

Massimiliano Badino

PROFESSIONAL PROFILE

I am an historian and philosopher of science striving to reach the innermost essence of the conceptual, social, and cultural development of mathematical physics from Newton to the present. Or at least a decent cup of tea.

CONTACT

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University of Verona
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EDUCATION

University of Genoa

MAR 2000 - MAY 2004

PhD in Philosophy of Science

- Supervisor: Evandro Agazzi
- Dissertation title: I due problemi fondamentali della meccanica statistica
- Qualification: with honors

University of Genoa

Nov 1993 - Dec 1998

MA in Philosophy

- Supervisor: Evandro Agazzi
- Dissertation title: L'epistemologia di Planck nel suo contesto storico
- Qualification: with honors and right to be published

WORK EXPERIENCE

University of Verona

FEB 2018 - PRESENT

Assistant Professor

- Department of Human Sciences
- Teaching and Research Position
- AOC: Logic, Philosophy of Science, Epistemology
- AOS: History and Philosophy of Science

Universitat Autònoma de Barcelona - Massachusetts Institute of Technology

Nov 2014 - Oct 2017

Marie Skłodowska-Curie Fellow

- Research position
- Mentors: David Kaiser and Agustí Nieto-Galan
- Project management responsibility

Universitat Autònoma de Barcelona

JUL 2012 - JUN 2014

Post-Doctoral Research Fellow

- Research position
- Organizational responsibility

Max Planck Institute for the History of Science

DEC 2011 - JUN 2012

Post-Doctoral Research Fellow

- Research position

Fritz Haber Institute of the Max Planck

JAN 2010 - NOV 2011

Society

Post-Doctoral Research Fellow

- Research position
- Cooperation with working scientists

Max Planck Institute for the History of Science

JAN 2007 - DEC 2009

Post-Doctoral Research Fellow

- Research position
- Mentor: Jürgen Renn

Max Planck Institute for the History of Science

JUN 2005 - DEC 2006

Visiting Scholar

- Visiting position

LANGUAGES

Italian (Native proficiency), **English** (Full professional proficiency), **German** (Professional working proficiency), **Spanish** (Limited working proficiency), **Catalan** (Limited working proficiency), **French** (Elementary proficiency)

TEACHING

Logic (M-Fil/02)

FEB 26, 2018 - APR 21, 2018

University of Verona

- Bachelor Course (Philosophy)
- Description, ILO, and Syllabus can be downloaded [here](#)

Foundations of Logic (L-Fil-Let/12)

FEB 26, 2018 - APR 7, 2018

University of Verona

- Bachelor Course (Educational Sciences)
- Description, ILO, and Syllabus can be downloaded [here](#)

Kaufman Teaching Certificate

JUN 2015

Massachusetts Institute of Technology

Teaching program consisting of a series of dedicated workshops oriented to improve and enlarge teaching skills at university level:

- Introduction to Research on How People Learn
- Designing a Course and Constructing a Syllabus
- Constructing Effective Problem Sets and Exam Questions
- Planning and Facilitating a Class Session
- Interactive Teaching and Active Learning
- Teaching Inclusively
- Enhancing Learning with Educational Technology Developing a Teaching
- Writing a Teaching Philosophy Statement

Research and Pedagogy: Textbooks and the History of Quantum Physics (FISC27)

AUG 2014

Universidade Federal da Bahia

- PhD Course
- Programa de Pós-Graduação em Ensino Filosofia e História das Ciências

Theories of Scientific Explanation (M-FIL/02)

APR 2011

University of Genoa

- Seminar BA Course
- Philosophy of Science

Methodology of Science and Technology Studies (M-FIL/02)

MAR 2009

University of Genoa

- Seminar MA Course
- Philosophy of Science
- Sociology of Science
- Cultural Studies of Science

PHD SUPERVISION

Candidate: Leyla Mariane Joaquim

29 Aug 2014

Universidade Federal da Bahia

- Dissertation title: *Disciplinary Encounters. When Physics Meets Biology: Some Historical and Contemporary Perspective.*
- Result: with honors.

PROFESSIONAL SERVICES

Journal Boards Memberships

- Advisory Editor of *Isis* (2015-2017).
- Scientific Board Member of *Organon*.

Publisher Boards Memberships

- Co-Editor of the series *History of Modern Science*, Brill.
- Co-Editor of the series *Edition Open Sources*, EOA, Berlin.
- Scientific Board Member of the series *Studies and Sources in Political Epistemology*, Edizioni Ca' Foscari, Venice.
- Editor of the series *Meccanismi*, Edizioni Melquiades, Milan.

Manuscripts Refereeing

- *Epistemologia*
- *Physis*
- *Isis*
- *Journal of Philosophy*
- *Foundations of Physics – Letters*
- *Studies in History and Philosophy of Modern Physics*
- *European Physical Journal H*
- *Physics Today*
- *European Journal for Philosophy of Science*
- *Historical Studies in the Natural Sciences*
- *European Journal of Physics*
- *Foundations of Science*
- *British Journal for the History of Science*
- *Archive of History of Exact Sciences*
- *Theoria*
- *Physics in Perspective.*

Book Submissions Refereeing

- Boston Studies in Philosophy of Science
- Oxford University Press
- University of Pittsburgh Press

Research Projects Refereeing

- Expert reviewer of international research proposals for the National Center of Science and Technology Evaluation, Kazakhstan.
- Member of the selection committee of special issues of *Centaurus*.

Symposia Organized

- *Mathematical Laboratory / Paper Physics: Concepts, Pedagogy, and Methods of Mathematical Physics*, HSS annual meeting, Chicago, IL, November 6-9, 2014.
- *Circulating Theoretical Physics: Scientific Exchanges between Europe, US, and Latin America*, Three Societies Meeting, Philadelphia, July, 11-14, 2012.
- *Crossing Borders in Quantum Physics*, 4th Conference of the European Society for the History of Science, Barcelona, November 18-20, 2010.
- *Research and Pedagogy. A History of Quantum Physics through its Textbooks I and II* (with Jaume Navarro), HSS annual meeting, Phoenix, AZ November 19-21, 2009.

Conferences Organized

- *Joint 3rd International Conference on the History of Physics under the auspices of the European Physical Society and 4th Early-Career Conference for Historians in the Physical Sciences of the American Institute of Physics*, San Sebastian, October 17-21, 2018.
- *Science as Cultural Hegemony – Gramscian Concepts for the History of Science*, Barcelona, January 21-23, 2014.
- *History of Quantum Physics (HQ3)*, Berlin June 28-July 2, 2010.

SOCIETY MEMBERSHIPS

- European Society of the History of Science
- Società italiana di logica e filosofia della scienza

HONORS AND GRANTS

Research Professorship DEC 2016 Ikerbasque Foundation

Position cancelled for administrative reasons

Marie Skłodowska-Curie International DEC 2013 Outgoing Fellowship

Marie Skłodowska-Curie Actions

Evaluation: 98/100

Award for Dissertations in History of Physics APR 1999 Accademia Nazionale delle Scienze detta dei XL

OUTREACH

Articles

- M. Badino, 2005, "L'Universo: finito, infinito o...?", *KOS*, 3, 50-55.
- M. Badino, 2003, "Verso una teoria del tutto?", *Golem L'Indispensabile*, 3, Federico Motta Editore.

Web

- Personal blog <https://ihavetoadmitblog.wordpress.com/>
- Personal blog <http://massimilianobadino.com/captains-log/>

Other Initiatives

- I am collaborating with the publisher Castelvecchi to produce a series of collections of writings of Max Planck for a broad audience
- Popular lectures at the Genoa Science Festival.

RESEARCH PROJECTS

Science, Cultural Hegemony, and Civil Society: 2014 - PRESENT Gramscian Concepts for the History of Science

- Description: International Project of the UAB and the Max Planck Institute for the History of Science
- Funded: Max Planck Institute for the History of Science and CEHIC
- Position: Principal Investigator (with Pietro D. Omodeo)
- Details [here](#)

Order/Chaos: Genealogy of Two Concepts in Nov 2014 - Oct 2017 the Culture of European Mathematical Physics

- Description: International Outgoing Fellowship at UAB and MIT
- Funded: Marie Skłodowska-Curie Actions Grant no. PEOF-GA-2013-623536
- Position: Principal Investigator
- Details [here](#)

Probability in Quantum and Statistical 2011 - 2014 Mechanics

- Description: German-Israeli collaboration between the Max Planck Institute for the History of Science, the Department of Philosophy of Jerusalem, and the Department of Philosophy of Haifa
- Funded: German-Israeli Foundation, Grant no. I-1054-112.4/2009

- Position: Research Associate
- Details [here](#)

Research and Pedagogy: A History of Quantum Physics Through its Textbooks

2009 - 2013

- Description: International Project of a network of European and American Universities
- Funded: Max Planck Society
- Position: Principal Investigator (with Jaume Navarro)
- Details [here](#)

History and Foundations of Quantum Physics

2006 - 2012

- Description: International Project of a network of European and American Universities
- Funded: Strategic Funds of the President of the Max Planck Society
- Position: Research Associate
- Details [here](#)

RESEARCH INTERESTS

- History and philosophy of modern physics, in particular quantum theory, classical mechanics, statistical mechanics, celestial mechanics, chaos theory
- Scientific realism
- Concept dynamics and theory change
- History and philosophy of scientific practices
- Political epistemology
- Theories of scientific explanation
- Order and chaos in mechanics from the Enlightenment

ERC Sectors: SH4-13; SH3-13; SH6-13

JOURNAL ARTICLES

- M. Badino, 2018, "The Discreet Charm of Ontology", *Isis*, **109** (1) 102-105.
- M. Badino, 2018, "And Yet It Stands: The Stability of the Solar System in Eighteenth Century Physical Astronomy", *Historical Studies in the Physical Sciences*, **48** (2) 123-179.
- M. Badino, 2017, "Using, Abusing, and Perusing the Past", *Isis*, **108** (4) 836-840.
- M. Badino, 2017, "What Have Historians of Quantum Physics Ever Done for Us?", *Centaurus*, **58** (4) 327-346.
- M. Badino, 2016, "La strana storia della termodinamica relativistica", *Giornale di Astronomia*, **42** (4) 12-17.
- M. Badino, 2014 "Bridging Conceptual Gaps: The Kolmogorov-Sinai Entropy", *Isonomia*, April.
- M. Badino and B. Friedrich, 2013, "Much Polyphony but Little Harmony: Otto Sackur's Early Take on the Quantum Theory of Gases", *Physics in Perspective*, **15** (3) 295-319.
- M. Badino, 2012, "Productive Conservatism: Planck's Second Theory of Radiation", *Annalen der Physik*, **524** (2) A29-A31.
- M. Badino, 2011, "Mechanistic Slumber vs. Statistical Insomnia: The Early Phase of Boltzmann's H-theorem (1868-1877)", *European Physical Journal - H*, **36** (3) 353-378.
- M. Badino, 2009, "The Odd Couple: Boltzmann, Planck and the Application of Statistics to Physics (1900-1913)", *Annalen der Physik*, **18** (2-3) 81-101.
- M. Badino, 2006, "Pensare l'incerto: la concezione suppesiana della probabilità fra invarianza e pluralismo", *Epistemologia*, **29**, 291-322.
- M. Badino, 2006, "The Foundational Role of Ergodic Theory", *Foundations of Science*, **11**, 4, 323-347.
- M. Badino, 2005, "Il contributo di Khinchin al problema ergodico", *Physis*, **42**, 2, 481-499.
- M. Badino, 2004, "An Application of Information Theory to the Problem of Scientific Experiment", *Synthese*, **140** (3) 355-389.
- M. Badino and N. Robotti, 2001, "Max Planck and the Constants of Nature", *Annals of Science*, **58**, 137-162.
- M. Badino, 2001, "La relazione fra filosofia e storia della scienza e il caso di Max Planck", *Epistemologia*, **24**, 301-338.

BOOK CHAPTERS

- M. Badino, 2018, "Max Planck e la pratica della fisica", in M. Badino (ed.) *Max Planck: L'immagine della scienza. Saggi sulla fisica moderna* (Rome: Castelvecchi), 5-18.
- M. Badino, 2018, "How Typical: The Structure of the Typicality Explanation", in V. Allori (ed.) *Statistical Mechanics and Scientific Explanation: Determinism, Indeterminism and Laws of Nature* (Singapore: World Scientific Publishing), forthcoming.
- M. Badino and J. Navarro, 2018, "Ether: The Many Lives of a Resilient Concept", in J. Navarro (ed.) *Ether and Modernity*, (Oxford: Oxford University Press), forthcoming in September.
- M. Badino, 2016, "How to Make Selective Realism More Selective (and More Realist Too)", in *PSA2016, 25th Biennial Meeting of the Philosophy of Science Association - Conference Volume*, 13-33.
- M. Badino, 2016, "Typicality in Statistical Mechanics: An Epistemological Approach", in L. Felline, A. Ledda, F. Paoli, E. Rossanese (eds.), *New Directions in Logic and the Philosophy of Science*, (London: College Publications), 233-243.
- M. Badino, 2014, "The strange equation of Dr. Sackur and Mr. Tetrode", in E.R.A.C. Giannetto, S. Ricciardo, E. Antonello, M. Mazzoni (eds.), *Cielo Terra. Fisica e Astronomia un antico legame*, (Rome: Aracne), 191-197.
- M. Badino, 2013, "Lottando contro la corrente del tempo. Un lettura delle *Lezioni sulla teoria dei gas*" in *Ludwig Boltzmann: Lezioni sulla teoria del gas*, (Milan: Edizioni Melquiades), 11-49.
- M. Badino and J. Navarro, 2013, "Pedagogy and Research. Notes for a Historical Epistemology of Science Education", in M. Badino, J. Navarro (eds.), *Research and Pedagogy: A History of Quantum Physics through its Textbooks*, (Berlin: Edition Open Access), 7-30.
- M. Badino, 2013, "Dissolving the Boundaries between Research and Pedagogy: Otto Sackur's Lehrbuch der Thermochemie und Thermodynamik", in M. Badino, J. Navarro (eds.), *Research and Pedagogy: A History of Quantum Physics through its Textbooks*, (Berlin: Edition Open Access), 103-127.
- M. Badino and B. Friedrich, 2013, "Putting the Quantum to Work: Otto Sackur's Pioneering Exploits in the Quantum Theory of Gases", in S. Katzir, C. Lehner, J. Renn (eds.), *Traditions and Transformations in the History of Quantum Physics*, (Berlin: Edition Open Access), 61-85.
- M. Badino, 2010, "Das Verfolgen einer Idee: Plancks Theorie idealer Gase", in D. Hoffmann (ed.), *Max Planck und die moderne Physik*, (Berlin: Springer), 135-148.
- M. Badino, 2008, Postscript to the entry "Ludwig Boltzmann", *New Dictionary of Scientific Biographies*, 28 vols., (Detroit: Charles Scribner's Sons), vol. 1, 337-339.
- M. Badino and N. Robotti, 2000, "The Search for Universal Constants and the Birth of Quantum Mechanics", in C. Garola, A. Rossi (eds.), *Foundations of Quantum Mechanics: Historical Analysis and Open Questions*, (Singapore: World Scientific Publishing), 343-353.
- M. Badino and N. Robotti, 1998, "L'origine della costante h", *Proceedings of XVIII Congresso Nazionale di Storia*

EDITED BOOKS

- M. Badino (ed.), 2018, *Max Planck, L'immagine della scienza: Saggi sulla fisica moderna*, (Rome: Castelvecchi).
- M. Badino and P. D. Omodeo (eds.), 2018, *Cultural Hegemony in a Scientific World: Gramscian Concepts for the History of Science* (Amsterdam: Brill), forthcoming.
- M. Badino and J. Navarro (eds.), 2013, *Research and Pedagogy: A History of Quantum Physics through its Textbooks* (Berlin: Edition Open Access).

BOOKS

- M. Badino, 2015, *The Bumpy Road: Max Planck from Radiation Theory to the Quantum (1896-1906)* (New York: Springer).
- M. Badino, 2010, *Il professore e il suo demone. La lunga lotta di Max Planck contro la statistica* (Milan: Edizioni Melquiades).
- M. Badino, 2000, *L'epistemologia di Planck nel suo contesto storico* (Naples: Edizioni Scientifiche Italiane).

TRANSLATIONS

- Ludwig Boltzmann, *Lezioni sulla teoria dei gas* (translation and editing of Boltzmann's *Vorlesungen über Gastheorie*) (Milan: Edizioni Melquiades, 2013).
- James Clerk Maxwell, *Trattato elementare di elettricità*, (translation from English of Maxwell's *An Elementary Treatise on Electricity*) (Milan: Edizioni Melquiades, 2010).
- Ludwig Boltzmann, *Fisica e probabilità*, (Boltzmann's papers of 1872 and 1877 translated from German with introduction, notes and mathematical appendixes) (Milan: Edizioni Melquiades, 2005).

BOOKS REVIEWS

- M. Badino, 2016, "John Heilbron, *Physics: A Short History from Quintessence to Quarks*", *British Journal for the History of Science*, **49**, 3, 474-476.
- M. Badino, 2015, "Albert Einstein. *The Collected Papers of Albert Einstein Volume 12: The Berlin Years: Correspondence, January-December 1921; Volume 13: The Berlin Years: Writings & Correspondence, January 1922-March 1923*", *Isis*, **106**, 1, 209-211.
- M. Badino, 2007, "Frederich Steinle, *Explorative Experimente. Ampere, Faraday und die Ursprünge der Elektrodynamik*", *Isis*, **98**, 4, 857-858.

LECTURES (INVITED)

- "An Unintentional Consequence: The Quantum in the Framework of the 19th Century Physics", American Physical Society Spring Meeting, Los Angeles, March 6, 2018.
- "From Here to Eternity: Culture, Mathematical Practices, and the Emergence of Order in 18th Century Celestial Mechanics", Stevin Center for the History of Science and Humanities, March 22, 2017.
- "And Yet It Stays: The Stability of the Solar System in 18th Century Physical Astronomy", Harvard PhunDay, Cambridge, MA, October 29, 2016.
- "What Have the Historians of Quantum Physics Ever Done for Us?", Keynote Lecture, European Society for the History of Science Meeting, Prague, September 23, 2016.
- "The T-word: Reflections on the Historiography of Theories", Inter-University Center Annual Meeting, Dubrovnik, April 13-17, 2015.
- "Research and Pedagogy: Textbooks and the History of Quantum Physics", Universidade Federal da Bahia, August 2014.
- "How Theories Begin: Max Planck and the Genesis of Quantum Theory", Lectio Commandiniana, Urbino, April 23, 2013.
- "L'entropia di Kolmogorov-Sinai e le sue conseguenze per il caos e la teoria dell'informazione", XV Summer School in Philosophy of Physics, Cesena, September 19-24, 2012.
- "Pursuing an Idea: Planck's Quantum Theory of Ideal Gas", Planck-Symposium auf der Frühjahrtagung der Deutsche Physikalische Gesellschaft, Berlin, February 28, 2008.
- "Il corifeo della fisica classica. L'avventura scientifica di Ludwig Boltzmann", The Revolution in Microphysics: 100 years of the death of Ludwig Boltzmann, Florence, September 5, 2006.

TALKS

- "Schooling the Quantum Generations: Textbooks and Quantum Cultures from 1900 to the 1930s", 25th International Congress of History of Science, Technology, and Medicine, Rio de Janeiro, July 29, 2017.
- "Realism, Continuity, and the Historiography of Science", Triennial Conference of the Italian Society of Logic and Philosophy of Science (SILFS), Bologna, 22 June 2017.
- "How to Make Selective Realism More Selective (and More Realist Too)", Philosophy of Science Association Biannual Meeting, Atlanta November 4, 2016.

"How Lagrange Saved the Universe. The Forgotten Narrative on the Stability of the Solar System", European Society for the History of Science Meeting, Prague, September 22, 2016.

"How to Make Selective Realism More Selective (and More Realist Too)", 6th Meeting of Integrated History and Philosophy of Science (&HPS6), Edinburgh, July 4, 2016.

"Stability and Scientific Realism: The Coming of Age of Perturbation Theory", 6th Meeting of the Society for the Philosophy of Science in Practice, Glassboro, NJ, June 17, 2016.

"If You Can Calculate It, Then It's Real: The Coming of Age of Perturbation Theory", The History of Science and Contemporary Scientific Realism", Indianapolis, February 20, 2016.

"How Typical! An Epistemological Analysis of Typicality in Statistical Mechanics", 15th Congress of Logic, Methodology and Philosophy of Science, Helsinki, August 5, 2015.

"Hegemony and History of Science", Past and Present. Philosophy, Politics, and History in the Thought of Gramsci, London, June 18-19, 2015 (with Pietro D. Omodeo).

"Boltzmann in Oxford: How Mathematics Molds Physical Concepts", HSS, Annual Meeting, Chicago, IL, November 6-9, 2014.

"How Typical: Genealogy of a Concept", Triennial Conference of the Italian Society of Logic and Philosophy of Science, Rome, June 18-20, 2014.

"How Typical: Genealogy of a Concept", 24th International Congress of History of Science, Technology and Medicine, Manchester, July 21-28, 2013.

"A Tale of Two Problems or How US Joined Together What Europe Had Put Asunder", 5th Conference of the European Society for the History of Science, Athens, November 1-3, 2012.

"A Tale of Two Problems or How US Joined Together What Europe Had Put Asunder", Three Societies Meeting, Philadelphia, PA, July 11-14, 2012.

"How Theories Begin: Max Planck and the Genesis of Quantum Theory", 4th Meeting of Integrated History and Philosophy of Science (&HPS4), Athens, March 15-18, 2012.

"A Bridge over Trouble Waters: Max Planck's Use of Abstract Spaces", HSS Annual Meeting, Cleveland, OH, November 3-6, 2011.

"Pedagogy and Research. Notes for a Historical Epistemology of Science Educations", 11th International IHPST Conference, Thessaloniki, 1-5 July 2011 (with Jaume Navarro).

"How Theories Begin: Max Planck and the Genesis of Quantum Theory", Continuity and Discontinuity in the Physical Sciences since the Enlightenment, College Park, MD, 28-31 July 2011.

"Across the Disciplinary Divide: Otto Sackur from Physical Chemistry to Quantum Physics and Back", 4th Conference of the European Society for the History of Science, Barcelona 18-20 November 2010.

"Research and Pedagogy: A History of Quantum Physics Through the Textbooks", History of Quantum Physics (HQ3), Berlin, 28 June - 2 July 2010 (with Jaume Navarro).

"Putting the Quantum to Work: Otto Sackur's Pioneering Exploits in the Quantum Theory of Gases", History of Quantum Physics (HQ3), Berlin, 28 June - 2 July 2010 (with Bretislav Friedrich).

"Against the Wind: Otto Sackur and his Daring Lehrbuch der Thermodynamik und Thermochemie", HSS Annual Meeting, Phoenix, AZ, November 19-21, 2009.

"La strana equazione del dr. Sackur e di mr. Tetrode", XXIX Congresso Nazionale di Storia della Fisica e dell'Astronomia, Arcetri, September 16-18, 2009.

"Converging Differences: The Debate on the Quantum Theory of Ideal Gas", History of Quantum Physics (HQ2), Utrecht, July 14-17, 2008.

"A Quantum Melting Pot: The Origin of the Quantum Theory of Ideal Gas", Three Societies Meeting, Oxford, July 4-6, 2008.

"I solidi ignoti: Ascesa e declino dell'Eigenschwingungen Methode", XXVIII Congresso Nazionale di Storia della Fisica e dell'Astronomia, Bergamo, June 25-28, 2008.

"The Odd Couple: Boltzmann, Planck and the Application of Statistics to Physics (1900-1913)", History of Quantum Physics (HQ1), Berlin, July 2-6, 2007.
