies. A series of occasional volumes published under the sponsorship of the Center for Einstein Studies, Boston University. Published by Birkhäuser/Springer. Co-edited with Diana Kormos Buchwald.

Vol. 1: *Einstein and the History of General Relativity*. Proceedings of the 1986 Osgood Hill Conference, North Andover, Massachusetts, 8-11 May 1986. Don Howard and John Stachel, eds. 1989.

Vol. 2: *Conceptual Problems of Quantum Gravity*. Proceedings of the 1988 Osgood Hill Conference, North Andover, Massachusetts, 16-19 May 1988. Abhay Ashtekar and John Stachel, eds. 1991.

Vol. 3: *Studies in the History of General Relativity*. Proceedings of the Second International Conference, Marseilles-Luminy, France, 6-9 September 1988. Jean Eisenstaedt and A.J. Kox, eds. 1992.

Vol. 4: *Recent Advances in General Relativity*. Proceedings of a Conference to Honor E. T. Newman during the Academic Year of His 60th Birthday. University of Pittsburgh, 3-5 May 1990. Abhay Ashtekar, ed. 1992.

Vol. 5: *The Attraction of Gravitation: New Studies in the History of General Relativity*. Proceedings of the Third International Conference, University of Pittsburgh at Johnstown, 27-30 June 1991. John Earman, Michel Janssen, and John Norton, eds. 1994.

Vol. 6: *Mach's Principle: From Newton's Bucket to Quantum Gravity*. Based on the Proceedings of the Conference at Tübingen, Germany, 26-30 July 1993. Julian Barbour and Herbert Pfister, eds. 1995.

Vol. 7: *History of General Relativity IV: The Expanding Worlds of General Relativity*. Based upon the Fourth International Conference, Berlin, Germany 31 July-3 August 1995. Hubert Goenner, Jürgen Renn, Jim Ritter, and Tilman Sauer, eds. 1999.

Vol. 8: *Einstein, the Formative Years, 1879-1909*. Based upon the 1990 Osgood Hill Conference, North Andover, Massachusetts, 4-6 October 1990. Don Howard and John Stachel, eds. 2000.

Vol. 9: John Stachel. *Einstein from 'B' to 'Z.'* 2002.

Vol. 10: *Einstein Studies in Russia*. Yuri Balashov and Vladimir Vizgin, eds. 2002.

Vol. 11: *The Universe of General Relativity*. A. J. Kox and Jean Eisenstaedt, eds. 2005.

Vol. 12: *Einstein and the Changing Worldviews of Physics*. Christoph Lehner, Jürgen Renn, and Matthias Schemmel, eds. 2011.

Vol. 13: *Towards a Theory of Spacetime Theories*. Dennis Lehmkuhl, ed. 2017.

Vol. 14: *Beyond Einstein*. Based upon the conference, "Beyond Einstein," Johannes Gutenberg University, Mainz Germany, 22-26 September 2008. David Rowe, ed. 2018.

Vol. 15: *Thinking about Space and Time: 100 Years of Applying and Interpreting General Relativity*. Based upon the conference, “Thinking about Space and Time: 100 Years of Applying and Interpreting General Relativity,” Bern, Switzerland, 12-14 September 2017. Claus Beisbart, Tilman Sauer, and Christian Wüthrich, eds. 2020.

Vol. 16 : *The Renaissance of General Relativity in Context*. Jürgen Renn and Alexander Blum, eds. 2020.

Vol. 17: *Einstein at Work on Unified Field Theory: The Five-Dimensional Einstein-Bergmann Approach*. Tobias Schütz. 2024. (Forthcoming.)

Vol. 18: *Essays in Honor of Yakir Aharonov*. Daniel Struppa and Jeff Tollaksen, eds. (Forthcoming.)

d. Journal Editor

Co-editor with Sebastián Murgueitio of the digital edition of *Epistemological Letters*. <<https://curate.nd.edu/show/ks65h992w12>>

Co-editor with Rose-Mary Sargent and Menachem Fisch of *HOPOS—The Journal of the International Society for the History of Philosophy of Science*, University of Chicago Press. 2011-2016.

e. Papers

“Artificial Intelligence in Strategic Planning and Military Operations: Ethical Considerations.” Peace Research Institute of Oslo Research Paper, 2024. (Co-authored with August Cole, Robert Latiff, George Lucas, Gregory Reichberg, and Kaushik Roy.) <https://www.prio.org/publications/13815>

“Integrated History and Philosophy of Science. In *Routledge Handbook of the History of Philosophy of Science*. Flavia Padovani and Adam Tamas Tuboly. New York: Routledge (forthcoming 2024). (Forthcoming 2024.)

“Quine, Dewey, and the Pragmatist Tradition in American Philosophy of Science.” In *Values, Pluralism, and Pragmatism: Themes from the Work of Matthew J. Brown*. Jonathan Tsou, ed. Boston Studies in the Philosophy and History of Science. Cham, Switzerland: Springer. (Forthcoming 2024.)

“Einstein, ‘Cosmic Religion,’ and Theology.” In *Divined Explanations: The Theological and Philosophical Backdrop to the Development of the Sciences (1600-2000)*. Flavia Marcacci and Paul Allen, eds. Leiden: Brill (forthcoming 2024).

“Scientism and Atheistic Ideology: Challenges and Responses by Christians and Muslims.” (Co-authored with Waleed Azhar and Usman Ahmad.) *NUQTAH Journal of Theological Studies* (Pakistan) 3 (2023), 18-35.

“In Defense of (Virtuous) Autonomous Weapons.” *Dakota Digital Review*. Spring/Summer 2023, 9-17. (An abbreviated version of the foregoing paper.)

- “In Defense of (Virtuous) Autonomous Weapons.” *Notre Dame Journal on Emerging Technologies*, 3,2 (November 2022). <https://ndlsjnet.com/in-defense-of-virtuous-autonomous-weapons/>.
- “The Copenhagen Interpretation.” In *The Oxford Handbook of the History of Quantum Interpretations*. Olival Freire, et al., eds. Oxford: Oxford University Press, 2022, 521-542.
- “Whence and W(h)ither Technology Ethics.” In *The Oxford Handbook of Philosophy of Technology*. Shannon Vallor, ed. Oxford: Oxford University Press, 2022, 78-101.
- “The Obligation to Act.” *American Scientist* 100 (2021), 203-205.
- “The Philosopher Physicists: Albert Einstein and Philipp Frank.” In *Logical Empiricism and the Physical Sciences: From Philosophy of Nature to Philosophy of Physics*. Sebastian Lutz and Adam Tamas Tuboly, eds. New York: Routledge, 2021, 121-156.
- “Short-term and Long-term Health Impacts of Air Pollution Reductions from COVID-19 Lockdowns in China and Europe: A Modelling Study. (With Paolo Giani, Stefano Castrucci, Alessandro Anav, Wenjing Hu, and Paola Crippa.) *The Lancet Planetary Health*. 22 September 2020. DOI:[https://doi.org/10.1016/S2542-5196\(20\)30224-2](https://doi.org/10.1016/S2542-5196(20)30224-2).
- “Complementarity and Decoherence.” In *Quantum Arrangements*. Gregg Jaeger et al., eds. New York: Springer, 2021, 151-175.
- “The Moral Imperative of Green Nuclear Energy Production.” *Notre Dame Journal on Emerging Technologies* 1 (2020), 64-91.
- “A Philosopher's Field Guide to Talking with Engineers.” In *Philosophy for the Real World: An Introduction to Field Philosophy with Case Studies and Practical Strategies*. Evelyn Brister and Robert Frodeman, eds. Abingdon, England: Routledge, 2020, 209-221.
- “Epistemological Letters Introduction.” *Epistemological Letters* (digital edition), 2019. <<https://curate.nd.edu/downloads/p2676t08c63>>
- “How General Relativity Shaped Twentieth-Century Philosophy of Science.” In *Einstein Was Right: The Science and History of Gravitational Waves*. Jed Z. Buchwald, ed. Princeton, NJ: Princeton University Press, 2020, 149-196.
- “Einstein’s Philosophy of Science.” Revised. With Marco Giovanelli. *The Stanford Encyclopedia of Philosophy* (2019), Edward N. Zalta, ed., <<http://plato.stanford.edu/entries/einstein-philscience>>
- “Otto Neurath: The Philosopher in the Cave.” In *Neurath Reconsidered: New Sources and Perspectives*. Jordi Cat and Adam Tamas Tuboly, eds. Basel: Springer, 2019, 45-65.
- “The Silver Lining in Gain-of-Function Experiments with Pathogens of Pandemic Potential.” (Co-authored with Arturo Casadevall and Michael Imperiale.) In *Methods in Molecular Biology, Influenza Methods & Protocols*. Yohei Yamauchi, ed. New York: Springer, 2018, 575-587.

- “Technomoral Civic Virtues: A Critical Appreciation of Shannon Vallor’s Technology and the Virtues.” *Philosophy & Technology*. 31 (1918), 293-304.
- “Artificial Moral Cognition: Moral Functionalism and Autonomous Moral Agency.” (Co-authored with Ioan Muntean.) *Philosophy and Computing*. Thomas Powers, ed. Cham, Switzerland: Springer, 2017, 121-159.
- “Civic Virtue and Cybersecurity.” In *The Nature of Peace & the Morality of Armed Conflict*. Florian Demont-Biaggi, ed. Basingstoke, England: Palgrave Macmillan, 2017, 181-200.
- “The Artificial Autonomous Moral Agent (AAMA): A Minimalist Model.” (Co-authored with Ioan Muntean.) In *Proceedings of the AAAI 2016 Spring Symposium on Ethical and Moral Considerations in Nonhuman Agents*. AAAI Press, 2016. <https://www.aaai.org/ocs/index.php/SSS/SSS16/paper/view/12760>.
- “Introduction: Integrated History and Philosophy of Science in Practice.” (Co-authored with Theodore Arabatzis.) In *Integrated History and Philosophy of Science in Practice. &HPS4*. Athens, 15-18 March 2012. (Co-edited with Theodore Arabatzis.) A special issue of *Studies in History and Philosophy of Science*. 50 (2015), 1-3.
- “A Code of Ethics for the Human-Robot Interaction Profession.” (Co-authored with Laurel Riek.) *Proceedings of We Robot*, 2014. SSRN <<https://ssrn.com/abstract=2757805>>
- “Artificial Moral Agents: Creative, Autonomous and Social. An Approach Based on Evolutionary Computation.” (Co-authored with Ioan Muntean.) In *Sociable Robots and the Future of Social Relations*. Johanna Seibt, Raul Hakli, and Marco Nørskov, eds. Amsterdam: IOS Press, 2014, 217-230.
- “Einstein and the Development of Twentieth-Century Philosophy of Science.” In *The Cambridge Companion to Einstein*. Michel Janssen and Christoph Lehner, eds. New York: Cambridge University Press, 2014, pp. 354-376.
- “Virtue and Cyberconflict.” In *The Ethics of Information Warfare*. Luciano Floridi and Mariarosaria Taddeo, eds. London: Springer, 2014, pp. 155-168.
- “Quantum Mechanics in Context: Pascual Jordan’s 1936 Anschauliche Quantentheorie.” In *Research and Pedagogy: A History of Quantum Physics through Its Textbooks*. Massimiliano Badino and Jaime Navarro, eds. Berlin: Editions Open Access, 2013, pp. 265-283.
- “Quine, Dewey, and the Pragmatist Tradition in American Philosophy of Science.” (In manuscript.)
- “Popper and Bohr on Realism in Quantum Mechanics.” *QUANTA* 1 (2012), 33-57. <<http://dx.doi.org/10.12743%2Fqanta.v1i1.9>>
- “Reference from a Behaviorist Point of View.” In *Perception, Realism, and the Problem of Reference*. Athanasios Raftopoulos, ed. Cambridge: Cambridge University Press, 2012, pp. 183-211.

- “Are Elementary Particles Individuals? A Critical Appreciation of Steven French and Décio Krause’s *Identity in Physics: A Historical, Philosophical, and Formal Analysis*.” *Metascience* 20 (2011), 225-231.
- “Philosophy of Science and the History of Science.” In *The Continuum Companion to the Philosophy of Science*. Steven French and Juha Saatsi, eds. London and New York: Continuum, 2011, pp. 55-71.
- “‘Let me briefly indicate why I do not find this standpoint natural.’ Einstein, General Relativity, and the Contingent A Priori.” In *Discourse on a New Method: Reinvigorating the Marriage of History and Philosophy of Science*. Michael Dickson and Mary Domski, eds. Chicago: Open Court, 2010, pp. 333-355.
- “The Trouble with Metaphysics.” (In manuscript.)
- “Revisiting the Einstein-Bohr Dialogue.” On *ScientificBlogging*. 8 January 2009. <http://www.scientificblogging.com/don_howard/revisiting_einsteinbohr_dialogue>
- “Passion at a Distance.” In *Quantum Reality, Relativistic Causality, and Closing the Epistemic Circle: Essays in Honour of Abner Shimony*. Wayne C. Myrvold and Joy Christian, eds. New York: Springer, 2009, pp.3-11.
- “Physics as Theodicy.” In *Physics and Cosmology: Scientific Perspectives on the Problem of Natural Evil*. Nancey Murphy, Robert Russell, and William Stoeger, S.J., eds. Vatican City: Vatican Observatory; Berkeley: Center for Theology and the Natural Science, 2007, pp. 323-332.
- “‘No Crude Surfeit’: A Critical Appreciation of *The Reign of Relativity*.” (In manuscript.)
- “Politics and the Philosophy of Science in the Nineteenth Century: Suggestions for an Agenda. (In manuscript.)
- “Better Red than Dead – Putting an End to the Social Irrelevance of Postwar Philosophy of Science.” *Science and Education* 18 (2009), 199-220.
- “Albert Einstein as a Philosopher of Science.” In *E = Einstein: His Life, His Thought, and His Influence on Our Culture*. Donald Goldsmith and Marcia Bartusiak, eds. New York: Sterling, 2006, 67-80.
- “Reduction and Emergence in the Physical Sciences: Some Lessons from the Particle Physics and Condensed Matter Debate.” In *Evolution and Emergence: Systems, Organisms, Persons*. Nancey Murphy and William R. Stoeger, S.J., eds. Oxford: Oxford University Press, 2007, pp. 141-157.
- “Revisiting the Einstein-Bohr Dialogue.” *Iyyun: The Jerusalem Philosophical Quarterly* 56 (2007), 57-90. Special issue of dedicated to the memory of Mara Beller.
- 作为科学哲学家的爱因斯坦“Albert Einstein as a Philosopher of Science”. *科学文化评论* (*Science and Culture Review – China*) 36 (2006), 37-49.

科学哲学者としてのアインシュタイン (“Albert Einstein as a Philosopher of Science.”) パリティ
(*Parity – Japan*) 21, no.8 (2006), 14-24.

“Lost Wanderers in the Forest of Knowledge: Some Advice on How to Think about the Relation between Discovery and Justification.” In *Revisiting Discovery and Justification: Historical and Philosophical Perspectives on the Context Distinction*. Jutta Schickore and Friedrich Steinle, eds. Dordrecht: Springer, 2006, pp. 3-22.

“Albert Einstein as a Philosopher of Science.” *Physics Today* 58, no. 11 (2005): 34-40.

“Einstein’s Philosophy of Science.” *The Stanford Encyclopedia of Philosophy* (2004), Edward N. Zalta, ed., <<http://plato.stanford.edu/entries/einstein-philsience>>

“Fisica e filosofia della scienza all’alba del XX secolo.” [“Physics and Philosophy of Science at the Turn of the Twentieth Century.”] In *Storia della scienza*. Vol. 8, *La Seconda rivoluzione scientifica*. Umberto Bottazzini, John L. Heilbron, Gilberto Corbellini, and Daniel J. Kevles, eds. Rome: Istituto della Enciclopedia Italiana, 2004, pp. 3-16.

“Who Invented the Copenhagen Interpretation? A Study in Mythology.” *PSA 2002*. Part II, *Symposium Papers*. Proceedings of the 2002 Biennial Meeting of the Philosophy of Science Association, Milwaukee, Wisconsin, November 7-9, 2002. A special issue of *Philosophy of Science* 71 (2004): 669-682.

“Two Left Turns Make a Right: On the Curious Political Career of North American Philosophy of Science at Mid-century.” In *Logical Empiricism in North America*. Alan Richardson and Gary Hardcastle, eds. Minneapolis: University of Minnesota Press, 2003, pp. 25-93.

“Lost Wanderers in the Forest of Knowledge: Some Advice on How to Think about the Relation between Discovery and Justification.” In *Revisiting Discovery and Justification*. Max-Planck-Institut für Wissenschaftsgeschichte, Preprint 211. Berlin: 2002, pp. 41-58.

“Point Coincidences and Pointer Coincidences: Einstein on Invariant Structure in Spacetime Theories.” In *History of General Relativity IV: The Expanding Worlds of General Relativity*. Based upon the Fourth International Conference, Berlin, Germany 31 July-3 August 1995. Hubert Goenner, Jürgen Renn, Jim Ritter, and Tilman Sauer, eds., Boston: Birkhäuser, 1999, pp. 463-500.

“Astride the Divided Line: Platonism, Empiricism, and Einstein’s Epistemological Opportunism.” In *Idealization in Contemporary Physics*. Niall Shanks, ed. Poznan Studies in the Philosophy of the Sciences and the Humanities, vol. 63. Amsterdam and Atlanta: Rodopi, 1998, pp. 143-163.

“Spacetime and Separability: Problems of Identity and Individuation in Fundamental Physics.” In *Potentiality, Entanglement, and Passion-at-a-distance: Quantum Mechanical Essays in Honor of Abner Shimony*, vol. 2. Robert S. Cohen, Michael Horne, and John Stachel, eds. Boston: Kluwer, 1997, pp. 113-141.

- “The History that We Are: Philosophy as Discipline and the Multiculturalism Debate.” In *Cross-Cultural Conversation (Initiation)*. Proceedings of the Symposium on “Cross-Cultural Conversations,” Centre for Cultural Research, Aarhus University, Denmark, 26-27 May 1994. Anindita Balslev, ed. American Academy of Religion Cultural Criticism Series, no. 5. Cleo McNelly Kearns, ed. Atlanta: Scholars Press, 1996, pp. 43-76.
- “Relativity, *Eindeutigkeit*, and Monomorphism: Rudolf Carnap and the Development of the Categoricity Concept in Formal Semantics.” In *Origins of Logical Empiricism*. Ronald N. Giere and Alan Richardson, eds. Minnesota Studies in the Philosophy of Science, vol. 16. Minneapolis and London: University of Minnesota Press, 1996, pp. 115-164.
- “A Peek behind the Veil of Maya: Einstein, Schopenhauer, and the Historical Background of the Conception of Space as a Ground for the Individuation of Physical Systems.” In *The Cosmos of Science: Essays of Exploration*. John Earman and John D. Norton, eds. Pittsburgh-Konstanz Series in the Philosophy and History of Science, vol. 6. Pittsburgh: University of Pittsburgh Press; Konstanz: Universitätsverlag, 1997, pp. 87-150.
- “‘A kind of vessel in which the struggle for eternal truth is played out’—Albert Einstein and the Role of Personality in Science.” In *The Natural History of Paradigms: Science and the Process of Intellectual Evolution*. John H. Langdon and Mary E. McGann, eds. Indianapolis: University of Indianapolis Press, 1994, pp. 111-138.
- “What Makes a Classical Concept Classical? Toward a Reconstruction of Niels Bohr’s Philosophy of Physics.” In *Niels Bohr and Contemporary Philosophy*. Jan Faye and Henry Folse, eds. Boston Studies in the Philosophy of Science. Boston: Kluwer, 1994, pp. 201-229.
- “Einstein fu davvero un realista?” In *Realismo/Antirealismo: Aspetti del dibattito epistemologico contemporaneo*. Alessandro Pagnini, ed. Florence: La Nuova Italia, 1995, pp. 93-141.
- “Was Einstein Really a Realist?” *Perspectives on Science: Historical, Philosophical, Social* 1 (1993), 204-251.
- “Locality, Separability, and the Physical Implications of the Bell Experiments: A New Interpretation.” In *Bell’s Theorem and the Foundations of Modern Physics*. Proceedings of the 1991 Conference, 7-10 October, Cesena, Italy. A. van der Merwe, F. Selleri, and G. Tarrozi, eds. Singapore: World Scientific, 1993, pp. 306-314.
- “Out of the Labyrinth? Einstein, Hertz, and the Göttingen Answer to the Hole Argument.” Coauthored with John Norton. In *The Attraction of Gravitation: New Studies in the History of General Relativity*. Proceedings of the Third International Conference, University of Pittsburgh at Johnstown, 27-30 June 1991. John Earman, Michel Janssen, and John Norton, eds. Boston: Birkhäuser, 1994, pp. 30-62.
- “Einstein, Kant, and the Origins of Logical Empiricism.” In *Language, Logic, and the Structure of Scientific Theories*. Proceedings of the Carnap-Reichenbach Centennial, University of Konstanz, 21-24 May 1991. Wesley Salmon and Gereon Wolters, eds. Pittsburgh: University of Pittsburgh Press; Konstanz: Universitätsverlag, 1994, pp. 45-105.

- “Old Quine in New Bottles: Empiricism, Naturalism, and Antifoundationalism in the Study of Science.” (In manuscript).
- “Einstein and Duhem.” In *Pierre Duhem: Historian and Philosopher of Science*. Proceedings of the Conference at Virginia Polytechnic Institute and State University, Blacksburg, Virginia, 16-18 March 1989. Roger Ariew and Peter Barker, eds. *Synthese* 83 (1990), 363-384.
- “The Ultimate Refutation of Realism: Noncategoricity and the Unique Representation of Reality.” (In manuscript.)
- “‘Nicht sein kann was nicht sein darf,’ or the Prehistory of EPR, 1909-1935: Einstein’s Early Worries about the Quantum Mechanics of Composite Systems.” In *Sixty-Two Years of Uncertainty: Historical, Philosophical, and Physical Inquiries into the Foundations of Quantum Mechanics*. Proceedings of the 1989 Conference, “Ettore Majorana” Centre for Scientific Culture, International School of History of Science, Erice, Italy, 5-14 August 1989. Arthur Miller, ed. New York: Plenum, 1990, pp. 61-111.
- “Einstein and *Eindeutigkeit*: A Neglected Theme in the Philosophical Background to General Relativity.” In *Studies in the History of General Relativity*. Proceedings of the Second International Conference, Marseilles-Luminy, France, 6-9 September 1988. Jean Eisenstaedt and A. J. Kox, eds. Boston: Birkhäuser, 1992, pp. 154-243.
- “Holism, Separability, and the Metaphysical Implications of the Bell Experiments.” In *Philosophical Consequences of Quantum Theory: Reflections on Bell’s Theorem*. James T. Cushing and Ernan McMullin, eds. Notre Dame, Indiana: University of Notre Dame Press, 1989, pp. 224-253.
- “Einstein on Locality and Separability.” *Studies in History and Philosophy of Science* 16 (1985), 171-201.
- “How to Naturalize Epistemology: Outlines of an Operant Theory of Knowledge.” (In manuscript.)
- “Realism and Conventionalism in Einstein’s Philosophy of Science: The Einstein-Schlick Correspondence.” *Philosophia Naturalis* 21 (1984), 618-29.
- “Objectivity and Realism: A Critique of Popper’s Interpretation of Quantum Mechanics.” (In manuscript.)
- “Commoner on Reductionism.” *Environmental Ethics* 1 (1979), 159-76.

e. Review Essays

- “Time for a Moratorium? Isaacson, Einstein, and the Challenge of Scientific Biography.” A review of Walter Isaacson. *Einstein: His Life and Universe*. New York: Simon & Schuster, 2007. *Journal of Historical Biography* 3 (Spring 2008), 124-133.
- Hugh LaFollette and Niall Shanks. *Brute Science: Dilemmas of Animal Experimentation*. New York: Routledge, 1996. *Metascience* (7) 1998), 260-272.

f. Book Reviews

- Matthias Neuber and Adam Tamas Tuboly, eds. *Ernest Nagel: Philosophy of Science and the Fight for Clarity*. Cham, Switzerland: Springer, 2022. *Philosophy of Science* (forthcoming).
- “Albert Einstein’s Year in Prague.” A review of: Michael D. Gordin. *Einstein in Bohemia*. Princeton, NJ: Princeton University Press, 2020. *Physics Today* 73 (October 2020), 58-59.
- “Science and Philosophy in the Shadow of War.” A review of: Karl Sigmund. *Exact Thinking in Demented Times: The Vienna Circle and the Epic Quest for the Foundations of Science*. New York: Basic Books, 2017. *Physics Today* 71 (June 2018), 53-54.
- “Albert Einstein: Thinker and Tinker.” A review of: Steven Gimbel. *Einstein’s Jewish Science: Physics at the Intersection of Politics and Religion*. Baltimore: Johns Hopkins University Press, 2012; József Illy. *The Practical Einstein: Experiments, Patents, Inventions*. Baltimore: Johns Hopkins University Press, 2012. *Physics Today*. January 2013, 42-43.
- Louisa Gilder. *The Age of Entanglement: When Quantum Physics was Reborn*. New York: Knopf, 2008; Manjit Kumar. *Einstein, Bohr, and the Great Debate about the Nature of Reality*. Cambridge: Icon, 2008. *Nature* 456, no. 7223 (11 December 2008), 706-707.
- Emilio Segrè. *Faust in Copenhagen: The Struggle for the Soul of Physics and the Birth of the Nuclear Age*. London: Jonathan Cape, 2007. *Physics World*. 20, no. 11 (November 2007), 44-45.
- Albrecht Fölsing. *Albert Einstein: A Biography*. New York: Viking, 1997. Dennis Brian. *Einstein: A Life*. New York: Wiley, 1996. *Science* 278 (14 November 1997), 1241-1242.
- Arthur Fine. *The Shaky Game: Einstein, Realism, and the Quantum Theory*, 2nd ed. Chicago: University of Chicago Press, 1988. *Synthese* 86 (1991), 123-141.
- Arthur Fine, *The Shaky Game: Einstein, Realism, and the Quantum Theory*. Chicago: University of Chicago Press, 1986. *Science* 238 (1987), 409-410.
- Gereon Wolters, *Mach I, Mach II, Einstein und die Relativitätstheorie. Eine Fälschung und ihre Folge*. Berlin and New York: Walter de Gruyter, 1987. *Isis* 78 (1987), 606-607.
- A. P. French and P. J. Kennedy, eds., *Niels Bohr: A Centenary Volume*. Cambridge, Massachusetts: Harvard University Press, 1985. *Annals of Science* 44 (1987), 196-98.
- Henry J. Folse, *The Philosophy of Niels Bohr: The Framework of Complementarity*. Amsterdam: Elsevier, 1985. *Isis* 77 (1986), 117-18.
- Norman Stockman, *Antipositivist Theories of the Sciences*. Dordrecht, Holland: Reidel, 1983. *Review of Metaphysics* 39 (1985), 377-78.
- Roman U. Sexl, ed. *Ludwig Boltzmann Gesamtausgabe*. Vol. 8. *Internationaler Tagung, 5.-8. September 1981: Ausgewählte Abhandlungen*. Ed. Roman U. Sexl and John Blackmore. Graz: Akademische Druck- u. Verlagsanstalt, 1983. *Isis* 75 (1984), 621.
- Anton Dumitriu, *History of Logic*. 4 Vols. Tunbridge, Kent: Abacus Press, 1977. *Journal of the History of Philosophy* 20 (1982), 101-6. (With Alan Perreiah.)

g. Translations

Consultant to Princeton University Press on the English Translation volumes accompanying volumes 3 through 5 of *The Collected Papers of Albert Einstein*:

The Collected Papers of Albert Einstein. Vol. 3, *The Swiss Years: Writings, 1909-1912. English Translation*. Consultant. Anna Beck, trans. Princeton: Princeton University Press, 1994.

The Collected Papers of Albert Einstein. Vol. 4, *The Swiss Years: Writings, 1912-1914. English Translation*. Consultant. Anna Beck, trans. Princeton: Princeton University Press, 1996.

The Collected Papers of Albert Einstein. Vol. 5, *The Swiss Years: Correspondence, 1902-1914. English Translation*. Consultant. Anna Beck, trans. Princeton: Princeton University Press, 1995.

Vladimir Vizgin, “Einstein, Hilbert, and Weyl: The Genesis of the Geometrical Unified Field Theory Program.” In *Einstein and the History of General Relativity*. Proceedings of the 1986 Osgood Hill Conference, North Andover, Massachusetts, 8-11 May 1986. Ed. Don Howard and John Stachel. Boston: Birkhäuser, 1989, pp. 300-315. Translation of “Einstein, Hilbert, Weyl: Genesis des Programms der einheitlichen geometrischen Feldtheorien,” *NTM-Schriftenreihe für die Geschichte der Naturwissenschaften, Technik und Medizin* (Leipzig) 21 (1984), 23-33.

h. “Science Matters” Blog (<http://donhoward-blog.nd.edu/>)

“The Moral Imperative of a Permanent, Human Presence on the Moon, Mars, and Beyond.” Posted 10 July 2019.

“Apocalyptomania – Why We Should Not Fear an AI Apocalypse.” Posted 26 July 2017.

“On the Pseudoproblem of Interdisciplinarity.” Posted 22 Feb 2016.

“The Liberal, Environmentalist Argument for the Keystone Pipeline.” Posted 13 November 2014.

“On the Moral and Intellectual Bankruptcy of Risk Analysis: Garbage In, Garbage Out.” Posted 28 September 2014.

“The Scientist qua Scientist Has a Duty to Advocate and Act.” Posted 24 March 2014.

“Nuclear Options: What Is Not in the Interim Agreement with Iran.” Posted 28 November 2013.

“Robots on the Road: The Moral Imperative of the Driverless Car.” Posted 7 November 2013.

“I Sing the Body Electric.” Posted 6 November 2013.

“Science in the Crosshairs.” Posted 8 October 2013.

“How to Talk about Science to the Public – 2. Speak Honestly about Uncertainty.” Posted 11 March 2012.

“Science and Values – 1. The Challenge for the Philosopher.” Posted 1 March 2012.

“Physics as Theodicy.” Posted 29 February 2012.

“How to Talk about Science to the Public – 1. Don’t Insult the Intelligence of Your Audience.” Posted 29 February 2012.

“Where’s the Intelligence in Intelligent Design?” Posted 29 February 2012.

“Physics and Humility.” Posted 28 February 2012.

i. Other Published Works

“AI vs The Bomb.” *AI and Faith Newsletter*, June 23, 2023. (<https://aiandfaith.org/ai-vs-the-bomb/>)

“Geleitwort.” In *Albert Einstein – Moritz Schlick. Briefwechsel*. Jürgen Renn and Olaf Engler, eds. Hamburg: Felix Meiner (2022).

“The Good News about Technology Ethics.” *AI and Faith Newsletter*, January 30, 2020. (<https://aiandfaith.org/the-good-news-about-technology-ethics/>)

“Robert S. Cohen (1923-2017).” Co-authored with Alisa Bokulich.) Boston University Center for History and Philosophy of Science, 2017, (<https://www.bu.edu/cphs/about/robert-cohen/>)

Ethical, Legal, and Societal Implications of New Weapons Technologies. (Co-authored with Maj. Gen. (Ret.) Robert Latiff.). Washington, DC: National Academies Press, 2015. This is a suite of training materials for in-service learning, based upon the DARPA-NRC report, *Emerging and Readily Available Technologies and National Security: A Framework for Addressing Ethical, Legal, and Societal Issues* (2014). Included are multiple power point presentations (8-hour, 4-hour, and 2-hour versions), a 34-page briefing book, and a 28-page bibliography. Published here: <http://reilly.nd.edu/research/initiatives/darpa-nrc/>

“Abner E. Shimony, 1928–2015.” A memorial note in the *Proceedings and Addresses of the American Philosophical Association*, 2015.

“The Apocalypse as a Rhetorical Device in the Influenza Virus Gain-of-Function Debate.” (Co-authored with Arturo Casadevall and Michael Imperiale.) *mBio: An Open Access Journal Published by the American Society for Microbiology* 5 (5) e01875-14. (<http://mbio.asm.org/content/5/5/e02062-14.full>)

“An Epistemological Perspective on the Value of Gain-of-Function Experiments Involving Pathogens with Pandemic Potential.” (Co-authored with Arturo Casadevall and Michael Imperiale.) *mBio: An Open Access Journal Published by the American Society for Microbiology* 5 (5) e01875-14. (<http://mbio.asm.org/content/5/5/e01875-14.full>)

“Punch the Accelerator on Self-Driving Cars: The technology exists to save millions of lives. So why are regulators hitting the brakes?” (Co-authored with Mark Mills.) *Wall Street Journal*, February 20, 2014.

“The Virtuous Robot.” *CRUSER News*. Naval Postgraduate School. January 2013, 2.

“Where’s the Intelligence in Intelligent Design?” *Reilly Center Reports* (2008). URL = <<http://reilly.nd.edu/assets/65753/rcrhoward.pdf>>

“James Thomas Cushing” (coauthored with William McGlenn). *Physics Today* 55 (October 2002), 70.

“Einstein, Albert (1879-1955).” In *World Book Encyclopedia*. (2002 edition.)

Articles on: Pierre Duhem, Max Planck, Eduard Le Roy, and Albert Einstein (the last coauthored with Arthur Fine and John Norton). In *Routledge Encyclopedia of Philosophy*, 1998.

“Albert Einstein, 1879-1955.” In *Read All About It: An Encyclopedia of Information on Historical Figures and Events*, vol. 3. Ann Arbor, Michigan: Pierian Press, 1989, pp. 183-185.

Articles on: Hugo Dingler, “Das physikalische Weltbild” (pp. 564-65); Albert Einstein, “Die Grundlage der allgemeinen Relativitätstheorie” (p. 314), “Physik und Realität” (p. 567); Max Planck, “Das Weltbild der neuen Physik” (p. 807); Henri Poincaré, “La Science et l’Hypothèse” (p. 628), “La Valeur de la Science” (pp. 761-62). In *Lexikon der philosophischen Werke*. Julian Nida-Rümelin and Franco Volpi, eds. Stuttgart: Alfred Kröner Verlag, 1988.

MEDIA RELATIONS

“Einstein und sein letzter Sommer in Caputh.”

(https://youtu.be/c_5KFC0MCpo?si=Uc1brJ13eIppoCf7)

Exile: Leo Baeck Institute Podcast Series, December 21, 2023.

“In Defense of (Virtuous) Autonomous Weapons.”

(<https://dda.ndus.edu/2023-02-22-don-howard/>)

Dakota Digital Discussions, February 22, 2023.

“Technology and Ethics.”

(<https://soundcloud.com/voislam/drivetime-show-podcast-06-06-2023-child-safety-and-technology>)

Drive Time. Voice of Islam, June 6, 2023.

“Summer in Caputh.”

(<https://podcasts.apple.com/ca/podcast/episode-3-summer-in-caputh/id1650847873?i=1000586256966>)

Exile: Leo Baeck Institute Podcast Series, November 15, 2022.

“Einstein.”

(<https://podcasts.apple.com/ca/podcast/episode-39-einstein/id1565762770?i=1000549746160>)

Since the World’s Been Turning Podcast, February 2, 2022.

“Pressing Issues of the Future.”

(<https://www.ksmu.org/show/stem-spots/2022-01-24/stem-spots-pressing-issues-of-the-future>)

STEM Spots Podcast, January 24, 2022.

“Scientists as Activists, Human Rights, and Ethics with Don Howard.”

(<https://mynuclearlife.com/episode/scientists-as-activists-human-rights-and-ethics-with-don-howard>)
My Nuclear Life Podcast, September 15, 2021.

“Quantum Interest: Notre Dame Restores Forgotten Letters of Scholars’ Physics Debates”
(<https://www.nd.edu/stories/quantum-interest/>)
Notre Dame Stories, February 3, 2020

“From Einstein’s Philosophy to the Ethics of High Technology: A Conversation With Don Howard.”
(<https://athenaeumreview.org/podcast/from-einsteins-philosophy-to-the-ethics-of-high-technology-a-conversation-with-don-howard/>)
Anthenaem Review Podcast, March 7, 2019.

“Whether Robots Deserve Human Rights Isn't the Correct Question. Whether Humans Really Have Them Is..”
(<https://www.nbcnews.com/think/opinion/don-howard-robot-rights-ncna864621>)
NBC Think, April 11, 2018.

“When Being a Scientist is Politically Dangerous.”
(<http://www.abc.net.au/radionational/programs/sciencefriction/when-being-a-scientist-is-politically-dangerous/8467406>)
Science Friction, Australian National Broadcasting Corporation, April 29, 2017

“The Robot Scabs Are Coming to Take Your Jobs.”
(<http://www.cnn.com/2017/04/15/opinions/the-robot-scabs-are-coming-to-take-your-jobs-howard-opinion/>)
CNN, April 15, 2017

“The Robotic Moral Code – Programming Ethics into Machines”
(<http://sparkdialog.com/robotic-moral-code/>)
Spark Dialog with Elizabeth Fernandez, February 14, 2017

“Can Machines Become Moral”
(<https://www.bigquestionsonline.com/2016/10/23/can-machines-become-moral/>)
Big Questions Online, October 23, 2016

“Don Howard on Robot Ethics.” (<http://srpoise.org/news/don-howard-on-robot-ethics/>)
An Interview with Dave Saldana.
SRPOiSE: The Consortium for Socially Relevant Philosophy of/in Science.

“Ethics-DARPA Hard” (<http://www.insidesources.com/ethics-darpa-hard/>)
Don Howard
InsideSources, May 7, 2014

“Robot 'Code of Ethics' Could Move From Sci-Fi to Real Life” (<http://www.nbcnews.com/tech/innovation/robot-code-ethics-could-move-sci-fi-real-life-n83201>)
Nidhi Subbaraman
NBC News, April 28, 2014

“Ahead of the Curve: Anticipating Ethical, Legal, and Societal Issues Posed by Emerging Weapons Technologies” (<http://www.wnit.org/expmichiana/e/april-14th-2014.html#segment=4>)

Inside Michiana

WNIT Public Television, April 13, 2014

“Punch the Accelerator on Self-Driving Cars: The technology exists to save millions of lives. So why are regulators hitting the brakes?” (<http://online.wsj.com/news/articles/SB10001424052702304428004579354520148991170>)

Don Howard and Mark Mills

Wall Street Journal, February 20, 2014

“Albert Einstein” (http://newstalk.ie/reader/47.305.379/849/blog_list/)

Talking History

Newstalk.ie, Dublin, 106-108 fm, May 20, 2013

“Challenging Einstein Usually a Losing Venture” (<http://usatoday30.usatoday.com/tech/science/story/2011-09-22/particle-travels-faster-than-speed-of-light/50518790/1>)

Seth Borenstein

USA Today, September 23, 2011

“Brilliant Minds: Secrets of the Cosmos.”

Science **Channel**, 2003.

ADDRESSES, LECTURES, AND TALKS

a. Lecture Series

“Albert Einstein: Physicist, Philosopher, Humanitarian.” **The Teaching Company**. Chantilly, VA, 2008.

b. Academic and Professional Lectures and Talks

2022-2023 Academic Year:

“The Copenhagen Interpretation.” Invited Lecture, Niels Bohr Institute, **Copenhagen, Denmark**, 13 September, 2023. (Trip cancelled owing to illness.)

“Quine, Dewey, and the Pragmatist Tradition.” Invited keynote lecture at the conference, “Values, Pluralism, and Pragmatism: A Celebration of Matthew J. Brown’s Contributions to the CVMST,” Center for Values in Medicine, Science, and Technology (CVMST), **University of Texas at Dallas**, 24 May 2023.

“Complementarity and Decoherence.” Invited lecture at the conference, “Frontiers in Foundations of Physics: A Philosophical Inquiry,” **Sharif University of Technology**. Tehran, Iran, 19 May 2023.

2021-2022 Academic Year:

“Realism in the Bohr-Einstein Debate.” Invited lecture at the online conference on “Quantum Theory and Reality,” Eighth Edition of the **International Workshop on Quantum Mechanics and Quantum Information**, April 27-28, May 3-4, 2022.

“Expertise and Responsibility: Why the Possession of Specialist Knowledge Entails an Obligation to Moral and Political Action.” Invited keynote address to the **Sigma Xi Annual Meeting**, “Roots to Fruits: Responsible Research for a Flourishing Humanity – How Scientific Virtues Serve Society,” 5 November 2021.

2020-2021 Academic Year:

“Nuclear Technology: A Moral Imperative.” Invited lecture in the ND Energy Distinguished Lectures series, **University of Notre Dame**, 17 February 2021.

“Expertise and Responsibility: Why the Possession of Specialist Knowledge Entails an Obligation to Moral and Political Action.” Invited presentation and discussion, Socially Engaged Philosophy of Science Works-in-Progress workshop, **Michigan State University**, 6 November 2020.

2019-2020 Academic Year:

“The Philosopher Physicists: Albert Einstein and Philipp Frank.” Invited lecture to have been given to the Einstein Papers Project, **California Institute of Technology**, 10 March 2020.

“Complementarity and Decoherence.” Invited lecture given to the Department of Physics at the **Universidad de los Andes**, Bogota, Colombia, 21 February 2020.

“Expertise and Responsibility: Why the Possession of Specialist Knowledge Entails an Obligation to Moral and Political Action.” Invited keynote lecture given at the conference, “From Industry 4.0 to an Inclusive Society 4.0?”, sponsored by the School of Engineering at the **Universidad de los Andes**, Bogota, Colombia, 20 February 2020.

“Big Data, AI, and Civic Virtue.” Invited lecture to be given at the Beijing Forum “Humanity and Legal Governance in the Digital Era,” **Peking University**, 2 November 2019.

“Big Data, AI, and Civic Virtue.” Invited lecture given at the 2019 Virginia Tech Philosophy Graduate Conference Schedule, **Virginia Tech**, Blacksburg, Virginia, 5 October 2019.

2018-2019 Academic Year:

“Big Data, AI, and Civic Virtue.” Invited Lecture to be given at the conference, “Media Ethics. Human Ecology in a Connected World,” **University of Toronto**, 29 June 2019.

“What Is Complementarity?” Invited lecture to have been given at the conference, “Quantum Limits of Knowledge,” Niels Bohr Institute, **Copenhagen, Denmark**, 19-21 June, 2019.

“Philosophy When Desirable.” Invited talk delivered at the conference, “Looking Back as We Move Forward: The Past, Present, and Future of the History of Science. A Conference in Honor of Jed Z. Buchwald.” **California Institute of Technology**, Pasadena, California, 27 April 2019.

“Big Data, AI, and Civic Virtue.” Invited lecture delivered as part of the lecture series on “AI, Big Data and the Algorithmic Society,” **University of Texas at Dallas**, 6 March 2019.

“Big Data, AI, and Civic Virtue.” Invited lecture given as part of the lecture series on “Ethics in the Information Age,” **Indiana University, Bloomington**, 28 February 2019.

“A Philosopher’s Field Guide to Talking with Engineers.” Invited talk given as part of the panel on “Opportunities for Public Philosophers: Science and Technology Policy,” American Philosophical Association Central Division Meeting, **Denver, Colorado**, 23 February 2019.

“Big Data, AI, and Civic Virtue.” Invited lecture delivered to the Adam Smith Society, Mendoza College of Business, **University of Notre Dame**, 12 February 2019.

“Why Do We Need Space?” Invited lecture delivered at the conference on “The Origins and Evolution of Space-Time,” **Pontifical Lateran University, Rome**, 27 November 2018.

“Einstein the Theologian.” Invited lecture delivered at the workshop on “How Theories are Born between Science, Philosophy and Theology,” **Pontifical Lateran University, Rome**, 26 November 2018.

“How General Relativity Shaped Twentieth-Century Philosophy of Science.” Invited keynote lecture delivered at the First Biennial Midwest Summer School in Philosophy of Physics, **University of Chicago**, 25 August 2018.

“Quine, Dewey, and the Pragmatist Tradition in American Philosophy of Science.” Lecture given as part of a symposium on “Pragmatism in the Philosophy of Science,” at HOPOS 2018: The Twelfth International Conference of the International Society for the History of Philosophy of Science in **Groningen, the Netherlands**, 9-12 July 2018.

2017-2018 Academic Year:

“Concepts of Completeness in Einstein’s Critique of Quantum Mechanics.” Invited talk given at the workshop on “The Formal Semantics of Theories: Conceptual and Historical Foundations,” **University of Salzburg**, 7-8 June 2018.

“Complementarity and Decoherence.” Invited lecture given at the Munich Center for Mathematical Philosophy, **University of Munich**, 6 June 2018.

“Citizen Scientists as Agents of Change: A Virtue Ethics Approach to Research Ethics Training.” Invited lecture given at the conference on “Science, Technology, and the Good Life,” **University of Notre Dame**, 7 April 2018.

“Ernst Mach’s Vienna: The Place of History and Philosophy in Science.” Invited lecture given as the inaugural Erik Banks Memorial Lecture, **Wright State University**, Dayton, Ohio, 22 March 2018.

“Complementarity and Decoherence.” Invited lecture given at the Niels Bohr Institute, **Copenhagen, Denmark**, 12 March 2018.

“Virtue Ethics and Technology-Enhanced Warfare.” Invited Lecture at the conference, “Technology-Enhanced Warfare: Perspectives from Ethics and Social Science,” Notre Dame Global Gateway Center, **Rome, Italy**, 17 October 2017.

“Back to the Future: Ernst Mach and Integrated History and Philosophy of Science for the Twenty-first Century.” The Alberto Coffa Memorial Lecture, **Indiana University-Bloomington**, 5 October 2017.

2016-2017 Academic Year:

“Physics and Human Rights – Then and Now.” Invited lecture given at the semi-annual Statistical Mechanics Conference, **Rutgers University**, New Brunswick, NJ, 8 May 2017.

“Technomoral Civic Virtues: A Critical Appreciation of Shannon Vallor’s *Technology and the Virtues*.” Invited panel presentation, Central Division Meeting of the American Philosophical Association, **Kansas City, MO**, 2 March 2017.

“Einstein on Simplicity in Theory Choice.” Invited lecture given to the Department of Philosophy, **Johns Hopkins University**, Baltimore, MD, 9 February 2017.

“Civic Virtue and Cybersecurity.” Invited panel presentation at the Computer Privacy and Data Protection 2017 conference, **Brussels, Belgium**, 26 January 2017.

“Civic Virtue and Cybersecurity.” Invited lecture given at the conference, “Developing a Normative Framework for Cyberwarfare,” at the **US Naval Academy**, Annapolis, MD, 17-18 October 2016.

2015-2016 Academic Year:

“The Virtuous Robot.” Invited lecture given at the **Air Force Research Laboratory, Rome, NY**, 6 June 2016.

“Back to the Future: Ernst Mach and Integrated History and Philosophy of Science for the Twenty-first Century.” Invited keynote lecture given at the conference, “Ernst Mach (1838-1916): Life, Work, and Influence,” at the **University of Vienna** and the **Austrian Academy of Sciences**, 16-18 June 2016.

“In Defense of (Virtuous) Autonomous Weapons.” Invited talk given at the Inaugural Human Rights Center IHL/LOAC Conference on “Autonomous Weapons Systems” at the **University of Minnesota Law School**, Minneapolis, 4 April 2016.

“How General Relativity Shaped Twentieth-Century Philosophy of Science.” Invited talk given at the conference, “General Relativity at One Hundred.” **California Institute of Technology**, 10-12 March 2016.

“Taking Responsibility for Problem-Solving Opportunities: Towards a Positive Engineering Ethics.” Invited lecture given in connection with the conference, “Nuclear Condition(s) - Technology, Politics, Philosophy,” **Technical University of Darmstadt**, Darmstadt, Germany, 11 February 2016.

“The Artificial Autonomous Moral Agent (AAMA): A Minimalist Model.” (Co-authored with Ioan Muntean.) Talk given at the AAAI 2016 Spring Symposium on Ethical and Moral Considerations in Nonhuman Agents, **Stanford University**, 21-23 March 2016. (Talk given by my collaborator, Ioan Muntean.)

“In Defense of (Virtuous) Autonomous Weapons.” Invited lecture given to the Department of Philosophy, **Purdue University**, 15 December 2015.

“In Defense of (Virtuous) Autonomous Weapons.” Invited lecture given at the conference on “The Transformation of War through Information Technology and Its Impact on the Ethics and Law of Armed Conflicts.” Centre for Ethics, **University of Zurich**, Zurich, Switzerland, 6-7 November 2015.

“Robot Ethics.” Invited Lecture given as The College of Arts and Sciences 2015 Distinguished Lecture, **Indiana University – Purdue University, Fort Wayne**, 23 October 2015.

“Robot Ethics.” Invited Lecture given as the opening keynote lecture for Digital Week, **University of Notre Dame**, 22 September 2015.

2014-2015 Academic Year:

“Virtue in Machine Ethics: An Approach Based on Neural Nets and Evolutionary Computation.” (With Ioan Muntean.) Lecture delivered at the joint meeting of the International Association for Computing and Philosophy and the Computer Ethics: Professional Enquiry group, **University of Delaware**, 22-25 June 2015.

“Einstein and the Development of 20th Century Philosophy of Science.” Invited lecture at the conference, “100th Anniversary of General Relativity,” Center for Philosophy and History of Science, **Boston University**, 27 March 2015.

“Einstein as a Philosopher of Science.” Invited departmental colloquium talk, Department of Philosophy, **St. Louis University**, 27 February 2015.

“Virtue in Machine Ethics: An Approach Based on Evolutionary Computation.” (Co-authored with Ioan Muntean). Paper presented at the annual meeting of the Central Division of the American Philosophical Association, **St. Louis, Missouri**, 18-21 February 2015.

“Robot Ethics.” Invited presentation as part of the panel on SRPo/iSE: Socially Responsible Philosophy of/in Science and Engineering at the annual meeting of the Eastern Division of the American Philosophical Association, **Philadelphia, Pennsylvania**, 27-30 December 2014.

“Virtue in Cyberconflict.” Invited lecture for the workshop, “Technology-mediated Tragic Decisions in Military, Cybersecurity, and Humanitarian Crises.” Centre for Ethics, **University of Zurich**, Zurich, Switzerland, 21-22 October 2014.

“Back to the Future: Whence and Whither HPS.” Lecture delivered at the conference celebrating the 25th anniversary of the Notre Dame History and Philosophy of Science Graduate Program, **University of Notre Dame**, 26-28 September 2014.

2013-2014 Academic Year:

“Robot Ethics.” Invited lecture to the Joint Contest-Olimpia-Eager School on “System Integration,” Fraunhofer EMFT Institute, **Munich, Germany**, 26-28 May 2014.

“A Code of Ethics for the Human-Robot Interaction Profession.” (Co-authored with Laurel Riek.) Paper presented to the conference, “We Robot 2014,” **University of Miami**, 4-5 April 2014.

“Einstein the Philosopher.” Invited lecture in the Series, “Lectures on Quantum Phenomena,” Pacific Institute for Theoretical Physics, **University of British Columbia**, 5 March 2014.

“Albert Einstein: Philosopher-Scientist.” Invited talk at the conference “An Intellectual Life across Disciplines: Colloquium in Honour of John Stachel’s 85th Birthday,” at the **Max Planck Institute for the History of Science**, Berlin, Germany, 12-13 September 2013.

“A Cyber Pugwash Movement.” Invited keynote lecture at the conference, “Ethics of Cybersecurity,” **Australian National University**, Canberra, Australia, 5-6 August 2013.

2012-2013 Academic Year:

“What Is Complementarity?” Invited talk given at the Erhard Scheibe Memorial Conference, **Technical University of Dortmund**, 15 June 2013.

“Einstein als Wissenschaftstheoretiker.” Invited keynote address given at the workshop on “Einstein’s Philosophy of Science,” Institute of Philosophy, **Bucharest University**, 25 May 2013.

“Decoherence and Complementarity.” Invited keynote address given at the Bucharest Colloquium in Analytic Philosophy conference on “New Directions in Physics,” Institute for Philosophy, **Bucharest University**, 24 May 2013.

“What Is Complementarity?” Invited talk given at the session on the “100th Anniversary of the Bohr Atom,” at the American Physical Society April Meeting, **Denver, Colorado**, 16 April 2013.

“Einstein and the Vienna Circle.” Invited lecture, given as the 20th Annual Vienna Circle Lecture, Institute Vienna Circle, **University of Vienna**, 13 December 2012.

“Einstein on Principle and Constructive Theories.” Invited lecture, Institute of Philosophy, **Hungarian Academy of Sciences**, Budapest, Hungary, 11 December 2012.

“Einstein and the Vienna Circle.” Invited lecture, Institute of Philosophy, **Hungarian Academy of Sciences**, Budapest, Hungary, 10 December 2012.

“Civic Virtue and Cybersecurity.” Invited lecture given at the conference on “Online Security and Civil Rights,” **University of Hertfordshire**, Hatfield, England, 26-27 October 2012.

“*Mehrdeutigkeit* and Meaning in Physical Theory: An Historical-Critical Appreciation of Laura Ruetsche’s *Interpreting Quantum Theories*.” Talk given at the symposium, “Quantum and Geometric Possibility: A book Symposium Celebrating Recent Books by Gordon Belot and Laura Ruetsche,” **University of Western Ontario**, London, Ontario, 15 September 2012.

2011-2012 Academic Year:

“Philosophy of Science in Science Policy.” Invited talk given at the conference on “The Social Relevance of Philosophy of Science,” Zentrum für interdisziplinäre Forschung, **Universität Bielefeld**, 11-13 June 2012.

“Quine, Dewey, and the Pragmatist Tradition in American Philosophy of Science.” Invited talk given at the conference on “Pragmatism in Philosophy of Science,” **University of San Francisco**, 30-31 March 2012.

“Concepts of Completeness in Einstein’s Critique of Quantum Mechanics.” Invited talk given to the Einstein Papers Project, **Caltech**, Pasadena, California, 8 March 2012.

“The Trouble with Metaphysics.” Invited keynote lecture at PhiloSTEM: The Midwest Workshop on Philosophy of Science, Technology, Engineering, and Mathematics, **Indiana University-Purdue University-Fort Wayne**, 11 November 2011.

2010-2011 Academic Year:

“Commencement Address.” Invited commencement address on the occasion of the 40th anniversary of the first graduating class (of which I was a member) of **Lyman Briggs College, Michigan State University**, East Lansing, Michigan, 7 May 2011.

“Cyberwarfare and Its Challenges to the Laws of Armed Conflict.” Talk given as part of a symposium on “Ethics on the Edge: Emerging Military Technologies and the Just War Tradition,” at ISME 2011, the annual meeting of the **International Society for Military Ethics**, San Diego, 26 January 2011.

“Einstein as a Philosopher of Science.” Invited lecture given as part of the Distinguished Lecture Series, Department of Philosophy, **Virginia Tech**, 3 December 2010.

“Unitarily Inequivalent Representations of AQFT, Non-categoricity, and Ontic Structural Realism.” Invited talk given at the workshop on “Structuralism,” **University of Notre Dame**, 20 November 2010.

“The Genius of Albert Einstein: His Science and Life.” Invited lecture at **One Day University**, New York, 3 October 2010.

“Quantum Mechanics in Context: Pascual Jordan’s 1936 Anschauliche Quantentheorie.” Lecture given at HQ3, the Third International Conference on the History and Foundations of Quantum Physics at the **Max Planck Institute for the History of Science**, Berlin, Germany, 2 July 2010.

“Boltzmann Edits Maxwell: The German-language Reception of the “Model” Concept from British Electrodynamics.” Lecture given at HOPOS 2010, the Eighth International Conference of the International Society for the History of Philosophy of Science at the **Central European University** in Budapest, Hungary, 26 June 2010.

2009-2010 Academic Year:

“Facts, Values, and the Social Organization of Science.” Invited talk given at the workshop on “Science, Facts, and Values,” **University of Western Ontario**, 14-16 May 2010.

“The Trouble with Metaphysics.” Invited lecture given as part of the conference on “Philosophy and History of Science: Then and Now,” Boston Colloquium for Philosophy of Science, **Boston, Massachusetts**, 15 April 2010. This is the Jubilee Celebration of the 50th Anniversary of the Boston University Center for Philosophy of Science.

“Black Holes, Gravitational Lensing, and the Expanding Universe: Einstein on Relativistic Cosmology.” Invited talk given to the **Michiana Astronomical Society**, Mishawaka, IN, 15 March 2010.

“Pauli’s 1933 *Die allgemeinen Prinzipien der Wellenmechanik*.” Invited talk given as part of the symposium on “A History of Quantum Physics through the Textbooks,” History of Science Society Annual Meeting, **Phoenix, Arizona**, 21 November 2009.

“‘But this is wondrous strange!’ Constructing an Agenda for the Philosophy of Astronomy.” Invited talk given at the Ninth Biennial History of Astronomy Workshop, **University of Notre Dame**, 8-12 July 2009.

2008-2009 Academic Year:

“Dewey as a Philosopher of Science.” Invited talk given at the conference on “Pragmatism & Science,” Center for Inquiry Transnational, **Amherst, New York**, 19-20 June 2009.

“Transient Underdetermination and the Place of the Political in Science.” Invited talk given at the conference on “Science and Values: The Politicisation of Science.” Center for Interdisciplinary Research (ZiF), **Bielefeld, Germany**, 25-30 May 2009.

“Science and the Human Good.” An invited lecture, the Arthur J. Schmitt Lecture, delivered under the auspices of the Center for Ethics and Culture, **University of Notre Dame**, 21 April 2009.

“Are Elementary Particles Individuals? A Critical Appreciation of Steven French and Décio Krause’s *Identity in Physics: A Historical, Philosophical, and Formal Analysis*.” Invited lecture delivered as part of an authors-meet-critics session on Stephen French and Decio Krause, *Identity in Physics: A Historical, Philosophical, and Formal Analysis* (Oxford: Clarendon, 2006), at the annual meeting of the Pacific Division of the American Philosophical Association, **Vancouver, Canada**, 8-12 April 2009.

“Albert Einstein: Physicist, Philosopher, and Humanitarian.” Invited lecture given at **Youngstown State University**, 25 March 2009.

“Progressivism, Pragmatism, and Science: John Dewey’s Theory of Science.” Talk presented as part of a symposium on “Pragmatism at the Interface of Science and Politics” at the Twenty-first Biennial Meeting of the Philosophy of Science Association, **Pittsburgh, Pennsylvania**, 6 November 2008.

“Entanglement, Complementarity, and Decoherence: Bohr on the Classical and the Macroscopic.” Invited talk given at a session on “History and Philosophy of Physics,” at the 75th annual meeting of SESAPS, the **Southeastern Section of the American Physical Society**, Raleigh, North Carolina, 29 October - 1 November, 2008.

“Einstein the Philosopher.” An invited lecture, the Sawyer Philosophy Lecture in Science, Technology, and Society, **Illinois Institute of Technology**, Chicago, 24 October 2008.

“Entanglement, Complementarity, and Decoherence: Bohr on the Classical and the Macroscopic.” Invited talk given at a workshop on “Classical Concepts and Metaphysical Presuppositions in Quantum Physics,” Carmen de la Victoria, **Grenada, Spain**, 9-10 October 2008.

2007-2008 Academic Year:

“A Proto-Bell Experimental Program? Walther Bothe’s Quantum Correlations Experiments of the Mid-1920s.” Talk to have been given at the conference, HQ2 - History of Quantum Physics, **Utrecht, The Netherlands**, 14-17 July 2008. (Trip cancelled because of overwork.)

“Progress and Understanding in Space-Time Theories: Deploying Einstein’s ‘Principle Theories/ Constructive Theories’ Distinction.” Invited talk delivered at the symposium on “Time and Relativity,” **University of Minnesota**, 25-27 October 2007.

“Knowing ‘where the shoe pinches’: Einstein on the Role of History and Philosophy of Science in Physics.” Invited lecture given to a joint colloquium of the Department of Philosophy and Religion and the Department of History, **University of Mississippi**, 12 September 2007.

“The Early History of Quantum Entanglement: 1905-1935.” Invited lecture given at the conference “Time and Matter (TAM 2007),” **Bled, Slovenia**, 26-31 August 2007.

“EPR and the Hole Argument: In What Sense Did Einstein Think Quantum Mechanics Incomplete?” Talk delivered at the conference “History and Foundations of Quantum Physics,” Max Planck Institute for the History of Science, **Berlin, Germany**, 2-6 July 2007.

2006-2007 Academic Year:

Invited lecture to have been delivered at the conference on “The Cultural Alchemy of the Exact Sciences: Revisiting the Forman Thesis,” **University of British Columbia**, Vancouver, Canada, March 2007. (Trip cancelled because of overwork.)

“The Metaphysics of Entanglement and the Entanglement of Metaphysics.” Invited lecture at the STARS (Science and Transcendence Advanced Research Series) conference, “Cosmology, Physics, and the Possibility of Life,” **Cancun, Mexico**, January 4-8, 2007.

2005-2006 Academic Year:

“Einstein’s Debt to Hilbert.” Invited lecture given as part of a symposium on “The Legacy of Hilbert: The Sixth Problem,” at the Sixth International Conference on the History of the Philosophy of Science, **École Normale Supérieure, Paris**, June 14-18, 2006.

“Einstein as a Philosopher of Science.” Invited lecture given to the Department of Physics, **Washington University**, St. Louis, Missouri, 26 April 2006.

“Einstein as a Philosopher of Science” and “Einstein’s Path to His ‘Miracle Year’ 1879-1905.” Two invited lectures, the first given to the Departments of Physics and Philosophy and the second as a public address at **Northern Arizona University**, April 3-4, 2006.

“The Early History of Quantum Entanglement: 1905-1935.” Invited lecture given at the conference on “Quantum Information and Entanglement,” part of the Boston Colloquium for the Philosophy of Science, **Boston University**, 24-25 March 2006.

“‘Coat Please . . .’ Einstein on the Relation between Theory and Experience.” Invited lecture given as part of the session, “Centennial of Einstein's Theory of Relativity,” at the 102nd Annual Meeting of the **Eastern Division of the American Philosophical Association**, New York, 27-30 December, 2005.

“Revisiting the Einstein-Bohr Dialogue.” Invited lecture delivered in the Bar-Hillel Colloquium for the History, Philosophy, and Sociology of Science, Van Leer Jerusalem Institute, **Jerusalem, Israel**, 7 December 2005.

“Living with the Bomb during the Cold War, or How I Learned to Start Worrying and Hate the Bomb.” Invited lecture delivered as part of the series, “Thoughts on the Unthinkable: Perspectives on Nuclear Weapons and Warfare,” Department of Physics, **University of Notre Dame**, 8 November 2005.

“Revisiting the Einstein-Bohr Dialogue.” Invited lecture delivered at the conference in memory of Mara Beller, **California Institute of Technology**, 28-30 October 2005.

“Physics as Theodicy” Invited lecture delivered at the CTNS/Vatican Observatory conference on “Scientific Perspectives on the Problem of Evil,” Castel Gandolfo, **Rome, Italy**, 12-16 September 2005.

“Einstein as a Philosopher of Science.” Invited lecture delivered at the forum, “Einstein in Cross-Cultural Perspectives: Celebrating the Centennial Anniversary of Einstein’s Miraculous Year,” Tsinghua University, **Beijing, China**, 25 July 2005.

2004-2005 Academic Year:

“Reduction, Supervenience, and Emergence: Philosophical Perspectives on the Relationship between Particle Physics and Condensed Matter Physics.” Invited talk delivered at the Ninth Annual Seven Pines Symposium, “The Classical-Quantum Borderlands.” **Stillwater, Minnesota**, 4-8 May 2005.

“Einstein’s Path to His ‘Miracle Year’ 1879-1905.” Invited lecture given to participants in the National Science Bowl competition, **Washington, DC**, 30 April 2005.

“‘No Crude Surfeit’: A Critical Appreciation of *The Reign of Relativity*.” Invited lecture delivered at the annual meeting of the Pacific Division of the American Philosophical Association, **San Francisco, California**, 26 March 2005.

“Einstein as a Philosopher of Science.” Invited lecture delivered at the annual meeting of the Deutsche Physikalische Gesellschaft, **Berlin, Germany**, 7 March 2005.

“‘And I Shall Not Mingle Conjectures with Certainties’: Einstein on the Principle Theories—Constructive Theories Distinction.” Invited lecture delivered at the conference, “2005: The Centenary of Einstein’s Annus Mirabilis 1905,” British Academy, **London, England**, 4-5 March 2005.

“Einstein as a Philosopher of Science.” Invited lecture delivered to the annual meeting of the American Association for the Advancement of Science, **Washington, DC**, 20 February 2005.

“Einstein as a Philosopher of Science.” Invited lecture inaugurating the “World Year of Physics” series, Department of Physics, **University of Notre Dame**, 4 January 2005.

“Entanglement Big and Small: On the Relation between Condensed Matter Physics and Particle Physics” and “Social Normativity and the Epistemology of Science: Philosophy of Science in the Public Domain.” Talks given at Nineteenth Biennial Meeting of the Philosophy of Science Association, **Austin, Texas**, 18-20 November 2004.

“‘Let me briefly indicate why I do not find this standpoint natural.’ Einstein, General Relativity, and the Contingent A Priori.” Invited lecture delivered at the conference, “Synthesis and the Growth of Knowledge: Examining Michael Friedman’s Approach to the History of Philosophy and Science,” **University of South Carolina**, 1-3 October 2004.

“Quest and Consequences: Reflections on Oppenheimer and the Atomic Bomb.” Invited talk as part of panel discussion in conjunction with staging of Carson Kreitzer’s “The Love Song of J. Robert Oppenheimer,” **University of South Carolina**, 30 September 2004.

“Frank and Einstein.” Invited lecture delivered at the symposium on “Philipp Frank: Wien – Prag – Boston,” **Universität Wien**, 27-28 September 2004.

2003-2004 Academic Year:

“Schlick, Einstein, and the Role of Convention in Spacetime Physics” and “Scientific Objectivity as ‘Socially-Organized Experience’: Early Marxist Debates about the Social Character of Scientific Knowledge.” Invited lectures at the Fifth International Conference on the History of the Philosophy of Science, **San Francisco**, 23–27 June 2004.

“Who Invented the Copenhagen Interpretation? A Study in Mythology.” Invited talk delivered at the Eighth Annual Seven Pines Symposium, “Quantum Mechanics, Quantum Information, and Quantum Computation.” **Stillwater, Minnesota**, 5-9 May 2004.

“Conventionalism in Spacetime Theories”; “The Hole Argument in General Relativity”; and “Covariance and Relativity.” Invited lectures at the **Bonn-Cologne “Philosophy of Physics” Spring School**, Wermelskirchen, Germany, 28 March-4 April, 2004.

“Spin, Space, Symmetries, and Statistics: Some Questions about Covariance, Nonseparability, and Particle Identity in the 1920s.” Invited talk delivered at the conference on Spacetime, **Oxford University**, 23-27 March 2004.

“The Elimination of Metaphysics through Dialectical Analysis of Science: Marxism in the Background of Logical Empiricism.” Invited talk delivered to the Department of Philosophy, **University of British Columbia**, Vancouver, Canada, 11 December 2003.

“Who Invented the Copenhagen Interpretation? A Study in Mythology.” Invited lecture delivered in the series, Green College Lectures on Quantum Phenomena, **University of British Columbia**, Vancouver, Canada, 10 December 2003.

“Reduction and Emergence in the Physical Sciences: Some Lessons from the Particle Physics–Condensed Matter Physics Debate.” Invited paper delivered at the conference on Reductionism and Emergence: Implications for the Science/Theology Dialogue, **University of San Francisco**, 7-11 October 2003.

“Political Engagement and Disengagement in the Philosophy of Science: A Few Chapters of History.” Invited talk delivered to the Department of Philosophy, **University of San Francisco**, 7 October 2003.

“The Elimination of Metaphysics through Dialectical Analysis of Science: Marxism in the Background of Logical Empiricism.” Invited paper delivered at the Notre-Dame - Bielefeld Interdisciplinary Conference on Science and Values, Zentrum für interdisziplinäre Forschung, **Universität Bielefeld**, 9-12 July 2003.

2002-2003 Academic Year:

“Who Invented the Copenhagen Interpretation? A Study in Mythology.” Invited talk delivered at the Conference in Honor of James T. Cushing, **Oxford University**, 26 June 2003.

“Physik, Philosophie und Freundschaft: Über die Beziehung zwischen Moritz Schlick und Albert Einstein”; “Koinzidenz und Konvention: Schlick, Einstein und die philosophische Bedeutung der Relativitätstheorie”; and “Vom Apriori zur Zuordnungsdefinition und zum Theorienholismus: Schlick und Einstein über den empirischen Inhalt physikalischer Theorien.” Invited lectures given as the Moritz Schlick Vorlesungen, **Universität Rostock**, 23-24 June 2003.

“From the Pre-Socratics to Newton: Early Views on the Vacuum.” Invited talk delivered at the Seventh Annual Seven Pines Symposium, “The Concept of the Vacuum in Physics,” **Stillwater, Minnesota**, 7-11 May 2003.

“Politics and the Philosophy of Science in the Nineteenth Century: Suggestions for an Agenda.” Invited paper to have been delivered in the Bar-Hillel Colloquium for the History, Philosophy, and Sociology of Science, at the Cohn Institute for History and Philosophy of Science, **Tel Aviv, University**, 10 March 2002. [Talk cancelled for security reasons.]

“Who Invented the Copenhagen Interpretation? A Study in Mythology.” Invited talk delivered at the Eighteenth Biennial Meeting of the Philosophy of Science Association, **Milwaukee, Wisconsin**, 7-10 November 2002.

“Another Voice in the Quantum Dialogue: Einstein’s Contribution to the Interpretation Debate.” Invited talk to have been delivered at the Eighteenth Biennial Meeting of the Philosophy of Science Association, **Milwaukee, Wisconsin**, 7-10 November 2002. [Talk cancelled due to illness of another participant in the session.]

“The Political History and Political Future of Philosophy of Science.” Talk delivered at the History of Science Society Annual Meeting, **Milwaukee, Wisconsin**, 7-10 November 2002.

“The Philosopher’s View of Time.” Invited talk delivered at the conference Time and Matter: An International Colloquium on the Science of Time, **Venice, Italy**, 11-17 August 2002. [Talk cancelled for health reasons.]

2001-2002 Academic Year:

“Einstein, Friedman, and Kant: Are There Contingent A Priori Elements in the General Theory of Relativity?” Talk delivered at the Sixth International Conference on the History of General Relativity, **University of Amsterdam**, 26-29 June 2002. [Talk cancelled for health reasons.]

“Politics and the Philosophy of Science in the Nineteenth Century: Suggestions for an Agenda.” Plenary address delivered at HOPOS 2002, the Fourth International Conference on the History of the Philosophy of Science, **Montreal, Canada**, 21–23 June 2002.

“Lost Wanderers in the Forest of Knowledge: Some Advice on How to Think about the Relation between Discovery and Justification.” Invited talk delivered to the Program in Science, Ethics, and Public Policy, **California Institute of Technology**, 6 June, 2002.

“Lost Wanderers in the Forest of Knowledge: Some Advice on How to Think about the Relation between Discovery and Justification.” Invited talk delivered at the workshop on “Revisiting Discovery and Justification,” **Max Planck Institut für Wissenschaftsgeschichte**, Berlin, 28 February–3 March, 2002.

“Values and Logical Empiricism: Some Reflections.” Invited talk delivered at the conference on “The Vienna Circle and Logical Empiricism,” **Universität Wien**, 12-14 July 2001.

2000–2001 Academic Year:

“A Brief on Behalf of Bohr.” Invited paper delivered to the Department of History and Philosophy of Science, **Indiana University**, 1 December 2000.

“‘Inner Perfection’: Einstein on Simplicity as a Criterion of Theory Choice.” Invited talk given to the Department of Philosophy, **Northern Illinois University**, 20 October 2000.

“‘Ein gegenseitiges Wechselspiel’: Reflections on the Relationship between History and Philosophy of Science.” Invited keynote address at the conference JASHOPS 2000 (Joint Atlantic Seminar on the History of Science), “Interactions Between the History and the Philosophy of Science,” **University of Pittsburgh**, 22-23 September 2000.

“Kith or Kin? On the Relationship between History and Philosophy of Science.” Invited paper delivered at the conference on “What Is to Be Done? History of Science in the New Millennium.” Fourth British-

North American Joint Meeting of the British Society for the History of Science, the Canadian Society for History and Philosophy of Science, and the History of Science Society, **St. Louis, Missouri**, 3-6 August 2000.

“Vertrieben und Verirrt: Politics and the Philosophy of Science in Exile.” Paper delivered at HOPOS 2000, the Third International Conference on the History of the Philosophy of Science, **Institut Wiener Kreis**, Vienna, Austria, 6-9 July 2000.

1999–2000 Academic Year:

“Two Left Turns Make a Right: On the Curious Political Career of North American Philosophy of Science at Mid-century.” Invited paper delivered to the Department of Philosophy, **University of Toronto**, 6 April 2000.

“Categoricity, Completeness, Entanglement, and Quantum Mechanics.” Invited paper delivered to the Department of Philosophy, **University of Illinois at Chicago**, 21 February 2000.

“Philosophical Reflections on the Ontology of Quantum Field Theory.” Invited paper that was to have been delivered at the conference on “Ontological Aspects of Quantum Field Theory” at the Zentrum für interdisziplinäre Forschung, **Universität Bielefeld**, 11-14 October 1999, but the trip was canceled owing to the impending birth of our first child.

1998–1999 Academic Year:

“Paul Hertz and the Axiomatics of Physical Theories.” Invited paper that was to have been delivered at the conference, “The Use of Axiomatics in the Exact Sciences. A Workshop on the Occasion of the 100th Anniversary of Hilbert’s Grundlagen der Geometrie,” **Georg-August-Universität Göttingen**, 11-12 June 1999, but the trip was canceled owing to the impending birth of our first child.

“A Brief on Behalf of Bohr.” Invited paper that was to have been delivered in the Bar-Hillel Colloquium for the History, Philosophy, and Sociology of Science, at the Cohn Institute for History and Philosophy of Science, **Tel Aviv, University**, 29 March 1999, but the trip was canceled owing to the impending birth of our first child.

“A Brief on Behalf of Bohr.” Invited paper delivered to the Committee on the Conceptual Foundations of Science, **University of Chicago**, 29 January 1999.

“‘And That Was the Way It Was.’ On the Historiography of the Philosophy of Science.” Invited paper delivered at the conference on “Philosophical Problems in the Historiography of Science,” **University of Pittsburgh**, Pittsburgh, Pennsylvania, 14-15 November 1998.

“A Brief on Behalf of Bohr.” Invited paper delivered at the conference on “Epistemological & Experimental Perspectives on Quantum Physics,” **Institute Vienna Circle and Erwin Schrödinger International Institute for Mathematical Physics**, Vienna, Austria, 3-6 September 1998.

1997–1998 Academic Year:

“Categoricity, Completeness, Entanglement, and Quantum Mechanics.” Invited paper delivered at the conference, “Space-Time, Quantum Entanglement, and Critical Epistemology: A Workshop in Honor of John Stachel,” **Max-Planck-Institut für Wissenschaftsgeschichte**, Berlin, Germany, 5-6 June 1998.

“Astride the Divided Line: Platonism, Empiricism, and Einstein’s Epistemological Opportunism.” Invited paper delivered to the Abteilung Philosophie, **Universität Bielefeld**, 3 June 1998.

“The End of the Science and Values Debate in 1950s Philosophy of Science.” Invited paper delivered at the workshop on “Logical Empiricism in North America,” **Harvard University**, 7-10 May 1998.

“The End of the Science and Values Debate in 1950s Philosophy of Science.” Invited paper delivered to the Department of Philosophy, **University of Minnesota**, 17 April 1998.

1996–1997 Academic Year:

“Quantum Gravity and the Problem of Individuation: An Historical and Philosophical Approach.” Invited talk delivered at the symposium, “Historical Perspectives and Philosophical Problems in the Unification of Physics,” The **First Annual Seven Pines Symposium**, Seven Pines Lodge, Lewis, Wisconsin, 14-18 May 1997.

“Philosophy of Science and Social Responsibility: Some Historical Reflections.” Invited paper delivered as part of a symposium on “Science and Social Responsibility: A Role for Philosophy of Science?” at the 1996 **Biennial Meeting of the Philosophy of Science Association**, Cleveland, Ohio, 1-3 November 1996.

1995–1996 Academic Year:

“Point Coincidences and Pointer Coincidences: Einstein on Invariant Structure in Spacetime Theories.” Invited paper delivered to the Department of Philosophy, **University of Notre Dame**, 26 January 1996.

“Point Coincidences and Pointer Coincidences: Einstein on Invariant Structure in Spacetime Theories.” Invited paper delivered to the Department of Philosophy, **Boston University**, 13 May 1996.

“‘And I Shall Not Mingle Conjectures and Certainties’: The Roots of Einstein’s Principle Theories/Constructive Theories Distinction.” Paper delivered at the **First International History of Philosophy of Science Conference (HOPOS)**, Roanoke, Virginia, 19-21 April 1996.

“Point Coincidences and Pointer Coincidences: Einstein on Invariant Structure in Spacetime Theories.” Paper delivered at the **IVth International Conference on the History of General Relativity**, Max-Planck-Institut für Wissenschaftsgeschichte, Berlin, Germany 31 July-3 August 1995.

1994–1995 Academic Year:

“Common Sense and the Mathematical Contagion: Einstein, Bohr, and the Role of Mathematics in Fundamental Physics.” Invited paper delivered at the session on “Mathematics and the Description of Nature” at the 61st Meeting of the **Southeastern Section of the American Physical Society**, Newport News, Virginia, 10-12 November 1994.

“Spacetime and Separability: Problems of Identity and Individuation in Fundamental Physics.” Invited paper delivered at the Symposium in Honor of Abner Shimony, **Boston Colloquium for Philosophy of Science**, 19-20 September 1994.

1993–1994 Academic Year:

“A Peek behind the Veil of Maya: The Historical Background of the Conception of Space as a Ground for the Individuation of Physical Systems.” Invited paper delivered to the Institut für Wissenschaftsgeschichte, **Georg-August-Universität Göttingen**, 31 May 1994.

“The History that We Are: Philosophy as Discipline and the Multiculturalism Debate.” Invited paper delivered at the Symposium on “Cross-Cultural Conversations,” Centre for Cultural Research, **Aarhus University**, Denmark, 26-27 May 1994.

“The Truth about EPR: Quantum Non-separability and the Historical Background to Einstein’s Objections to the Quantum Theory.” Invited talk to the Departments of Philosophy and Physics, **University of Cincinnati**, 16 May 1994.

“A Peek behind the Veil of Maya: The Historical Background of the Conception of Space as a Ground for the Individuation of Physical Systems.” Invited paper delivered, at the annual meeting of the North American Division of the Schopenhauer Society, **American Philosophical Association Central Division Annual Meeting**, Kansas City, Missouri, 4-7 May 1994.

“A Peek behind the Veil of Maya: The Historical Background of the Conception of Space as a Ground for the Individuation of Physical Systems.” Invited paper delivered to the Department of Philosophy, **Boston University**, 18 February 1994.

“A Peek behind the Veil of Maya: The Historical Background of the Conception of Space as a Ground for the Individuation of Physical Systems.” Invited paper delivered to the Department of Philosophy, **University of Notre Dame**, 15 February 1994.

“Relativity, *Eindeutigkeit*, and Monomorphism: Rudolf Carnap and the Development of the Categoricity Concept in Formal Semantics.” Invited paper delivered at the workshop on “The Origins of Logical Empiricism,” Minnesota Center for Philosophy of Science, **University of Minnesota**, 21-24 October 1993.

“The Prehistory of EPR: Einstein’s Early Worries about Quantum Nonlocality and Nonseparability, 1905-1935.” Invited talk given to the School of Physics and Astronomy Colloquium Series, **University of Minnesota**, 20 October 1993.

“Complementarity, Separability, and the Problem of Space in Niels Bohr’s Interpretation of Quantum Mechanics.” Invited paper delivered at the **XIXth International Congress of History of Science**, Zaragoza, Spain, 26 August 1993.

1992–1993 Academic Year:

“‘A kind of vessel in which the struggle for eternal truth is played out’—Albert Einstein and the Role of Personality in Science.” Invited paper delivered at the College of Arts and Sciences Institute on “The Natural History of Paradigms: Science and the Process of Intellectual Evolution,” **University of Indianapolis**, 13 May 1993.

“A Peek behind the Veil of Maya: The Historical Background of the Conception of Space as a Ground for the Individuation of Physical Systems.” Invited paper delivered to the Department of Philosophy, **Northwestern University**, 19 February 1993.

“A Peek behind the Veil of Maya: The Historical Background of the Conception of Space as a Ground for the Individuation of Physical Systems.” Invited paper delivered as part of the Twenty-third Annual Lecture Series, Center for Philosophy of Science, **University of Pittsburgh**, 12 February 1993.

1991–1992 Academic Year:

“Quantum Mechanics in Einstein’s Eyes.” Invited talk delivered at the conference on “Albert Einstein --Life and Work,” **Haus der Begegnung**, Ulm, Germany, 13-16 March 1992.

“Einstein’s Conventionalism.” Invited talk delivered to the **Centro Fiorentino di Storia e Filosofia della Scienza**, Florence, Italy, 10 October 1991.

“Locality, Separability, and the Physical Implications of the Bell Experiments.” Invited paper delivered at the conference on “Bell’s Theorem and the Foundations of Modern Physics,” **Centro Interdipartimentale di Ricerca in Epistemologia e Storia delle Scienze “F. Enriques”** of Bologna University, Cesena, Italy, 7-10 October 1991.

1990–1991 Academic Year:

“Out of the Labyrinth? Einstein, Hertz, and the Göttingen Answer to the Hole Argument.” Coauthored with John Norton. Invited paper delivered at the conference on “History and Philosophy of General Relativity,” **University of Pittsburgh at Johnstown**, 27-30 June 1991.

“Einstein, Kant, and the Origins of Logical Positivism.” Invited paper delivered at the Carnap-Reichenbach Centennial Conference, **University of Konstanz**, Germany, 21-24 May 1991.

“Old Quine in New Bottles: Empiricism, Naturalism, and Antifoundationalism in the Study of Science.” Invited paper delivered at the conference on “Science and Rhetoric,” Center for the Study of Science in Society, **Virginia Polytechnic Institute and State University**, Blacksburg, Virginia, 19-21 April 1991.

“‘And I Shall Not Mingle Conjectures and Certainties’: The Roots of Einstein’s Principle Theories/Constructive Theories Distinction.” Invited paper delivered at the **1990 Osgood Hill Conference** on “Einstein, the Early Years,” North Andover, Massachusetts, 4-6 October 1990.

1989–1990 Academic Year:

“Einstein and Duhem.” Invited paper delivered at the Conference on “Einstein in Context,” **Institute for the History and Philosophy of Science and Ideas, Tel Aviv University/Van Leer Jerusalem Institute**, Tel Aviv and Jerusalem, Israel, 23-26 April 1990.

“Einstein and Duhem.” Invited paper delivered to the Program in the History and Philosophy of Science and Technology, **Cornell University**, 14 March 1990.

“Einstein and *Eindeutigkeit*: A Neglected Theme in the Philosophical Background to General Relativity.” Invited paper delivered at the workshop on “Perspectives on Philosophy of Science: Antecedents and Revisions,” **Northwestern University**, 2-3 March 1990.

“Einstein and Duhem.” Invited paper delivered to the Department of Philosophy, **Pennsylvania State University**, 26 January 1990.

“‘Nicht sein kann was nicht sein darf,’ or the Prehistory of EPR, 1909-1935: Einstein’s Early Worries about the Quantum Mechanics of Composite Systems.” Invited paper delivered at the Conference on “Sixty-Two Years of Uncertainty: Historical, Philosophical, and Physics Inquiries into Quantum Mechanics,” “**Ettore Majorana**” **Centre for Scientific Culture, International School of History of Science**, Erice, Italy, 5-14 August 1989.

1988–1989 Academic Year:

“Einstein and Duhem.” Paper delivered at the Conference on “Pierre Duhem: Historian and Philosopher of Science,” Center for the Study of Science in Society, **Virginia Polytechnic Institute and State University**, Blacksburg, Virginia, 16-18 March 1989.

“Ask Not for Whom Bell’s Theorem Tolls, It Tolls for Thee: The Jarrett Decomposition Theorem and the Physical Significance of Bell Non-Locality.” Invited talk given to the Department of Physics, **University of Kentucky**, 20 January 1989.

“Locality, Separability, and the Bell Experiments: What Would Einstein Have Said, and Would He Have Been Right?” Invited talk given to the Department of Physics, **Miami University**, Oxford, Ohio, 30 November 1988.

“Einstein and *Eindeutigkeit*: A Neglected Theme in the Philosophical Background to General Relativity.” Invited paper delivered at the Second International Conference on the History of General Relativity, **Centre International de la Rencontres Mathématiques, Campus Universitaire de Marseille-Luminy**, France, 6-9 September 1988.

1987–1988 Academic Year:

“Holism, Separability, and the Ontological Implications of the Bell Experiments.” Invited paper delivered at the Conference on “Philosophical Lessons from Quantum Theory,” **University of Notre Dame**, 1-3 October 1987.

1986–1987 Academic Year:

“Einstein’s Conventionalism.” Invited paper delivered to the Department of Philosophy, **Johns Hopkins University**, 25 February 1987.

1985–1986 Academic Year:

“What Makes a Classical Concept Classical? Toward a Reconstruction of Niels Bohr’s Philosophy of Physics.” Invited paper delivered to the Laboratorium für Physikalische Chemie, **ETH**, Zurich, 27 May 1986.

“Einsteins Wissenschaftsphilosophie.” Invited talk given to the Abteilung Philosophie, **Universität Bielefeld**, 12 May 1986.

“Einstein über Trennbarkeit und Lokalität. Die eigentliche Gründe Einsteins für die Unvollkommenheit der Quantenmechanik.” Invited talk given to the Institut für Geschichte der Naturwissenschaften, Mathematik und Technik, **Universität Hamburg**, 6 May 1986.

“Einsteins Konventionalismus.” Invited talk given to the Philosophisches Seminar, **Universität Heidelberg**, 25 April 1986, and to the Forschungsinstitut für Technik- und Wissenschaftsgeschichte, **Deutsches Museum**, Munich, 14 April 1986.

“The Role of Classical Concepts in Bohr’s Philosophy of Nature.” Invited paper delivered to the **Boston Colloquium for the Philosophy of Science**, 11 March 1986.

“Locality, Separability, Einstein, and the Bell Experiments.” Invited talk given to the Foundations of Physics Seminar, Department of Physics, **Boston University**, 11 October 1985.

1983–1984 Academic Year:

“Quantum Mechanics and Scientific Realism.” Invited paper read to the Departments of Philosophy, **Bellarmino College**, 28 February 1984

“Einstein on Locality and Separability.” Invited paper delivered to the **Boston Colloquium for the Philosophy of Science**, 14 February 1984.

“Realism and Conventionalism in Einstein’s Philosophy of Science: The Einstein-Schlick Correspondence.” Contributed paper read at the **7th International Congress for Logic, Methodology and Philosophy of Science**, Salzburg, Austria, 12 July 1983.

1982–1983 Academic Year:

“Was Einstein Really a Realist?” Invited paper delivered to a meeting of the Society of Fellows in the Humanities, **Columbia University**, 19 April 1983.

“Einstein’s Late Views on Separability and Locality.” Invited talk given at the Physics Department Colloquium, **University of Kentucky**, 4 March 1983.

“How to Naturalize Epistemology. Outlines of an Operant Theory of Knowledge.” Invited paper read to the Department of Social and Philosophical Studies, College of Education, **University of Kentucky**, 25 February 1983.

“Quantum Mechanics and Scientific Realism.” Invited paper read to the Department of Philosophy, **Transylvania University**, 9 November 1982.

1980–1981 Academic Year:

“What Makes a Classical Concept Classical? Toward a Radical Reconstruction of Niels Bohr’s Philosophy of Physics.” Invited paper read to the University History and Philosophy of Science Seminar, **Columbia University**, 14 April 1981.

“Quantum Mechanics and Scientific Realism.” Invited paper read to the Philosophy Department Colloquium, **Columbia University**, 19 February 1981.

“Galileo, Descartes, and the Scientific Revolution.” Invited talk given to the staff of Contemporary Civilization, **Columbia University**, 22 October 1980.

PANEL DISCUSSIONS

“In Defense of (Virtuous) Autonomous Weapons.” Invited panelist for the symposium on “Artificial Intelligence: Bridging Law & Technology,” sponsored by the **University of Notre Dame Law School**, 1 April 2022.

“The Future of Legal Personhood for Superintelligent AI Systems.” Invited panelist for the online “Artificial Intelligence and Robotics (AI) Virtual National Institute 2020,” sponsored by the **American Bar Association**, Chicago, IL, 28 October 2020.

“The Use of AI and the Ethical Question.” Invited panelist for the online forum on “Artificial Intelligence and Catholic Universities,” hosted by the **International Federation of Catholic Universities**, Paris, 19-20 October 2020.

“Ethics, Technology and the Future of War & Security.” Invited panelist for the conference, “The Future of War: Ethical, Legal and Social Implications,” **Purdue University**, 14 May 2019.

“AI, Automation, and the Good Life.” Invited panelist the public forum in conjunction with the 2016 Pacific Division Meeting of the American Philosophical Association, **San Francisco, California**, 31 March 2016..

“Can We Save the World with Nuclear Energy?” Invited panelist for the discussion following Gwyneth Cravens’s talk about her book, *Power to Save the World: The Truth about Nuclear Energy*. **University of Notre Dame**, 6 October 2015.

“Cyberwarfare and Ethics.” Invited panel presentation, Naval Leadership Weekend, **University of Notre Dame**, 22 February 2014.

“I Sing the Body Electric.” Invited presentation for a panel discussion on “Machine/Human Interface” at the 2013 Fall conference, “Fearfully and Wonderfully Made: The Body and Human Identity,” Notre Dame Center for Ethics and Culture, **University of Notre Dame**, 8 November 2013.

“Which Wars Do We Fight? Executing the Right Decisions under Fire?” Invited panel presentation at the Naval Leadership Weekend, **University of Notre Dame**, 23 February 2013.

“What Do We Have to Say to One Another? On Relations between the Sciences, Engineering, and Humanities.” Invited panelist at the History of Science Society Welcoming Conference, **University of Notre Dame**, 8 June 2012.

“How Philosophers of Science Can Take Up More Socially Relevant Roles.” Invited panelist at the Twenty-first Biennial Meeting of the Philosophy of Science Association, **Pittsburgh, Pennsylvania**, 8 November 2008.

Roundtable Discussion leader. “Historical and Philosophical Perspectives on the Interplay of Physics and Mathematics,” The **Second Annual Seven Pines Symposium**, Seven Pines Lodge, Lewis, Wisconsin, 13-17 May 1998.

“Philosophy and Classical Physics: HPS for Science and Engineering Majors.” Organizer and panelist at the **Third International History, Philosophy, and Science Teaching Conference**, Minneapolis, Minnesota, 29 October-2 November 1995.

“Electronic Communication in Science Studies.” Invited panelist at the meeting of the **Society for Social Studies of Science**, New Orleans, Louisiana, 13-16 October 1994.

“Political Correctness.” Invited panelist at a meeting of the **North American Society for Social Philosophy, American Philosophical Association Central Division Meeting**, Louisville, Kentucky, 24-26 April 1992.

“Cultural Diversity and the Feminist Mission.” Invited panelist. **University of Kentucky**, 11 April 1992.

“Editing of Scientific Papers.” Invited panelist at the conference on History and Philosophy of General Relativity, **University of Pittsburgh at Johnstown**, 27-30 June 1991.

COMMENTARIES

Matthew Stanley, “The Virtue of Productive Uncertainty, or, What to Do When You Don't Know Something.” Conference on **Practicing Science: Virtues, Values, and the Good Life**. University of Notre Dame London Global Gateway, 9 August 2018.

Tom McLeish, “Academic Freedom, Religion, and the Natural Sciences.” Conference on **Transcending Orthodoxies: Re-examining Academic Freedom in Religiously-Affiliated College and Universities**. University of Notre Dame, 30 October 2015.

Peter Achinstein, “Theory, Experiment, and Cathode Rays.” **Conference on the Role of Experiment in Scientific Change**, Virginia Polytechnic Institute and State University, 30 March-1 April 1990.

Rudolf Haller, “Atomism and Holism in the Vienna Circle Philosophy of Science.” **Boston Colloquium for the Philosophy of Science**, 12 April 1988.

Jon Jarrett, “Quantum Mechanics, Holism, and Locality.” **American Philosophical Association Central Division Meeting**, Chicago, 30 April-2 May 1987.

Howard Stein, “On Metaphysics and Method in Newton.” **Boston Colloquium for the Philosophy of Science**, 28 April 1987.

Larry Mayhew, “Bridging vs. Reducing the Indeterminacy of Translation,” **Kentucky Philosophical Association, Spaulding College**, Louisville, Kentucky, 14 November 1981.

REFEREEING

Publishers: Bloomsbury; Cambridge University Press; Oxford University Press; Princeton University Press; University of Chicago Press; Kluwer; Routledge; Columbia University Press; Birkhäuser Boston; University of Pittsburgh Press; Johns Hopkins University Press; State University of New York Press; Blackwell; Rowman & Littlefield; University of Notre Dame Press.

Journals: *American Journal of Physics*; *Studies in History and Philosophy of Modern Physics*; *Physics in Perspective*; *Philosophy of Science*; *International Studies in the Philosophy of Science*; *Noûs*; *Foundations of Physics*; *Synthese*; *Journal of Philosophy*; *Review of Metaphysics*; *Journal for the History of Philosophy*; *Perspectives on Science*; *Studies in History and Philosophy of Science*; *Philo*; *Hypatia*, *Ecological Psychology*, *Annals of Science*, *Philosophy & Technology*..

Foundations: National Science Foundation; Social Sciences and Humanities Research Council of Canada; Humboldt Stiftung; European Research Commission; Hungarian Academy of Sciences.

OTHER PROFESSIONAL ACTIVITIES

External Project Member of the project on “Warring with Machines: Military Applications of Artificial Intelligence and the Relevance of Virtue Ethics,” under the leadership of Gregory M. Reichberg, at the Peace Research Institute Oslo, 2020-2023.

Editorial Board, *The Journal of Sociotechnical Critique*, 2020 to present.

Co-organizer (with Liu Zhe) of the conference on “Humanity and Legal Governance in the Digital Era,” Beijing Forum, Peking University, 1-3 November 2019.

Chair, Committee on the International Freedom of Scientists, American Physical Society, January 2016-December 2017.

Member, Committee on the International Freedom of Scientists, American Physical Society, January 2015-December 2019.

Co-organizer (with Laurel Riek, Woody Hartzog, Ajung Moon, and Ryan Calo) of the daylong workshop, “The Emerging Policy and Ethics of Human Robot Interaction,” as part of the 2015 annual Human-Robot Interactions meeting, Portland, Oregon, March 2-5, 2015.

Organizer of the conference, “Ahead Of The Curve: Anticipating Ethical, Legal, and Societal Issues Posed by Emerging Weapons Technologies,” University of Notre Dame, April 22-23, 2014.

Editorial Board, *The Journal of Philosophy, Science & Law*, 2013 to 2017.

Editorial Advisory Board, *Philing: Philosophical Inquiries*, Edizioni ETS, Pisa, 2012 to present.

Editorial Board, *History and Philosophy of Technoscience*, Pickering and Chatto Publishers, London., 2012 to present.

Chair, Forum for the History of Physics, American Physical Society, May 2013-April 2014

Program Committee for the conference “Time and Matter (TAM 2013),” Venice, Italy, 4-8 March 2013.

Executive Secretary for ISME, the International Society for Military Ethics, June 2012 to present.

Chair, Cyberconflict Thrust Group, CETMONS–Consortium on Emerging Technologies, Military Operations, and National Security, July 2011-present.

Member, Executive Committee, CETMONS–Consortium on Emerging Technologies, Military Operations, and National Security, July 2011-present.

Vice-Chair, Forum for the History of Physics, American Physical Society, May 2012-April 2013.

Co-organizer, with Martin Carrier, of the conference on “The Social Relevance of Philosophy of Science,” Zentrum für interdisziplinäre Forschung, Universität Bielefeld, 11-13 June 2012.

Chair-Elect, Forum for the History of Physics, American Physical Society, May 2011-April 2012.

National Science Foundation, Various review panels.

Committee on Publications, History of Science Society, 2009-2012; Chair, 2012.

Founding Co-editor, *HOPOS – The Journal of the International Society for History of Philosophy of Science*, University of Chicago Press. Launched in 2010, with publication beginning in 2011.

Wissenschaftlicher Beirat/Editorial Advisory Board, *Philosophia Naturalis*, Vittorio Klostermann Verlag, Frankfurt am Main.

Advisory Committee for the conference, “Time and Matter (TAM 2010), Budva, Montenegro, 4-8 October 2010.

Program Committee, HOPOS 2010 – The Biennial Meeting of the International Association for the History of Philosophy of Science, Budapest, Hungary, 23-27 June 2010.

Co-organizer of the faculty workshop on “The ‘Two Cultures’ at Fifty: Reconsidering the Roles of Science, Engineering, and the Humanities in a ‘Liberal Education.’” University of Notre Dame, Fall Semester 2010.

Governing Board, International History, Philosophy & Science Teaching Group, 2007 to 2010.

Program Director for the 2009 meeting of IHPST, the International History and Philosophy of Science Teaching Group. University of Notre Dame, 24-28 June 2009.

Steering Committee for the conference series, &HPS - Integrated History and Philosophy of Science, 2007 to present.

Co-Convener, with John Norton, of “&HPS2 – The Second Conference on Integrated History and Philosophy of Science,” University of Notre Dame, March 12-15, 2009.

Alumni Advisory Board, Lyman Briggs School, Michigan State University.

Co-Convener, with John Norton, of “&HPS – Integrated History and Philosophy of Science,” University of Pittsburgh, 11-14 October 2007.

Program Committee for the conference “Time and Matter (TAM 2007),” Bled, Slovenia, 26-31 August 2006.

Committee on Programs and Meetings, History of Science Society, 2006-2009.

Co-Director. “History and Foundations of Quantum Physics” (HFQP) Project. A collaborative research initiative involving the Max Planck Institute for History of Science (MPIWG), the Fritz Haber Institute (FHI), Johns Hopkins University, the University of Minnesota, Notre Dame, and the University of Pittsburgh.

Co-organizer, with Michael Wiescher, of the lecture series, “Thoughts on the Unthinkable: Perspectives on Nuclear Weapons and Warfare,” University of Notre Dame, Fall 2005.

Co-organizer, with Martin Carrier and Peter Weingart, of the “Notre Dame–Bielefeld Interdisciplinary Conference on Science and Values,” Zentrum für interdisziplinäre Forschung, Universität Bielefeld, 9-12 July 2003.

Wissenschaftlicher Beirat, Moritz-Schlick-Projekt.

Co-organizer, with Ernan McMullin, of the conference, “Philosophical Issues in Physics: A Conference in Honor of James T. Cushing (1937-2002),” University of Notre Dame, 5-6 November 2002.

Program Committee for the conference “Time and Matter: An International Colloquium on the Science of Time,” Venice, Italy, 11-17 August 2002.

Advisory Board of the Charles Morris Papers Project.

Organizer, Ernan McMullin Perspectives Lectures, “Kant, Kuhn, and the Rationality of Science,” with speakers Michael Friedman, Rob DiSalle, and Alan Richardson, University of Notre Dame, 6-7 April 2001.

Scientific Board of the Institute Vienna Circle and Advisory Editorial Board of its series “Vienna Circle Institute Yearbooks,” published by Kluwer.

Program Committee, Third International Conference on the History of the Philosophy of Science, Vienna, Austria, 6-9 July 2000.

Chair of Program Committee and Organizer, Fifth International Conference on the History and Foundations of General Relativity, University of Notre Dame, 9-11 July 1999.

Chair of Program Committee, Sixteenth Biennial Meeting of the Philosophy of Science Association, Kansas City, Missouri, October 1998.

Program Committee, Second International Conference on the History of the Philosophy of Science, University of Notre Dame, 12-15 March 1998.

Co-organizer, with Ernan McMullin, of the conference, “Dissent and Orthodoxy in Quantum Mechanics” (in honor of James T. Cushing’s Sixtieth Birthday), University of Notre Dame, 26-27 September 1997.

Executive Council, Phi Sigma Tau Philosophy Honorary, 1996-present.

Advisory Board, Seven Pines Symposium Series, 1996-2015.

Co-chair of Program Committee, First International Conference on the History of the Philosophy of Science, Roanoke, Virginia, 19-21 April 1996.

Organizer and chair of symposium, “Philosophy and Classical Physics: HPS for Science and Engineering Majors,” at the October/November 1995 Third International History, Philosophy, and Science Teaching Conference, Minneapolis, Minnesota.

Chair of colloquium session, “Positivism: 19th and 20th Century,” at the Annual Meeting of the History of Science Society, Minneapolis, Minnesota, 26-29 October 1995.

Visiting Scholar for a Faculty Development Project, *Discovering Modernity: Western Visions of the Modern*, at Southern Maine Technical College, Portland, Maine, 5-9 June 1995.

Nominating Committee, Philosophy of Science Association, 1994-1996.

Chair of colloquium session, “Spacetime and Related Matters,” at the Biennial Meeting of the Philosophy of Science Association, New Orleans, Louisiana, 13-16 October 1994.

Program Committee, Fourteenth Biennial Meeting of the Philosophy of Science Association, New Orleans, Louisiana, 14-16 October 1994.

Co-organizer, with Catherine Chevalley, of session on “The Construction of Quantum Mechanics. Physical Problems and Philosophical Traditions,” at the XIXth International Congress of History of Science, Zaragoza, Spain, 26 August 1993.

Organizer and chair of symposium, “Recent Work in the History of the Philosophy of Science,” at the October 1990 Philosophy of Science Association Biennial Meeting, Minneapolis, Minnesota.

HOPOS, the History of Philosophy of Science Working Group:

Co-founder (with Alan Richardson);
Steering Committee, 1993-2004 (Chair, 1993-94);
Manager of HOPOS-L electronic discussion list (1992-2007).

Advisory Editor for the journal, *Perspectives on Science*.

Member of the Editorial Boards of the journals, *Journal of Sociotechnical Critique*, *Philosophy of Science*, *Physics in Perspective*, *Studies in History and Philosophy of Modern Physics*, and *International Studies in the Philosophy of Science*.

Consultant for the Kentucky Humanities Council.

PROFESSIONAL SOCIETIES

Philosophy of Science Association; History of Science Society; HOPOS—International Society for the History of Philosophy of Science; American Philosophical Association; American Physical Society; American Association for the Advancement of Science; Sigma Xi; Phi Sigma Tau Philosophy Honorary; International Society for Military Ethics.

UNIVERSITY SERVICE

Departmental and Program Committees and Offices: **Notre Dame:** History and Philosophy of Science Graduate Program Steering Committee; Full Professors Committee; Committee on Appointments and Promotions; Graduate Committee; Undergraduate Committee; Junior Philosophy of Physics Position Search Committee; Junior Philosophy of Science Position Search Committee. **University of Kentucky:** Department Chair; Executive Committee (Chair); Curriculum Committee (Chair); History of Philosophy Examination Committee; Metaphysics and Epistemology Examination Committee (Chair); Speakers Committee; Computer Liaison; Library Liaison.

College Committees and Offices: **Notre Dame:** Director, Reilly Center for Science, Technology, and Values; Director, History and Philosophy of Science Graduate Program; Ad Hoc Committee to Review Ph.D. in Literature Program; College Council; Reilly Center Advisory Committee; Science, Technology, and Values Program Steering Committee. **University of Kentucky:** Judaic Studies Program Planning Committee; Undergraduate German Studies Program Coordinating Committee; German Studies Program Planning Committee; Political Science Department Performance Review Committee; Experimental General Studies Program Planning Committee; Endowed Humanities Professorship Search Committee; Physics Department Performance Review Committee; Library Committee; Area C Curriculum Committee.

Graduate School Committees and Offices: **Notre Dame:** Ad Hoc Committee to Review Professional Masters' Degree Programs; Ad Hoc Committee on the Creation of a Campus-wide Program in Research Ethics Training; Ad Hoc Committee on the Creation of a University Postdoctoral Fellowship Program; Graduate Council. **University of Kentucky:** Graduate Council; Ad Hoc Master of Liberal Arts Degree Committee; William Sturgill Award Committee.

University Committees and Offices: **Notre Dame:** Notre Dame Technology Ethics Center Curriculum Committee; Science and Technology Policy Initiative Planning Committee; Multidisciplinary Research Building Advisory Committee; Advisory Committee for GLOBES - Global Linkages of Biology, Engineering, and Society Graduate Minor; Internal Advisory Board for cSEND - the Center for Sustainable Energy; FSRP Review Panel, Office of Research; University Senate, Chair of Senate Committee on Academic Affairs. **University of Kentucky:** University Senate; University Senate Research Committee (Chair); University Senate Ad Hoc Committee on Committees; James Still Fellowship Board; University Forum/ Professorship Committee (Chair); Major Research Equipment Grant Committee; Ad Hoc Merit Review Appeal Committee (Chair); Western Civilization Subcommittee of the General Studies Review Committee.

COURSES TAUGHT

Graduate Seminars and Courses: **Notre Dame:** Einstein's Philosophy of Science; Dewey, Quine, and Twentieth-century American Naturalism; Historical Foundations of the Quantum Theory; Philosophy of Space and Time; Philosophy of Science; History of the Philosophy of Science, 1700-1900. **University of Kentucky:** Philosophy of Space and Time; Einstein as a Philosopher of Science; History of the Vienna Circle; Foundations of Quantum Mechanics; Feminist Philosophy of Science; Social Constructivist Theories of Science; Quine's Philosophy of Language; Richard Rorty and Contemporary Anti-Foundationalism.

Advanced Undergraduate/Graduate: **Notre Dame:** Ethics and Policy in Technology Management; Science and Theology; Philosophy of Science; Einstein's Philosophy of Science. **University of Kentucky:** History of Analytic Philosophy; Philosophy of Scientific Method; Philosophy of Space and Time; Analytic Philosophy; Philosophy of the Social Sciences; Symbolic Logic II: Introductory Metatheory.

Introductory and Intermediate Undergraduate: **Notre Dame:** Data Ethics; Technology and Innovation Ethics; Robot Ethics; Ethics of Emerging Weapons Technologies; Introduction to Philosophy, Philosophical Issues in Physics; Philosophy and Classical Physics; Modern Physics and Moral Responsibility. **University of Kentucky:** Introduction to Philosophy; Introductory Logic; Contemporary Civilization; The Social History of Twentieth-Century Physics; Philosophy and Classical Physics; Philosophy and Modern Physics; Symbolic Logic I, Individualism and the Birth of the Modern.

DISSERTATIONS DIRECTED

Kevin Schieman. "In View of Ourselves: On the Benefits of Neuroscientific Explanation in Machine Ethics." University of Notre Dame, 2022.

Jamee Elder. "The Epistemology of Gravitational-Wave Astrophysics." University of Notre Dame, 2020.

Jude Galbraith. "Researcher Responsibilities in Climate Engineering: Values, Ethics, and Environmentally Disruptive Technology Innovation." University of Notre Dame, 2020.

Jeremy Steeger. "Quantum Probabilism: New Foundations for Subjective Quantum Probabilities." (Co-directed with Nicholas J. Teh.) University of Notre Dame, 2019.

Mark Mills. “Émile Meyerson’s Neo-Kantian *Épistémologie*.” (Co-directed with Gary Gutting.) University of Notre Dame, 2015.

Daniel Hicks. “Science, Ends, and Democracy.” University of Notre Dame, 2012.

Iulian Toader. “Hermann Weyl’s Symbolic Constructivism.” (Co-directed with Michael Detlefsen.) University of Notre Dame, 2012.

Lee Mayo. “A Philosophical Inquiry into the Experimental Use of Monte Carlo Computer Simulations in Science.” University of Notre Dame, 2012.

Elise Crull. “Quantum Decoherence and Interlevel Relations.” University of Notre Dame, 2011.

Brandon Fogel. “Epistemology of a Theory of Everything: Weyl, Einstein, and the Unification of Physics.” University of Notre Dame, 2008.

James Brian Pitts. “General Covariance, Artificial Gauge Freedom, and Empirical Equivalence.” University of Notre Dame, 2008.

Daniel McKaughan. “Toward a Richer Vocabulary for Epistemic Attitudes: Mapping the Cognitive Landscape.” University of Notre Dame, 2007.

Justin Biddle. “Socializing Science: On the Epistemic Significance of the Institutional Context of Science.” University of Notre Dame, 2006.

Peter Bokulich. “Horizons of Description: Black Holes and Complementarity.” University of Notre Dame, 2003.

Patrick McDonald. “Hermann von Helmholtz’s Epistemology of Experiment: The Case of Physiological Acoustics.” University of Notre Dame, 2001.