

JED ZACHARY BUCHWALD

EDUCATION

INSTITUTION	Degree	Date
Harvard University	Ph.D spvsr. Erwin Hiebert	1974
Harvard University	M.A.	1973
Princeton University	B.A. spvsr. Thomas Kuhn	1971

ELECTED

MacArthur Fellow (1995-2000)
American Philosophical Society, Fellow
Académie Internationale d'Histoires des Sciences, membre effectif
American Association for the Advancement of Science, Fellow
Killam Fellow (Canada, 1990-1991).

ACADEMIC POSITIONS

2001- Doris and Henry Dreyfuss Professor of History, California Institute of Technology
2004 Zeeman Visiting Professor, Dept. of Physics, University of Amsterdam
2019-2023 Director, Caltech-Huntington Institute for the History of Science and Technology
1992-2001: Director, Dibner Institute for the History of Science and Technology, MIT.
1992-2001: Bern Dibner Professor of the History of Science at MIT.
1991-1992: Director, IHPST, University of Toronto.
1974-1992: Lecturer to professor, IHPST, University of Toronto.

[IHPST = Institute for the History and Philosophy of Science and Technology]

CURRENT JOURNALS AND BOOK SERIES, EDITOR OR CO-EDITOR

2020- co-editor with Mordechai Feingold, *Annals of Science* (Taylor and Francis)

2015- (founding) series co-editor with Marjorie Senechal and Gizem Karaali, *Mathematics in Culture and the Arts* (Springer)

2000- (founding) series editor, *Transformations: Studies in the History of Science and Technology* (MIT Press)

1997- editor, *Sources and Studies in the History of Mathematics and Physical Sciences*. (Springer)

1995- co-editor with Jeremy Gray, *Archive for History of Exact Sciences*. (Board member since 1989) (Springer)

1994- (founding) series editor, *Archimedes: New Studies in the History and Philosophy of Science and Technology* (Springer)

CURRENT EDITORIAL BOARDS

1993- editorial board, *Science in Context*
1991- (founding) editorial board, *Perspectives on Science*

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PUBLICATIONS

Books:

6. 2020 (with Diane Greco Josefowicz) **The Riddle of the Rosetta. How an English Polymath and a French Polyglot Discovered the Meaning of Egyptian Hieroglyphs** . Princeton University Press.
5. 2012 (with Mordechai Feingold) **Newton and the Origin of Civilization**. xii+530pp. Princeton University Press.
4. 2010 (with Diane Greco Josefowicz) **The Zodiac of Paris. How an Improbable Controversy over an Ancient Artifact Provoked Modern Debate over Religion and Science**. vi+440 pp. Princeton University Press.
3. 1994 **The Creation of Scientific Effects. Heinrich Hertz and Electric Waves**. xiv+500 pp. The University of Chicago Press. Hardcover and paper.
2. 1989 **The Rise of the Wave Theory of Light. Aspects of Optical Theory and Experiment in the First Third of the Nineteenth Century**. xxiv + 467 pp. The University of Chicago Press. Hardcover and paper.
1. 1985 **From Maxwell to Microphysics. Aspects of Electromagnetic Theory in the Last Quarter of the Nineteenth Century**. xiii + 339 pp. The University of Chicago Press, 1985 in hardcover; 1988 in paper.

Edited and co-edited volumes:

11. 2020 **Einstein Was Right. The Science and History of Gravitational Waves**. Edited. Princeton University Press.
10. 2017 **The Romance of Science. Essays in Honor of Trevor Levere**. Edited. *Archimedes*, vol. 52. Edited with Larry Stewart.
9. 2013 **The Oxford Handbook of the History of Physics**. Edited with Robert Fox. 945 pages.
8. 2012 **A Master of Science History. Essays in Honor of Charles Coulston Gillispie**. Edited. *Archimedes*, vol. 30
7. 2005 **Wrong for the Right Reasons**. Edited, with an introduction, by J.Z. Buchwald and Allan Franklin. *Archimedes*, vol. 11.
6. 2004 "Fisica", Part III of **Storia della Scienza**, vol. VII, pgs. 282-507. Edited by J. Z. Buchwald. *Istituto della Enciclopedia Italiana*.
5. 2001 **Histories of the Electron. The Birth of Microphysics**. Edited, with an introduction, by J. Z. Buchwald and A. Warwick. MIT Press.
4. 2000 **Isaac Newton's Natural Philosophy**. Edited, with an introduction by J. Z. Buchwald and I. Bernard Cohen. MIT Press.
3. 1997 **Aspects of Mid to Late Nineteenth Century Electromagnetism**. Vol. 33 of *Physis*. Edited, with an introduction, by J. Z. Buchwald.
2. 1996 **Scientific Credibility and Technical Standards**, Kluwer. *Archimedes*, vol. 1. Edited, with an introduction, by J. Z. Buchwald.
1. 1995 **Scientific Practice: Theories and Stories of Physics**. Edited by J. Z. Buchwald. The University of Chicago Press.

Articles:

79. 2023 "Gauging potentials: Maxwell, Lorenz, Lorentz and others on linking the electric scalar and vector potentials", in *The Richness of the History of Mathematics*, ed. Chemla, Ferreiros, Ji, Scholz, Wang, vol. 66, pp. 341-364.
78. 2023 "Descartes' experimental journey past the prism and through the invisible world to the rainbow", in *Collected Wisdom of the Early Modern Scholar*, ed. G. Manning and A. M. Roos, *Archimedes*, vol. 64, pp. 193-227.
77. 2022 (with Anthony Grafton), "Noel Swerdlow", *Isis*, 11/22

76. 2020 (with C-P Yeang et al.) "What Heinrich Hertz Discovered about electric waves in 1887-1888," *Archive for History of Exact Sciences*.
75. 2016 (with C-P Yeang) "Kirchhoff's theory for optical diffraction, its predecessor and subsequent development: the resilience of an inconsistent theory," *Archive for History of Exact Sciences*, 70, pp. 463-511.
74. 2016 "Politics, morality, innovation, and misrepresentation in physical science and technology," *Physics in Perspective*, 18, pp. 283-300.
73. 2016 "Thomas Kuhn", **Shifting Paradigms: Thomas S. Kuhn and the History of Science**, eds. Blum, Gavroglu, Joas and Renn, Max Planck Research Library for the History and Development of Knowledge, Proceedings 8, pp.151-162.
72. 2016 "Descartes on the Rainbow", **The Cambridge Descartes Lexicon**, ed. L. Nolan, **Cambridge**, pp. 627-633.
71. 2013 "Electrodynamics from Thomson and Maxwell to Hertz," in **The Oxford Handbook of the History of Physics**, pp. 571-583.
70. 2013 "Optics in the Nineteenth Century," in **The Oxford Handbook of the History of Physics**, pp. 445-472.
69. 2013 "Electricity and Magnetism to Volta," in **The Oxford Handbook of the History of Physics**, pp.432-444.
68. 2013 (with Robert Fox) Introduction. **The Oxford Handbook of the History of Physics**, pp. 1-7.
67. 2012 "Kuhn's *Structure* Four and a Half Decades Later," *Historical Studies in the Natural Sciences*, 42:485-90.
66. 2012 (with Diane Greco Josefowicz) "The cipher of the zodiac, review symposium response," *Metascience*, 21.
65. 2012 "Cauchy's theory of dispersion anticipated by Fresnel," in **A Master of Science History**, *Archimedes*, 30: 399-416.
64. 2011 (with Diana Kormos Buchwald) "Martin J. Klein, 1924-2009," *Biographical Memoirs of the National Academy of Sciences*, 1-16.
63. 2010 "A reminiscence of Thomas Kuhn," *Perspectives on Science*, 18:279-83.
62. 2009 (with D. Graham Burnett) "Michael S. Mahoney, 1939-2008," *Isis* 100:623-6. Reprinted in M. S. Mahoney, **Histories of Computing**, Harvard University Press, 2010.
61. 2007 "Descartes' Experimental Journey Past the Prism and Through the Invisible World to the Rainbow", *Annals of Science*, 65:1-46.
60. 2007 "Discrepant Measurements and Experimental Knowledge in the Early Modern Era", *Archive for History of Exact Sciences*, 61:1-85.
59. 2006 "Huygens' Experimental Determination of the Optical Parameters in Iceland Spar", *Archive for History of Exact Sciences*, 60:67-81.
58. 2005 "An error within a mistake?", in **Wrong for the Right Reasons**, *Archimedes*, vol. 11, ed. Buchwald and Franklin, Kluwer, 2005, pgs. 185-208.
57. 2005 Introduction (with A. Franklin) to **Wrong for the Right Reasons**, *Archimedes*, vol. 11, ed. Buchwald and Franklin, Kluwer, 2005, pgs. 1-16.
56. 2004 "Afterword: F. L. Holmes and the History of Science", pgs, 193-202 in F. L. Holmes, **Investigative Pathways, Patterns and Stages in the Careers of Experimental Scientists**, New Haven: Yale University Press.
55. 2004 "Egyptian Stars Under Paris Skies", *Engineering & Science*, 66: 20-31.
54. 2004 "Raggi e ondi luminosi", chap. 34, Part III, vol. VII, pgs. 342-357 of **Storia della Scienza**, *Istituto della Enciclopedia Italiana*.
53. 2004 "L'elettromagnetismo e il campo", chap. 39, Part III, vol. VII, pgs. 405-426 of **Storia della Scienza**, *Istituto della Enciclopedia Italiana*.
52. 2003 "Physics: Its methods, practitioners, boundaries", co-authored with Sungook Hong, chap. 6 (pgs. 163-195) in **From Natural Philosophy to the Sciences: Historiographical Essays on Nineteenth-Century Science**, ed. David Cahan, The University of Chicago Press.
51. 2003 "Sadi Carnot and Augustin Jean Fresnel" in **The Oxford Companion to the History of Modern Science**, ed. John Heilbron, Oxford University Press.

50. 2003 "The Scholar's Seeing Eye", pgs. 309-25 in **Reworking the Bench: Research Notebooks in the History of Science**, ed. Jürgen Renn, Larry Holmes, Hans-Joerg Rheinberger (*Archimedes*, vol. 7) Kluwer:Dordrecht.
49. 2002 (with George E. Smith) "Incommensurability and the discontinuity of evidence", *Perspectives on Science*, 9:463-98.
48. 2002 "Comment Maxwell finit par triompher", *Les Cahiers de Science et Vie*, 67:86-96.
47. 2001 "Notas sobre conocimiento inarticulado, experimentacion y traduccion", *Theoria*, 17:243-63.
46. 2001 "A potential disagreement between Helmholtz and Hertz", *Archive for History of Exact Sciences*, 55:365-93.
45. 2000 "Reply to Mattingly", **Stud. Hist. Phil. Mod. Phys.**, 32:1-3.
44. 2000 "How the ether spawned the micro-world", pgs. 203-225 in **Biographies of Scientific Objects**, ed. Lorraine Daston. Chicago: the University of Chicago Press.
43. 1999 with Kostas Gavroglu, *Preface* to vol. 2 of *Archimedes, The Sciences in the European Periphery During the Enlightenment*, pgs. 7-11.
42. 1998 "Issues for the history of experimentation", pgs. 374-91 in **Experimental Essays – Versuche zum Experiment**, eds. M. Heidleberger and F. Steinle, Nomos Verlagsgesellschaft, Baden-Baden.
41. 1998 "Reflections on Hertz and the Hertzian dipole", in D. Baird et al. (eds.), **Heinrich Hertz: Classical Physicist, Modern Philosopher**, pp. 269-80.
40. 1998 (with George E. Smith) "Thomas S. Kuhn, 1922-1996", *Philosophy of Science*, 64:361-76.
39. 1997 Introduction to **Aspects of Mid to Late Nineteenth Century Electromagnetism**, *Physis*, vol. 33.
38. 1996 "Mathematics in 19th century physics", *Journal of the Center for Applied Computing*, Holland
37. 1996 Introduction to **Scientific Credibility and Technical Standards**, vol. 1 of *Archimedes*, pp.vii-ix.
36. 1995 "Why Hertz was right about cathode rays". In **Scientific Practice**, ed. J. Z. Buchwald, pp. 151-169.
35. 1995 "The practice of physics", with Sam Schweber. Concluding essay to **Scientific Practice**, ed. J. Z. Buchwald, pp. 345-352.
34. 1995 (with Tom Archibald) "Heinrich Hertz. La Scoperta delle onde elettriche", in **Cento Anni di Radio. Le Radici dell'Invenzione**, Torino:Edizioni Seat, pp. 123-174.
33. 1995 "Ottica, stòria dell': dal 1800 ai primi del novecento", **Enciclopaedia Italiana delle Scienze**, pp.419-425.
32. 1995 "Heinrich Hertz's attempt to generate a novel account of evaporation", **No Truth Except in the Details**, ed. A. J. Kox and D. M. Siegel, Amsterdam:Kluwer.
31. 1994 "How Hertz fabricated Helmholtzian forces in his Karlsruhe laboratory", **Universalgenie Helmholtz**, ed. Lorenz Kruger, pp. 43-65. Berlin: Akademie Verlag.
30. 1994 "Elettricità", **Enciclopaedia Italiana delle Scienze**, pp. 259-269.
29. 1994 (contributing editor for mechanics) **The Collected Papers of Albert Einstein**, vol. 3. Princeton: Princeton University Press.
28. 1994 "Kinds and (In)commensurability", **Trends in the Historiography of Science**, pp. 49-63.Kluwer:the Netherlands.
27. 1993 "Waves, philosophers and historians", *PSA*, 2:205-211.
26. 1993 "Helmholtz's electrodynamics in context: object states, laboratory practice and anti-Idealism." **Hermann von Helmholtz and the Foundations of Nineteenth-Century Science**, pgs. 334-373. Ed. D. Cahan. University of California Press.
25. 1993 "Campo, storia del concetto di,", **Enciclopaedia Italiana delle Scienze**, pgs. 483-492.
24. 1992 "Design for Experimenting". **World Changes. Thomas Kuhn and the Nature of Science**, pgs. 169-206. Ed. Paul Horwich. MIT.

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23. 1992 "Kinds and the Wave Theory of Light". *Studies in the History and Philosophy of Science*, 23:39-74.
22. 1992 "The training of German research physicist Heinrich Hertz" in **The Invention of Physical Science**. Edited by J. Richards, M. J. Nye, and R. Stuewer. Kluwer.
21. 1992 "Why Stokes *never* wrote a treatise on optics". **The Investigation of Difficult Things**. Edited by Alan Shapiro and Peter Harman. Cambridge University Press.
20. 1992 Introduction (co-authored with Kurt Pedersen) to a translation by T. Archibald of *Erasmus Bartholin's Experimenta*. Royal Copenhagen Library.
19. 1990 "The background to Heinrich Hertz's experiments in electrodynamics". In **Nature, Experiment, and the Sciences**, eds. T. H. Levere and W. R. Shea, Dordrecht:Kluwer, pgs. 275-306.
18. 1989 "The battle between Arago and Biot over Fresnel". *Journal of Optics/Nouvelle Revue d'Optique*, 20, 109-117.
17. 1989 "The Invention of Polarization". In **New Trends in the History of Science**, Dordrecht.
16. 1989 "The Michelson Experiment and Electrodynamics circa 1900." In **The Michelson Era in American Science 1870-1930**. Eds. S. Goldberg & R. H. Stuewer. New York: AIP Conference Proceedings 179, 55-70.
15. 1985 "Oliver Heaviside: Maxwell's Apostle and Maxwellian Apostate", *Centaurus* 28, 288-330.
14. 1985 "Modifying the Continuum: methods of Maxwellian electrodynamics". In **Wranglers and Physicists**. Manchester: Manchester University Press, 225-41.
13. 1983 "Fresnel and Diffraction Theory", *Archives internationales d'histoire des sciences* 33, 36-111.
12. 1981 "The Quantitative Ether in the First Half of the Nineteenth Century". In **Conceptions of Ether**, ed. G. Cantor and M.J.S. Hodge. Cambridge: 215-37.
11. 1981 "The Abandonment of Maxwellian Electrodynamics: Joseph Larmor's Theory of the Electron", *Archives internationales d'histoire des sciences* 31: 135-180 and 373-438.
10. 1980 "Optics and the Theory of the Punctiform Ether", *Archive for History of Exact Sciences* 21, 245-78.
9. 1980 "Experimental Investigations of Double Refraction from Huygens to Malus", *Archive for History of Exact Sciences* 21, 311-73.
8. 1979 "The Hall Effect and Maxwellian Electrodynamics in the 1880's: The Discovery of a New Electric Field", *Centaurus* 23, 51-99.
7. 1979 "The Hall Effect and Maxwellian Electrodynamics in the 1880's: The Unification of Theory, 1881-1893", *Centaurus* 23, 131-75.
6. 1977 "William Thomson and the Mathematization of Faraday's Electrostatics", *Historical Studies in the Physical Sciences* 8, 101-36.
5. "Emilio Villari", **Dictionary of Scientific Biography**, 14: 32-3, ed. C. C. Gillispie et al. (New York).
4. "Leopoldo Nobili", **Dictionary of Scientific Biography**, 10: 134-6, ed. C. C. Gillispie et al. (New York).
3. "Macedonio Melloni", **Dictionary of Scientific Biography**, 9:264-5, ed. C. C. Gillispie et al. (New York).
2. "Ottaviano Fabrizio Mossotti", **Dictionary of Scientific Biography**, 9:547-9, ed. C. C. Gillispie et al. (New York).
1. "Sir William Thomson (Lord Kelvin)", **Dictionary of Scientific Biography**, 13: 374-88, ed. C. C. Gillispie et al. (New York).

CURRENT RESEARCH PROJECTS:

Monograph (with Mordechai Feingold) **Isaac Newton's Route to Universal Gravitation: A New Biography of the Man and his Theory**. Estimated completion 2025-2026.

Monograph (with Chen-Pang Yeang) **How Electric Waves Became Real**. Estimated completion 2026-2027.