

Curriculum Vitae

Matteo LEONE

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CURRENT AND PAST POSITIONS

Associate Professor of Didactics and History of Physics (FIS/08)

Department of Philosophy and Educational Sciences, University of Turin, 2014-present

Tenured Researcher in Didactics and History of Physics (FIS/08)

Department of Philosophy and Educational Sciences, University of Turin, 2011-2014

Research fellow

Department of Physics, University of Genova, 2003-2005 and 2006-2008

EDUCATION

National Scientific Qualification (ASN)

Associate Professor, 02/B2 – Theoretical Physics of Matter, December 2013

Associate Professor, 11/C2 – Logic, History and Philosophy of Science, November 2013

Master in Science Communication, March 2004

International School for Advanced Studies (SISSA/ISAS), Trieste, Italy.

Ph.D., History of Science, February 2003

University of Bari, Italy

National qualification for teaching physics in Italian secondary school, September 2001

Provincial Education Authority, Asti, Italy

M.S., Physics, July 1996

University of Turin, Italy

TEACHING EXPERIENCE

Physics and Physics Education

Primary Education Degree (Corso di Laurea Magistrale in Scienze della Formazione Primaria), 2011-present

- University of Turin: 3 semesters between 2011 and 2014 (250 students each semester)
- University of Turin, Savigliano Campus: 3 semesters between 2011 and 2014 (100 students each semester)
- Responsible for the laboratories of the courses (3 contracts each semester)

RESEARCH EXPERIENCE

Team member of Italian National Institute of Nuclear Physics (INFN) “Radiolab” project (Turin section), for the dissemination of scientific culture, 2014-present

Team member of HOPE network (Horizons in Physics Education) within the UE Lifelong Learning Programme (partner number: P52, University of Turin), 2013-present

Member of the MIUR local research project “Science education in preschool, primary school and lower secondary school”, Department of Philosophy and Educational Sciences, University of Turin, 2013-2014

Member of the MIUR local research project “Astrophysical phenomena in stars and galaxies, and astronomy education”, Department of Physics, University of Turin, 2012-2013

Co-chairman of “Internationalism of physics during the 1920s and 1930s” symposium at *4th International Conference of the European Society for the History of Science*, Barcelona, 18-20 November 2010

Grant for “Archival research at university archives and Italian National Archive on origins and first developments of nuclear physics in Italy”, Department of Physics, Sapienza University of Rome, 2009-2010

Grant for “Scientific organization and proceedings editorship of International Conference “Antonio Borsellino in Genova, from physics to the new sciences”, CARED, University of Genova, 2008-2009

Research grant for “Birth and development of nuclear physics in Italy: the role of fellowships abroad”, Department of Physics, University of Genova, 2006-2008

Member of Genoa unit in PRIN-2005 project “Nuclear and subnuclear physics in Italy from 1930s to 1970s”

Research grant for “The discovery of radioactivity induced by neutrons studied through Enrico Fermi’s and collaborators’ laboratory notebooks”, Department of Physics, University of Genova, 2003-2005

Member of Genoa unit in PRIN-2001 project: “History of physics and astronomy in Italy in the XIX and XX”

FIELDS OF RESEARCH

History of Physics

- 2006-2014: history of physics in XIX century; Italian physicists and the Risorgimento; Italian physicists appointed as Senators for life in the Kingdom of Italy; development of the historical-scientific heritage
- 2000-2014: history of nuclear physics and history of cosmic-rays physics in the first half of 1900s; cataloguing and study of physicists’ archives
- 2007-2009: Galileo as a pioneer of experimental psychology: the discovery of reaction times
- 2001-2008: history of theoretical physics in Italy; concept of symmetry in physics; oral history
- 1997-2004: history of atomic spectroscopy in late 1800s - early 1900s; a simultaneous discovery

Physics Education

- 2011-2014: spontaneous ideas of students on physical and natural science topics, with particular reference to primary school and preschool children
- 2011-2014: relationships between history of physics and physics education; conceptual and motivational roles of historical materials for science learning and for teacher education

AWARDS

Italian National Academy of Sciences “detta dei XL” prize, awarded for the best “Master degree thesis in history of modern and contemporary physics”, 1997

Italian Physical Society (SIF) prize, awarded for the best scientific communication to the history of physics section at the 88° SIF National Congress, Alghero 2002

SELECTED PUBLICATIONS

Peer-reviewed articles in international journals indexed by ISI/Scopus

Guerra F., **Leone M.**, Robotti N. (2014). When energy conservation seems to fail: the prediction of the neutrino, *Science & Education*, 23, 1339-1359.

Leone M. (2014). History of physics as a tool to detect the conceptual difficulties experienced by students: the case of simple electric circuits in primary education. *Science & Education*, 23, p. 923-953.

Leone M. (2014). Theory versus experiment: the case of the positron. In: B.G. Sidharth et al. (eds.). *Frontiers of Fundamental Physics and Physics Education Research*, Springer Proc. Physics 145, Springer, Switzerland, p. 479-485.

Leone M., Robotti N. (2012). An uninvited guest: The positron in early 1930s physics, *American Journal of Physics*, 80, 534-541.

Guerra F., **Leone M.**, Robotti N. (2012). The discovery of artificial radioactivity, *Physics in Perspective*, 14, 33-58

Leone M. (2011). Particles that take photographs of themselves: the emergence of the triggered cloud chamber technique in early 1930s cosmic-ray physics, *American Journal of Physics*, 79, 454-460.

Leone M., Robotti N. (2010). Frédéric Joliot, Irène Curie and the early history of the positron (1932-33), *European Journal of Physics*, 31, 975-987.

Foschi R., **Leone M.** (2009). Galileo, measurement of the velocity of light, and the reaction times, *Perception*, 38, 1251-1259.

Radicati di Brozolo L.A., **Leone M.** (2008). On the emergence of the abstract concept of symmetry in physics, *Il Nuovo Cimento*, 123B, 121-135.

Leone M., Robotti N. (2008). P.M.S. Blackett, G. Occhialini and the invention of the counter-controlled cloud chamber (1931-32), *European Journal of Physics*, 29, 177-189.

Guerra F., **Leone M.**, Robotti N. (2006). Enrico Fermi's discovery of neutron-induced artificial radioactivity: neutrons and neutron sources, *Physics in Perspective*, 8, 255-281.

Leone M. (2005). Per una storia della fisica italiana: 1945-1965, vol. 1, *Isis*, 96, 673-674.

Leone M. (2005). A history of nuclear transmutations by natural alpha particles, *European Journal of Physics*, 26, 1047-1056.

Leone M., Paoletti A., Robotti N. (2004). A simultaneous discovery: the case of Johannes Stark and Antonino Lo Surdo, *Physics in Perspective*, 6, 271-294.

Leone M., Robotti N. (2004). A note on the Wilson cloud chamber, *European Journal of Physics*, 25, 781-791.

Leone M., Robotti N. (2003). Are the elements elementary? Nineteenth-Century chemical and spectroscopical answers, *Physics in Perspective*, 5, p. 360-383.

Leone M., Robotti N. (2000). Stellar, solar and laboratory spectra: the history of Lockyer's Proto-elements, *Annals of Science*, 57, 241-266.

Peer-reviewed articles in A-class international journals

Acocella G., Guerra F., **Leone M.**, Robotti N. (2007). The Oscar D'Agostino Archives in Avellino, *Physis. Rivista Internazionale di Storia della Scienza*, 44, 203-233.

Leone M., Mastroianni A., Robotti N. (2005). Bruno Rossi and the introduction of the Geiger-Muller counter in Italian physics: 1929-1934, *Physis. Rivista Internazionale di Storia della Scienza*, 42, 453-480.

Leone M., Robotti N., Segnini C.A. (2000). Fermi Archives at the Domus Galilaeana in Pisa, *Physis. Rivista Internazionale di Storia della Scienza*, 37, 501-533.

Contributions to international conferences

Leone M. (2014). Theory versus experiment: the case of the positron. In: B.G. Sidharth et al. (eds.). *Frontiers of Fundamental Physics and Physics Education Research*, Springer Proceedings in Physics 145, Springer, Switzerland, p. 479-485.

Guerra F., **Leone M.**, Robotti N. (2014). The discovery of X-rays diffraction from crystals to DNA: a case-study to promote understanding of the nature of science and of its interdisciplinary character. In: GIREP-MPTL 2014 International Conference. *Teaching/Learning Physics: Integrating research into practice. Program and Book of Abstracts* (Palermo, July 7-12, 2014), Università di Palermo, pp. 205-206.

Leone M., Robotti N. (2014). The beta decay and the conservation of energy: a historical case-study to overcome learning difficulties in the upper secondary school. In: M.F. Taşar (ed.). *Proceedings of the World Conference of Physics Education 2012*, Pegem Akademi, Ankara, Turkey, p. 495-499.

Leone M., Guerra F. (2010). Fellowships programs in the 1930s Italian physics: a survey. In: *4th International Conference of the European Society for the History of Science* (Barcelona, 18-20 November 2010). Book of abstracts, Institut d'Estudis Catalans, Barcelona, p. 141.

Leone M., Paoletti A., Robotti N. (2008). Recovering a collection of scientific instruments: the case of the scientific museum in Sanremo, Italy. In: *XXVII Scientific Instrument Symposium* (Lisbon, 16-21 September 2008), Museum of Science, University of Lisbon, Lisbon, p. 183.

Leone M., Robotti N. (2003). Artificial radioactivity in Rome (1934-35): radioactive sources and Geiger-Müller counters. In: *XXII Scientific Instrument Symposium* (Newport News, September 30 October 4, 2003), International Union of the History and Philosophy of Science, Newport News, p. 12.

Leone M., Robotti N. (2002). Lockyer's 'proto-elements' and the discovery of the electron. In: H. Kragh, G. Vanpaemel, P. Marage (eds.), *History of Modern Physics. Proceedings of the XXth International Congress of History of Science* (Liege, July 20-26, 1997), Brepols, Turnhout, p. 197-203.

Leone M., Paoletti A., Robotti N. (2002). The same discovery with different scientific instruments: the case of electric field effect on spectral lines. In: *XXI Scientific Instrument Symposium* (Athens, September 9-14, 2002), International Union of the History and Philosophy of Science, Athens, p. 39.

Leone M., Paoletti A., Robotti N. (1999). Science museums and their role: the experience of Physics Department's Museum of Genoa University. In: *2ème congrès international sur "science et technologie pour la sauvegarde du patrimoine culturel dans les pays du bassin méditerranéen"* (Paris, 5-9 juillet 1999), programme et résumés, CNR-CNRS, Paris, p. 293-94.

Biographical entries in international encyclopedia

Leone M., Robotti N. (2014). Compton, Arthur Holly. In: T. Hockey et al (eds.), *Biographical Encyclopedia of Astronomers*. 2nd edition, p. 449-451, Springer, New York.

Leone M., Robotti N. (2014). Fowler, Alfred. In: T. Hockey et al (eds.), *Biographical Encyclopedia of Astronomers*. 2nd edition, p. 744-745, Springer, New York.

Leone M., Robotti N. (2014). Roach, Franklin Evans. In: T. Hockey et al (eds.), *Biographical Encyclopedia of Astronomers*. 2nd edition, p. 1839-1840, Springer, New York.

Invited contributions to national conferences

Leone M. (in press). La storia della fisica come strumento per la didattica. In: *Frascati Physics Series – Italian Collection*. Atti di *Comunicare Fisica 2012*. IV edizione della Conferenza Nazionale su Temi e Metodi della Comunicazione della Fisica. Istituto Nazionale di Fisica Nucleare (INFN) (Torino, 8-12 ottobre 2012).

Leone M. (2014). Il silenzio del neutrino: 1934-1956. In: G. Bianchi Bazzi (a cura di), *100° Congresso Nazionale Società Italiana di Fisica* (Pisa, 22-26 Settembre 2014), Società Italiana di Fisica, Bologna, 162.

Leone M. (2013). Dal neutrone al neutrino: il periodo canadese di Bruno Pontecorvo. In: *XCIX Congresso Nazionale della Società Italiana di Fisica* (Trieste, 23-27 Settembre 2013), Società Italiana di Fisica, Bologna, 131.

Leone M. (2011). Strumenti e tecniche di misurazione alle origini della “nuova” fisica (1912-1932). *XCVII Congresso Nazionale della Società Italiana di Fisica* (L’Aquila, 26-30 Settembre 2011), Società Italiana di Fisica, Bologna, 166-167.

Leone M. (2010). Giuseppe Occhialini e l’invenzione della camera a nebbia controllata. In: E. Giannetto, G. Giannini, M. Toscano (a cura di), *Relatività, quanti, chaos e altre rivoluzioni della fisica. Atti del XXVII Congresso nazionale di Storia della fisica e dell’astronomia* (Bergamo, Giugno 2007), Guaraldi, Rimini 2010, 337-344.

Leone M. (2009). I due positroni di Joliot e Curie (1933). *XCV Congresso Nazionale della Società Italiana di Fisica* (Bari, 28 Settembre – 3 Ottobre 2009), Società Italiana di Fisica, Bologna, 60.

Leone M. (2002). La fisica teorica in Italia (1945-1965). *LXXXVIII Congresso Nazionale della Società Italiana di Fisica* (Alghero, 26 settembre – 1 ottobre 2002), Società Italiana di Fisica, Bologna, 171.