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I. Education

- (1) The Johns Hopkins University, Baltimore, Maryland. M.A. in Philosophy, May, 1992. Certificate in graduate program in History and Philosophy of Science, June, 1995. Ph.D. in Philosophy, May, 1998.
- (2) Grinnell College, Grinnell, Iowa. B.A. in Physics, May, 1986.

II. Appointments

- (1) 2016 – present: Professor, Dept. of Philosophy, Saint Louis University
- (2) 2018 – present: Coordinator of Graduate Studies, Dept. of Philosophy, Saint Louis University
- (3) 2006 – 2016: Associate Professor, Dept. of Philosophy, Saint Louis University
- (4) 2001 – 2006: Assistant Professor, Dept. of Philosophy, Saint Louis University
- (5) Spring 2001: Visiting Assistant Professor, Dept. of Philosophy, Boston University
- (6) 1997 – 2001: Assistant Professor, Dept. of English and Philosophy, Arkansas State University

III. Authored Books

- (1) *An Introduction to the Philosophy of Science*. Cambridge University Press, 2014.
- (2) *The Evidence for the Top Quark: Objectivity and Bias in Collaborative Experimentation*. Cambridge University Press, 2004.

IV. Edited Volumes

- (1) “Experimental and Theoretical Knowledge,” special issue of *The Modern Schoolman*, 87 (2011), nos. 3-4.
- (2) “Statistical Science and Philosophy of Science” (co-edited with D. Mayo and A. Spanos), special issue of *Rationality, Markets, and Morals*, 2 (2011).
- (3) “Error and Methodology in Practice” (co-edited with J. Miller and D. Mayo), special issue of *Synthese*, 163 (2008), no. 3.

V. Articles (refereed)

- (1) “How Uncertainty Can Save Measurement from Circularity and Holism” (with Sophie Ritson) *Studies in History and Philosophy of Science*, forthcoming.
- (2) “Securing the Empirical Value of Measurement Results.” *British Journal for the Philosophy of Science*, 71 (2020): 87–113.
- (3) “‘Agreement’ in the IPCC Confidence Measure” (with Bill Rehg). *Studies in History and Philosophy of Modern Physics*, 57 (2017): 126–134.

- (4) "Pragmatic Warrant for Frequentist Statistical Practice: The Case of High Energy Physics." *Synthese*, 194 (2017): 355–376. DOI 10.1007/s11229-016-1111-3.
- (5) "Strategies for Securing Evidence through Model Criticism." *European Journal for Philosophy of Science*, 2 (2012): 21–43. DOI 10.1007/s13194-011-0022-x.
- (6) "Internalist and Externalist Aspects of Justification in Scientific Inquiry" (with Aaron Cobb). *Synthese*, 182 (2011): 475–492. DOI 10.1007/s11229-010-9754-y.
- (7) "Error-statistical Elimination of Alternative Hypotheses." *Synthese*, 163 (2008), 397–408.
- (8) "The CDF Collaboration and Argumentation Theory: The Role of Process in Objective Knowledge" (with Bill Rehg). *Perspectives on Science*, 16 (2008), 1–25.
- (9) "Robust Evidence and Secure Evidence Claims." *Philosophy of Science*, 71 (2004), 467–88.
- (10) "What Experiment Did We Just Do? Counterfactual Error Statistics and Uncertainties about the Reference Class." *Philosophy of Science* 69 (2002), 279–99.
- (11) "Lost Origins of the Third Generation of Quarks: Theory, Philosophy, and Experiment." *Physics in Perspective* 3 (2001), 210–229.
- (12) "Golden Events and Statistics: What's Wrong with Galison's Image/Logic Distinction?" *Perspectives on Science* 7 (1999), 196–230.
- (13) "Logic, Liberty, and Anarchy: Mill and Feyerabend on Scientific Method." *The Social Science Journal* 36 (1999), 603–614.
- (14) "Novelty, Severity, and History in the Testing of Hypotheses: The Case of the Top Quark." *Philosophy of Science* 63 (1996, Proceedings of PSA 96), S248–255.

VI. Articles (invited)

- (1) Contribution to book symposium, "Objective Evidence and Rules of Strategy: Achinstein on Method." *Metascience*, 23 (2014), 413–42.
- (2) "Dirac's 'fine-tuning problem': A constructive use of anachronism?" *Perspectives on Science* (Special &HPS3 Issue), 20 (2012), 476–503.
- (3) "Comments on William Harper's 'Isaac Newton's Scientific Method'." *The Modern Schoolman* (Special Issue: Experimental and Theoretical Knowledge) 87 (2011), 303–13.
- (4) "Evidence and Justification in Groups with Conflicting Background Beliefs." *Episteme*, 7 (2010), 232–47.
- (5) "Evidential Collaborations: Epistemic and Pragmatic Considerations in 'Group Belief'." *Social Epistemology*, 21 (2007), 321–34.

VII. Book Chapters

- (1) "Decisions, Decisions: Inductive Risk and the Higgs Boson." In Kevin Elliott and Ted Richards (eds.), *Exploring Inductive Risk*. Oxford University Press, 2017, pp. 37–55.
- (2) "Experimental Knowledge in the Face of Theoretical Error." In Marcel Boumans, Giora Hon, and Arthur Petersen (eds.), *Error and Uncertainty in Scientific Practice*. Pickering and Chatto, 2014, pp. 39–55..
- (3) "Evidence and Justification." In Greg Morgan (ed.), *Philosophy of Science Matters: The Philosophy of Peter Achinstein*. Oxford University Press, 2011, pp. 216–30.

- (4) "Agency and Objectivity in the Search for the Top Quark." In Peter Achinstein (ed.), *Scientific Evidence: Philosophical Theories and Applications*. Johns Hopkins University Press, 2005, pp. 165–84.

VIII. Reviews and Other Publications

- (1) Review of *Anomaly! Collider Physics and the Quest for New Phenomena at Fermilab* by Tommaso Dorigo. Forthcoming in *Physics Today*.
- (2) Review of *Shifting Standards: Experiments in Particle Physics in the Twentieth Century* by Allan Franklin (with Heráclio Tavares). *HOPOS*, 6 (2016), 158–62.
- (3) Review of *Physical Theory: Method and Interpretation*, edited by Lawrence Sklar. *Notre Dame Philosophical Reviews* June 1, 2015.
<http://ndpr.nd.edu/news/58161-physical-theory-method-and-interpretation/>
- (4) Review of *Evidence and Method: Scientific Strategies of Isaac Newton and James Clerk Maxwell* by Peter Achinstein. *Isis*, 105 (2014), 672–73.
- (5) "(Almost) All about Error." Review of *Error and Inference: Recent Exchanges on Experimental Reasoning, Reliability, Objectivity, and Rationality*, edited by Deborah Mayo and Aris Spanos. *Metascience*, 21 (2012), 709–13.
- (6) Review of *Identity in Physics: A Historical, Philosophical, and Formal Analysis* by Steven French and Décio Krause, *British Journal for the History of Science*, 42 (2009), 145–46.
- (7) Review of *No Easy Answers: Science and the Pursuit of Knowledge* by Allan Franklin and *Pauli's Exclusion Principle: The Origin and Validation of a Scientific Principle* by Michela Massimi. *British Journal for the History of Science*, 40 (2007), 455–57.
- (8) Review of *The Philosophy of Scientific Experimentation*, edited by Hans Radder. *Philosophy of Science*, 72 (2005), 525–28.
- (9) Review of *Selectivity and Discord: Two Problems of Experiment* by Allan Franklin. *Metascience*, 13 (2004), 75–78.
- (10) Review of *Natural Laws in Scientific Practice* by Marc Lange. *Review of Metaphysics* 56 (2002), 435–36.
- (11) Review of *The Scopes Trial: A Photographic History* by Edward Caudill, Edward Larson, and Jesse Fox Mayshark. *Arkansas Review* 32 (2001), 78–79.
- (12) Review of *Image and Logic* by Peter Galison. *Philosophy of Science* 67 (2000), 339–41.
- (13) "The Discovery of the Electron." Text for website sponsored by the American Institute of Physics.
www.aip.org/history/electron

IX. Synergistic Activities

- (1) Consulting Editor, *Res Philosophica*, 2012–present.
- (2) Local organizer and program committee chair, Philosophy of Scientific Experimentation 6: Uncertainty in Experimental Contexts (PSX6). Saint Louis University, St. Louis, Missouri. Originally scheduled, September 25–26, 2020, postponed due to Coronavirus pandemic.
- (3) Lecturer, Summer School on the Philosophy, History, and Sociology of Particle Physics, organized by the Epistemology of the Large Hadron Collider Project, Wuppertal, Germany, 2018.

- (4) Organizer for “Model Landscapes and Event Signatures: Using Data to Explore Phenomena Beyond the Standard Model of Elementary Particle Physics,” Symposium presented at the 2018 meeting of the Philosophy of Science Association, Seattle, Washington.
- (5) Cooperation partner, “Epistemology of the Large Hadron Collider” project.
- (6) Workshop discussant, “Statistical Science and Philosophy of Science: Where Should/Do They Meet in 2010 (and Beyond)?” London School of Economics, June 21-22, 2010.
- (7) Organizer for Henle Conference on Experimental and Theoretical Knowledge at Saint Louis University. March 26–27, 2010.
- (8) Co-founder and treasurer for Saint Louis Area Philosophy of Science Association (SLAPSA). Organizer for SLAPSA I, February 28, 2009, and for SLAPSA VI, February 15, 2014.
- (9) Program, Planning, and Publicity Committee, First Symposium on Philosophy, History, and Methodology of ERROR (Experimental Reasoning, Reliability, Objectivity, and Rationality), Blacksburg, Virginia, June 2006.
- (10) Organizer for “Collaboration Experiments,” a workshop at the 2004 meeting of the Philosophy of Science Association, Austin, Texas.
- (11) I have served as referee for articles submitted to *British Journal for the Philosophy of Science*, *Philosophy of Science*, *Synthese*, *Studies in the History and Philosophy of Science*, *Studies in History and Philosophy of Modern Physics*, *Erkenntnis*, *Episteme*, *Philosophy Compass*, *Perspectives on Science*, *Historical Studies in the Natural Sciences*, *Logic Journal of the IGPL*, *The Philosopher’s Imprint*, *Ratio*, *Res Philosophica*, and *Philosophical Studies*, as a manuscript referee for Cambridge University Press, Johns Hopkins University Press, and University of Pittsburgh Press, and as a panelist and proposal referee for the National Science Foundation.

X. Paper Presentations

- (1) “Some thoughts on theory dependence and circularity” and “Evaluation of systematic uncertainty in High Energy Physics.” Workshop of the Epistemology of the Large Hadron Collider project, University of Bonn, June 24–26, 2019.
- (2) “What does the evaluation of systematic uncertainty contribute to scientific knowledge?” Colloquium talk given to Department of Physics, Tufts University, April 5, 2019.
- (3) “An Epistemological Function for Systematic Uncertainty in Data to Phenomenon Inferences at the LHC,” Symposium on Model Landscapes and Event Signatures: Using Data to Explore Phenomena Beyond the Standard Model of Elementary Particle Physics, Philosophy of Science Association, Seattle, WA, November 3, 2018.
- (4) “Pragmatism and Methodology in High Energy Physics” and “The Challenges of Measurement Uncertainty,” Particle Physics at the Crossroads Summer School, Epistemology of the Large Hadron Collider project, Wuppertal, Germany, July 24, 2018.
- (5) “Epistemological Functions for Systematic Uncertainty in Measurements in High Energy Physics,” Measurement at the Crossroads Conference, Paris, France, June 28, 2018.
- (6) “The Challenges of Measurement Uncertainty,” Seven Pines Symposium, Stillwater, MN, May 17, 2018.
- (7) “Securing the Empirical Value of Measurement Results,” History and Philosophy of Science and Medicine Series, Washington University, St. Louis, MO, March 6, 2018.

- (8) "Statistics and Uncertainty in High Energy Physics," CERN History Days, Conseil Européen pour la Recherche Nucléaire (CERN) Laboratory, Geneva, Switzerland, February 1, 2018.
- (9) "The Evaluation and Interpretation of Systematic Uncertainty," poster presentation at PSA 2016, the Biennial Meeting of the Philosophy of Science Association, Atlanta, Georgia, November 4, 2016.
- (10) "Securing the Empirical Value of Measurement Results," paper presented at Informal Aspects of Uncertainty Assessment Workshop, Cambridge University, Cambridge, England, May 20, 2016.
- (11) "Estimation of Systematic Uncertainty as Robustness Analysis," paper presented at Workshop on Robustness Analysis, University of Helsinki, Helsinki, Finland, September 25, 2014 and Society for Philosophy of Science in Practice, Aarhus, Denmark, June 24, 2015.
- (12) "Incommensurability as an Epistemic Problem" (with Mike Mazza). Paper presented at Collaborations Conference, Southern Illinois University, Carbondale, Illinois, March 19, 2015
- (13) "The Higgs Boson and Inductive Risk," paper presented at PSA 2014, the Biennial Meeting of the Philosophy of Science Association, Chicago, Illinois, November 8, 2014.
- (14) "The Statistical Philosophy of High Energy Physics: Pragmatism (or, The Higgs Boson and Inductive Risk)," paper presentation at workshop on "Evidence, Discovery, Proof: Measuring the Higgs Particle." Columbia, South Carolina, April 25, 2014.
- (15) "Selection, Significance, and Signification: Issues in High Energy Physics," paper presentation at Boston University Colloquium in Philosophy of Science, "Revisiting the Foundations of Statistics in the Era of Big Data: Scaling Up to Meet the Challenge," February 21, 2014.
- (16) "Five Sigma: Statistics and Standards of Discovery" Colloquium talk given at Johns Hopkins University, Baltimore, Maryland, April 11, 2013 and at conference on "The Epistemology of Data Selection and Analysis Procedures in Physics," Wuppertal, Germany, March 8, 2013.
- (17) "Modeling Possible Theoretical Errors: The Problems of Scope and Stability," paper presentation at "Modeling at the LHC" workshop, Wuppertal, Germany, January 27, 2012.
- (18) "Experimental Knowledge in the Face of Theoretical Error," Discussion paper, "Error in the Sciences" workshop, Lorentz Center, Leiden, Netherlands, October 24–28, 2011.
- (19) "How Hertz Secured Experimental Evidence and What Bayesianism Cannot Do," paper presentation at PSX2 (Second Philosophy of Scientific Experimentation meeting), Konstanz, Germany, October 21–22, 2011 and at SLAPSA3: Meeting of the Saint Louis Area Philosophy of Science Association, February 25, 2012.
- (20) "Justification with Secure Evidence: Possibility before Probability," paper presentation at American Philosophical Association, Pacific Division meeting, San Diego, California, April 21, 2011.
- (21) "Dirac's 'fine-tuning problem': A constructive use of anachronism?" paper presentation at &HPS3 (Third Integrated History and Philosophy of Science meeting), Bloomington, Indiana, September 22, 2010.
- (22) "On an alleged fine-tuning problem in Dirac's electron theory and its partial solution by Weisskopf (and Furry)," paper presentation at HQ3 (History of Quantum Theory 3), Max Planck Institute for the History of Science, July 1, 2010.
- (23) "Securing Evidence through Model Criticism," paper presentation at the Second Meeting of the European Philosophy of Science Association, Amsterdam, October 22, 2009.

- (24) "Internalist and Externalist Aspects of Justification in Scientific Inquiry" (w/ Aaron Cobb), paper presentation at SPSP (Society for Philosophy of Science in Practice), Minneapolis, Minnesota, June 18, 2009.
- (25) "Two Ways to Rule Out Error: Severity and Security," paper presentation at Missouri Philosophy of Science Workshop, September 20, 2008 and at Second Meeting on Philosophy, Probability, and Methodology, Universitat de Valencia, October 31, 2008.
- (26) "Securing Scientific Evidence," paper presentation at University of Frankfurt, May 14, 2008 and at University of Wuppertal, May 27, 2008.
- (27) "Securing Scientific Knowledge." Keynote address at Appalachian Student Philosophy Conference, March 21, 2008.
- (28) "Induction, Hypothesis, and Self-Correction: A Peircean Approach." Colloquium presented at Eastern Tennessee State University, March 22, 2008.
- (29) "Can Error-Statistical Inference Function Securely?" Paper presented at Confirmation, Induction, and Science Conference, London School of Economics, March 9, 2007.
- (30) "Error-statistical Theory Assessment and Alternative Hypothesis Problems: A Role for Plausibility Judgments?" Workshop paper presented at First Symposium on Philosophy, History, and Methodology of Experimental Reasoning, Reliability, Objectivity, and Rationality (ER-ROR), Virginia Tech, June 2, 2006.
- (31) "Probability in Fine-tuning Design Arguments." Paper presented at American Philosophical Association Pacific Division meeting, Portland, Oregon, March 22, 2006.
- (32) "The Evidence for the Top Quark: Disputes and Statistics." Colloquium presented to University of Colorado, Boulder physics department, December 8, 2004.
- (33) "The CDF Collaboration and Argumentation Theory: The Role of Process in Objective Knowledge" (with Bill Rehg). Paper presented at Philosophy of Science Association, Austin, Texas, November 18, 2004.
- (34) "Anti-matter and God: On Fine-tuning and Scientific Inquiry." Colloquium presented to Washington University philosophy department, October 28, 2004.
- (35) "The Pursuit of Experiment by Other Means: The Evolution of An Experimental Research Report in High Energy Physics." Paper presented at the History of Science Society, Cambridge, Massachusetts, November 21, 2003
- (36) "Robustness and Security." Paper presented at Twelfth International Congress of Logic, Methodology and Philosophy of Science," Oviedo, Spain, August 9, 2003
- (37) "Agency and Objectivity in the Search for the Top Quark." Paper presented at Johns Hopkins University Conference on Scientific Evidence, Baltimore, Maryland, April 13, 2003
- (38) "Robustness Reconsidered." Paper presented at Northwest Philosophy Conference, Portland, Oregon, October 26, 2002
- (39) "Demarcation and Severe Testing." Paper presented at the Canadian Society for History and Philosophy of Science, Toronto, Ontario, May 26, 2002
- (40) "What Experiment Did We Just Do? Counterfactual Error Statistics and Uncertainties about the Reference Class." Paper presented at the Seventeenth Biennial Meeting of the Philosophy of Science Association, Vancouver, British Columbia, November 3, 2000
- (41) "Objective Evidence from Subjectively Biased Experimenters: The Uses of Probability Models." Paper presented at the Arkansas Philosophical Association, University of Arkansas, Fayetteville, Arkansas, October 21, 2000

- (42) "Mill on Scientific Method in the System of Logic and On Liberty." Paper presented at HOPOS 2000: Third International History of Philosophy of Science Conference, Vienna, Austria, July 2000
- (43) "Lost Origins of the Third Generation of Quarks." Paper presented at the annual meeting of the History of Science Society, Pittsburgh, Pennsylvania. November, 1999
- (44) "Golden Events and Statistics." Paper presented at the meeting of the Society for the Social Studies of Science, Halifax, Nova Scotia. October, 1998
- (45) "Bayesians, Bias, and Particle Physics." Paper presented at the meeting of the Southern Society for Philosophy and Psychology, New Orleans, Louisiana. April, 1998
- (46) "Novelty, Severity, and History in the Testing of Hypotheses: The Case of the Top Quark." Paper presented at the Fifteenth Biennial Meeting of the Philosophy of Science Association, Cleveland, Ohio, November, 1996

XI. Honors and Grants

- (1) SLU Mellon Faculty Development Grant. Travel grant to present "Estimation of Systematic Uncertainty as Robustness Analysis" at Society for Philosophy of Science in Practice conference, Aarhus, Denmark, June 2015.
- (2) SLU Mellon Faculty Development Grant. Travel grant to present "Experimental Knowledge in the Face of Theoretical Error" at "Error in the Sciences" workshop, Lorentz Center, Leiden, Netherlands, October 2011.
- (3) NSF Research Grant, "The Reach of Experiment: Reasoning Securely About Fundamental Physics," 2008–2010.
- (4) SLU Summer Research Award, "The Reach of Experiment: Reasoning Securely about Fundamental Physics." Summer 2007.
- (5) SLU Mellon Faculty Development Grant. Travel grant to present "Can Error Statistical Inference Function Securely?" at Confirmation, Induction, and Science conference at LSE. March 2007.
- (6) SLU Mellon Faculty Development Grant. "Fine-tuning Problems in Physics and Philosophy." For research on fine-tuning problems in cosmology and fine-tuning arguments in philosophy of religion. Summer 2005.
- (7) SLU Summer Research Award. "New Theories, New Methods: Theoretical and Methodological Innovation in High Energy Physics." For research on the search for new symmetries in physics. Summer 2004.
- (8) SLU Mellon Faculty Development Grant. "In Search of Supersymmetry." For research on history of development of supersymmetric field theories. Summer 2003
- (9) SLU Mellon Faculty Development Grant. "In Search of Supersymmetry." For research on search for supersymmetric particles at Fermi National Accelerator Laboratory. Summer 2002
- (10) NEH Summer Stipend, "Collaborative Experimental Reasoning in High Energy Physics: Historical and Philosophical Perspectives on the Search for the Top Quark" (FT-45784-01). Summer 2001
- (11) Participant, NEH Summer Seminar, "Philosophy of Experimental Inference: Induction, Reliability, and Error." Directed by Deborah Mayo, Virginia Tech. Summer 1999

- (12) Faculty Research Grant, Arkansas State University, Summer 1998. To aid collection of oral history interviews at Fermi National Accelerator Laboratory for use in book project on the search for the top quark
- (13) Grant-in-Aid, American Institute of Physics, 1995–96. For dissertation research at Fermi National Accelerator Laboratory
- (14) Department Fellowship, Department of Philosophy, Johns Hopkins University, 1989–91
- (15) Summer Internship, Fermi National Accelerator Laboratory, Batavia, Illinois. Summers, 1984 and 1985. Assisted in construction and installation of large particle-detection apparatus for scattering experiment
- (16) Muehrcke Scholarship, Grinnell College, 1982–86