ROBERTO LALLI

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12047 Berlin, Germany
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ACADEMIC APPOINTMENTS

Research Scholar (Wissenschaftlicher Mitarbeiter)
Max Planck Institute for the History of Science — Berlin, Germany
July 2013-present

Postdoctoral fellow
Program in Science, Technology, and Society – MIT — Cambridge, MA
July 2011-June 2013

OTHER RESEARCH AFFILITATIONS

Research Scholar (Wissenschaftlicher Mitarbeiter)
Berlin Center for Machine Learning — Berlin, Germany
November 2018-

Visiting Lecturer
Technische Universität Berlin — Berlin, Germany
March 2017-

Visiting Scholar
Research Program on the History of the Max Planck Society — Berlin, Germany
January 2017-

EDUCATION

University of Milan — Milan, Italy
PhD, International History — March 2011

M.Sc. Degree in Physics — October 2006

DISSERTATION

"Ether-Drift Experiments in the 20th Century. Comparative Analysis of Two Case Studies: The Discovery of the Sagnac Effect (France, 1913) and Miller's Experiments (USA, 1921-26)" (in Italian)
Supervisor: Prof. Pasquale Tucci
Committee: Fabio Bevilacqua, Francesco Guerra

QUALIFICATIONS

Habilitation Associate Professor, Italy, 11/C2 (Logics, History and Philosophy of Science) — 29 March 2018

Habilitation Associate Professor, Italy, 02/D1-Fis/08 (History and Didactics of Physics) — 10 April 2018

PARENTALE LEAVE

9 October 2020-8 December 2020

HONORS, GRANTS AND FELLOWSHIPS

One-month Junior Research Fellowship — February 2020
Department of Philosophy, University of Milan

Two-year SPIN 2018 Grant, 1st in Final ranking (declined) — November 2018

Ca' Foscari University, Venezia

2-month Research Fellowship — January-March 2017
Van Leer Jerusalem Institute

Research Grant — 2016
Center for History of Physics - American Institute of Physics.

Maurice A. Biot Grant-in-Aid — 2013
California Institute of Technology

Research Grant — 2013
Center for History of Physics - American Institute of Physics.

Research Grant for 3-month research in various American archives — 2010
Center for History of Physics - American Institute of Physics.

3-year Scholarship for the Ph.D. course in International History — 2007-2010
University of Milan.

RESEARCH PROJECTS

1. *Path to Exoplanet Search* — November 2018-

   I am responsible for the development of historically meaningful machine-learning approaches to the textual analysis of the scientific literature on exoplanet research within the newly established multi-institutional *Berlin Center for Machine Learning* funded by the *Bundesministeriums für Bildung und Forschung* (German Federal Ministry of Education and Research). The goal is to establish reliable methods that can be employed for the historical analysis of the field of exoplanet exploration.
   Outcome: Conference presentation Nr. 3

2. *Astrophysics and astronomy at the Max Planck Society* — January 2017-

   Participation as Visiting Scholar in the *Research Program on the History of the Max Planck Society*. The research program aims at a comprehensive analysis of the history of the Max Planck Society embedded in the contexts of contemporary history and history of science. The research program has a focus on the dynamic interactions of research practice and institutional history; on the changes in working methods and research objectives of the MPG; on its local and global networks and how these are embedded in science, society and politics. In the framework of the GMPG Research Program I am developing approaches informed by Social Network Analysis to explore the historical evolution of the fields of astrophysics and astronomy within the Max Planck Society from 1948 to 2002. Network analytical tools, combined with text mining tools, have been applied to biographical and bibliographical data in order to uncover the collaborative and decision-making structures within the Max Planck Society as well as the position of the scientific production of the Max Planck Society within the international scientific landscape (see also project 4).
   Outcome: Publication Nr. 38, and conference presentation Nr. 30

3. *The Renaissance of General Relativity in the post-WWII period* — January 2014-

   I am one of the co-organizers (with Alexander Blum and Jürgen Renn) of a multi-institutional collaboration including 20 scholars from 12 institutions. The project is funded by the *Max Planck Institute for the History of Science* and aims at understanding the connections of epistemic and social factors in the reconfiguration of knowledge related to the process known as the 'renaissance' of general relativity, namely the return of general relativity to the mainstream of physics after a long period of marginalization. Within this framework I focused especially on the social dimension of the formation of the field named "General Relativity and Gravitation." I am applying a variety of approaches, including close reading of scientific texts, prosopography, and digital humanities tools, such as text mining techniques, topic modeling and social network analysis (see also project 4). By mapping the network of collaborations in the research fields related to general relativity from 1930 to the early 1970s, the

dramatic changes in the connectivity of this network in the post-WWII period are shown. The topological transitions of the network of collaboration provide an unambiguous method to define the historical process of the renaissance of general relativity as well as its periodization. The network analysis also enables the definition of some specific features of the process, which otherwise would not be understandable, such as the role of specific actors in the dynamics of knowledge production in general relativity in connecting different disciplines and research agendas. This research shows in which specific ways the phenomenon of the "postdoc cascade" increased the connectivity between different research groups and different research agendas, allowing for the emergence of a common field pursued by a network of practitioners with a shared baggage of tools and research questions. In addition, a study of the activities of community building and institutionalization in the field in the international arena between the 1950s and the 1970s has been completed. My monograph, *Building the General Relativity and Gravitation Community During the Cold War* (Springer 2017), shows how intertwined the epistemic, cultural, social, and political aspects were in the attempt to build an international community of "relativists" during the Cold War. It emerges that features specific to the field of general relativity first favored such an international exchange in the 1950s and then allowed scholars to overcome a number of tensions of a different nature, eventually leading to the formation of the International Society on General Relativity and Gravitation, which had quite a unique structure in the landscape of international scientific organizations at that time. The monograph has been reviewed very positively in major peer-reviewed journals in the history of science such as *Isis* and the *British Journal for the History of Science*.
Within this project, I have co-organized various workshops and conference sessions, including a large conference with more than one hundred attendees to celebrate the 100th anniversary of general relativity (2-5 December 2015, Harnack Haus, Berlin).
Outcomes: Publications Nr. 1, 2, 4, 7, 9-11, 13, 18, 19, 21, 25, 38, 40, and conference presentations Nr. 1, 2, 9, 10, 14, 16, 19, 22-24, 26-29, 32-35

4. *Networks, network science and knowledge graph* January 2014-

The project, funded by the *Max Planck Institute for the History of Science,* seeks to develop new methodologies of computational history of science based on theoretical advances in social network analysis and semantic modeling for the description of data. Both approaches result in the description and analysis of networks—one focusing on dynamic changes and their driving forces, the other on the semantics of the network. Building on these approaches, the project aims at uncovering hidden connections within and between different layers of the scientific enterprise, from its social dimension to the material condition of knowledge production, up to conceptual transformations. In order to create such a unified conceptual framework we define knowledge networks as being composed of three different layers: the social network, the semiotic network, and the semantic network. The first is defined as the collection of relations involving individuals and institutions. The semiotic network is defined as the collection of the material or formal representations of knowledge. The semantic network is the collection of knowledge elements and its relations. We call the interlinked set of these three levels *socio-epistemic networks*. The complex interaction of these three networks defines the dynamics of historical structural changes.
I have been co-developing the conceptual framework for the combined analysis of socio-epistemic networks as well tools and methodologies applied to some cases in the history of science in connection with projects 1, 2, and 3.
Outcomes: Publications Nr. 7, 9, 18, 21, 39, and conference presentations Nr. 1, 2, 9, 16-18, 21-23, 26, 28-30, 32-34

5. *Changing Contexts and Practices of Basic Science during the Twentieth Century*
January 2013-

PI in a project that has been previously funded through various research grants from the *AIP Center for the History of Physics* and *Caltech*, and is currently funded by the *Max Planck Institute for the History of Science*. The project seeks to investigate the cultural, social and political transformation of physics in the 20th century. These changes affected the daily practices of physicists in multiple ways, from the increasing level of cooperation between practitioners to the definition of shared standards for communicating research products and certifying their validity. One major change concerned editorial practices. The peer review, for instance, only became the ubiquitous, pervasive practice we know today—where a review by external referees is a requirement for editors to publish papers—in the late 1960s. I investigate the historical transformations of editorial strategies and refereeing practices and

evaluate the impact of these transformations on the evolution of research agendas in twentieth-century physics.
A second focus of the project concerns the historical development of science diplomacy by looking at the role of physics projects and physicists in diplomatic matters during the Cold War. By situating the history of international scientific institutions within the broader political processes of the European integration and the Cold War, I show that institutional bodies, such as the European Physical Society, in response to increasing political tensions transformed themselves in diplomatic initiatives aimed at spreading liberal values and supporting dissident scientists in Eastern Europe.
Outcomes: Publications Nr. 3, 5, 6, 8, 12, 14, 19, 24, and conference presentations Nr. 4-8, 10-15, 30, 36, 37, 39, 41

6. *Ether and Modernity*

July 2016-August 2018

Participation to the project supported by the Ministerio de Economia y Competitividad of the Spanish Government (HAR2015-67831-P) and directed by Prof. Jaume Navarro. Analysis of persistence of the ether concept within the physics literature in the first half of the 20th century partially based on my PhD and Post-doc research results (see also project 8).
Outcomes: Publication Nr. 20, and conference presentation Nr. 25

7. *History of Physics and Chemistry Seen through the Nobel Prizes: Complexity, Reduction, and Emergence*

July 2013-December 2014

PI in the project funded by the *Lindau Nobel Laureates Meeting Foundation*. I wrote scientific biographies of 34 Nobel Laureates in Physics within the analytical framework of the dichotomy between reductionism and emergentism.
Outcomes: Publications Nr. 41-74

8. *The other side of the relativistic revolution: A comparative history of anti-relativity. Case studies in USA and France*

July 2011-June 2013

PI in the project funded as Post-doctoral Fellowship in the History of Modern Physical Sciences at the *Program in Science, Technology, and Society of Massachusetts Institute of Technology*. This research investigated the roles of local and national factors in the activities of those physicists who tried to disprove relativity theories by providing evidence for the existence of the luminiferous ether in the United States and in France in the first half of the twentieth century. Focusing on various case studies, I showed how local press campaigns, national authority systems and disciplinary politics, as well as ideologies diffused in scientists' research environment, strongly shaped the interpretations physicists developed on the theories of relativity (both special and general). My historical analysis also demonstrates that the main motivations grounding these experimental activities were not the anti-Semitic tendencies some of the studied scientists later manifested. Rather, they were mostly motivated by the fact that the difficult-to-understand conceptual advances and mathematical tools of relativity theories made previously authoritative figures marginal within the intellectual milieu of physics communities, which were renovating themselves following theoretical advances in relativity and quantum physics.
Another important result of this research concerns the unexpected fruitfulness that fringe scientific activities had in the progress of science. While the explicit goals of the experimenters were to confute Einstein's theories, their efforts ended up by producing new knowledge that either provided further confirmation of relativity theories, or led to the discovery of new effects (e.g. the Sagnac effect) that are now commonly used in navigation as well as in physics textbooks. At times, the activities of these scientists who became increasingly dissident with respect to mainstream physics also provided refined ground for the philosophical debates concerning the implications of relativity theories for the concepts of space and time, and more deeply for what counts as proper explanation in the natural sciences.
Outcomes: Publications Nr. 15-17, 26-32, and conference presentations Nr. 42-48

TEACHING

University of Turin Turin, Italy
Visiting Professor 2020-2021
History of science
36 hours course, 6 ECTS, for master students in philosophy at the University of Turin. https://filosofialm.campusnet.unito.it/do/corsi.pl/Show?_id=tqo1

Technische Universität Berlin Berlin, Germany
Visiting Lecturer 2017-

Seminar – Science goes international: Ideals and practices of scientific internationalism from the 19th century to present April-July 2019
28 hours of frontal lessons, 5 ECTS, for bachelors and master students in the History of Science Program directed by Prof. Friedrich Steinle. The course problematized the notions of scientific internationalism and epistemic universalism showing how these ideals were embedded in the historically changing political, social and cultural contexts of practitioners. Topics of the course included: the dichotomy between the creation of nation-states, on the one hand, and the parallel rise of the internationalist agendas, on the other; the contrasting ways in which scientists positioned themselves in these changing contexts, including the context-dependent and uneasy tensions between scientists' internationalist views and their allegiances to nation-states' interests and political agendas; the epistemic implications of this tension on scientists' relations with the emerging categories of secret, certified, or sensitive knowledge; the implementation of these contextually-dependent ideals through the establishment of international collaborations and institutions; the diplomatic roles of science and scientists, historicizing what is now understood as science diplomacy.

Seminar - Twentieth Century Physics in Context April-July 2018
28 hours of frontal lessons, 5 ECTS, for bachelors and master students within the History of Science Program directed by Prof. Friedrich Steinle. The aim of the course was twofold. First, it presented the conceptual evolution of modern physics as well as its shifting practices with a special focus on the connections between these historical processes and relevant institutional, political, social and cultural contexts. Second, it discussed some of the most controversial debates in the historiography of modern physics, including the dichotomy continuity/discontinuity between classical and modern physics, the notion of "scientific revolution" and its problems when applied to the emergence of modern physics, the impact of specific national cultures and of the Cold War context in its developments, the role of education and local traditions in the reception and evolution of novel theories, tools and practices.

Seminar - Introduction to Historical Network Research April-July 2017
28 hours of frontal lectures, 5 ECTS, for bachelors and master students within the History of Science and Technology Program directed by Prof. Friedrich Steinle.
The seminar was an introduction to an emerging research subject: the application of formal methods of Social Network Analysis (SNA) to historical research. A broad view on the notions, concepts, and methods of the network theory was provided, including the basic relevant mathematical ideas and the most useful software programs. The second part of the course provided theoretical analyses, epistemological perspectives and practical applications of this methodology in historical research. Cases drawn from the history of science were investigated to interpret the advancement of knowledge as resulting from the dynamics of social and epistemic networks.

University of Milan Milan, Italy
Teaching Assistantship 2008-2011
History of Physics (Professor Pasquale Tucci)
Tutoring students and 6 hours of frontal lessons per year on the following topics: development of optics and electromagnetic theory between the late 19th century and the early 20th century, the formulation of special and general relativity theories and their reception.

PUBLICATIONS

Monograph

1. *Building the General Relativity and Gravitation Community during the Cold War* (Cham: Springer, 2017).

Edited Volume

2. (with Alexander Blum and Jürgen Renn) *The Renaissance of General Relativity in Context,* volume in the Einstein Studies series (Boston: Birkhäuser, 2020). https://www.springer.com/gp/book/9783030507534

Edited Special Issues

3. (with Matthew Adamson) *Global Perspectives on Science Diplomacy,* special issue *Centaurus,* 63(1) (2021)

4. (with Alexander Blum, Domenico Giulini, Jürgen Renn) *The renaissance of Einstein's theory of gravitation,* special issue of *European Physical Journal H,* 42 (2017) [OA]

Articles in refereed journals

5. "Crafting Europe from CERN to Dubna: Physics as diplomacy in the foundation of the European Physical Society" *Centaurus* 63 (2021): 106-134 https://onlinelibrary.wiley.com/doi/10.1111/1600-0498.12304 [OA}

6. (with Simone Turchetti) "Envisioning a "science diplomacy 2.0: On data, global challenges and multi-layered networks" *Humanities & Social Sciences Communications* (formerly *Palgrave Communications*) 7 (2020): 144. [OA}

7. Corresponding author (with Matthew Adamson) "Global Perspectives on Science Diplomacy: Diplomatic history and history of science in dialogue" *Centaurus* 63 (2021): 1-19. [OA}

8. First and corresponding author (with Riaz Howey and Dirk Wintergrün) "The dynamics of collaboration network and the history of general relativity, 1925-1970." *Scientometrics* 122: 1129-1170 *https://link.springer.com/article/10.1007/s11192-019-03327-1* [OA]

9. "A brief history of physics reviews." *Nature Reviews Physics* 1 (2019), pp. 12-14.

10. Corresponding author (with Alexander Blum and Jürgen Renn) "Gravitational Waves and the Long Relativity Revolution." *Nature Astronomy* 2 (2018): 534-543.

11. Corresponding author (with Alexander Blum, Domenico Giulini and Jürgen Renn) Editorial introduction to the special issue "The Renaissance of Einstein's Theory of Gravitation". *European Physical Journal H*, 42(2) (2017): 95-105. doi:10.1140/epjh/e2017-80023-3. [OA]

12. Corresponding author (with Alexander Blum and Jürgen Renn) "The Renaissance of General Relativity: How and Why it Happened." *Annalen der Physik* 528 (2016): 344-349. Corresponding author. [OA]

13. "'Dirty work' but someone has to do it: Howard P. Robertson and the refereeing practices of *Physical Review* in the 1930s." *Notes and Records: The Royal Society journal of history of science* 70 (2016): 151-174. [OA]

14. (with Alexander Blum and Jürgen Renn) "The Reinvention of General Relativity: A Historiographical Framework for Assessing One Hundred Years of Curved Space-time." *Isis* 106 (2015): 598-620.

15. "A New Scientific Journal Takes the Scene: The Birth of Reviews of Modern Physics." *Annalen der Physik* 526 (2014): A83-87. [OA]

16. "Anti-Relativity in Action: The Scientific Activity of Herbert E. Ives between 1937 and 1953." *Historical Studies in the Natural Sciences* 43 (2013): 41-104.

17. "The Reception of Miller's Ether-Drift Experiments in the USA: The History of a Controversy in Relativity Revolution." *Annals of Science,* 69 (2012): 153-214.

18. "Effetto Sagnac (1913): Storia di un mancato dibattito nella Francia degli anni '20." [*The Sagnac Effect (1913): History of a Missing Debate in France during the 1920s*]. *Quaderni di Storia della Fisica*, 17 (2011): 47-81 (in Italian).

Chapters in books

18. Corresponding author (with Alexander Blum and Jürgen Renn) "The Renaissance of General Relativity in Context: A Historiographical Review," in *The Renaissance of General Relativity in Context,* ed. A. Blum, R. Lalli, J. Renn (Boston: Birkhäuser, 2020), pp. 1-14.

19. Corresponding author (with Riaz Howey and Dirk Wintergrün) "Socio-Epistemic Networks of general relativity, 1925-1970," in *The Renaissance of General Relativity in Context,* ed. A. Blum, R. Lalli, J. Renn (Boston: Birkhäuser, 2020), pp. 15-84.

20. "The multiple lives of the general relativity community, 1955-1974." In *Biographies in the History of Physics: Actors, Institutions, and Objects,* edited by C. Forstner and M. Walker (Springer, 2020), pp. 179-202.

21. "Hunting for the luminiferous ether: The revival of the Michelson-Morley experiment in the 1920s." In *Ether and Modernity: The Recalcitrance of an Antagonizing Object in the Early Twentieth Century*, edited by Jaume Navarro (Oxford: Oxford University Press, 2018), pp. 155-178.

22. (with Dirk Wintergrün, Jürgen Renn, Manfred Laubichler, Matteo Valleriani) "Netzwerke als Wissensspeicher." In *Die Zukunft der Wissensspeicher: Forschen, Sammeln und Vermitteln im 21. Jahrhundert*, edited by Jürgen Mittelstraß. (Konstanz: Konstanzer Wissenschaftsforum, Universitätsverlag Konstanz, 2016), pp. 35-79.

23. "'The Renaissance of Physics': Karl K. Darrow (1891-1982) and the Dissemination of Quantum Theory at the Bell Telephone Laboratories." In *A Bridge between Conceptual Frameworks: Sciences, Society and Technology Studies*, edited by R. Pisano (Springer: Dordrecht, 2015), pp. 249-273.

Papers in Conference Proceedings

23. First and corresponding author (with Dirk Wintergrün) "Toward a computational history of science: The dynamics of socio-epistemic networks and the renaissance of general relativity." In *Società Italiana degli Storici della Fisica e dell'Astronomia. Atti del XXXIX Convegno Annuale* (Pisa: Pisa University Press, 2020), pp. 253-265. [OA]

24. "Patterns to scientific internationalism: What can a comparative history of IAU and IUPAP teach us?" In *Under One Sky: The IAU Centenary Symposium Proceedings IAU Symposium No. 349, 2018,* edited by D. Valls-Gabaud, J. Hearnshaw, & C. Sterken (Cambridge: Cambridge University Press, 2019), pp. 189-196.

25. (With Luisa Bonolis and Adele La Rana) "The renaissance of general relativity in Rome: Main actors, research programs and institutional structures." In *14th Marcel Grossman Meeting On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics and Relativistic Field Theories, Proceedings* (World Scientific 2018), pp. 3372-3377.

26. "The Interplay of Theoretical Assumptions and Experimental Practice in the History of 20th-Century Ether-Drift Experiments." In *Società Italiana degli Storici della Fisica e dell'Astronomia. Atti del XXXIII Convegno Annuale* (Pavia: Pavia University Press, 2016), pp.343-360. [OA]

27. "'Geometry as a Branch of Physics': Philosophy at Work in Howard Percy Robertson's contribution to Relativity Theories." In *New Directions in Logic and the Philosophy of Science,* edited by L. Felline, A. Ledda, F. Paoli, E. Rossanese (Milton Keynes: College Publications, 2016), pp. 279-289.

28. "Confirming Relativity in Spite of Himself: The Origin of the Ives-Stilwell Experiment." In *Physics, Astronomy and Engineering. Critical Problems in the History of Science. International 32nd Congress for The SISFA–Italian Society of Historians of Physics and Astronomy*, edited by R. Pisano, D. Capecchi and A. Lukešová (Šiauliai, Lithuania: Scientia Socialis UAB & Scientific Methodical Centre Scientia Educologica Press Šiauliai University, 2013), pp. 298-304.

29. "L'anti-relativismo negli USA. Uno Studio preliminare sui principali attori: Dayton C. Miller, Herbert E. Ives, Charles L. Poor" [*Anti-Relativity in the USA: A preliminary analysis on the main actors: Dayton C. Miller, Herbert E. Ives, Charles L. Poor*]. In *Atti del XXX Congresso della SISFA*, edited by R. Mantovani (Urbino: Argalia Editore, 2012), pp. 203-12 (in Italian).

30. "Dayton C. Miller's Ether-Drift Experiments." In *The Circulation of Science and Technology: Proceedings of the 4th International Conference of the ESHS, Barcelona, 18-20 November 2010*, edited by A. Roca-Rosell (Barcelona: SCHCT-IEC, 2012), pp. 1093-1100.

31. "G. M. M. Sagnac e la difesa dell'etere di Fresnel" [*G. M. M. Sagnac and the defence of Fresnel's ether*]. In *Intorno a Galileo: La Storia della Fisica e il Punto di Svolta Galileiano.* Vol. 9 of Quaderni del CE.R.CO.*,* edited by E. Giannetto, G. Giannini, and M. Toscano (Rimini: Guaraldi, 2011), pp. 146-57 (in Italian).

32. "The Sagnac Effect: A Historical Study of the Discovery and of Its Earlier Interpretations." In *Styles of Thinking in Science and Technology: Proceedings of the III International Congress of the European Society for the History of Science*, edited by H. Hunger, F. Seebacher, and G. Holzer, (Wien, Austrian Academy of Science Press, 2010), pp. 963-71.

Book Reviews

33. "Review of Dominique Lambert: The Atom of the Universe: The Life and Work of Georges Lemaître." *Physics in Perspective* 21 (2019): 87-90

34. "Review of Harry Collins: *Gravity's Kiss: The Detection of Gravitational Waves.*" *Isis* 109 (2018): 885-887.

35. "Reviews of Marcia Bartusiak. *Black Hole: How an Idea Abandoned by Newtonians, Hated by Einstein, and Gambled on by Hawking Became Loved.*; Andrew Robinson; Diana Kormos Buchwald. *Einstein: A Hundred Years of Relativity.*" *Isis* 107 (2016): 881-883

36. "Review of Cathryn Carson: *Heisenberg in the Atomic Age: Science and the Public Sphere*, Cambridge, Cambridge University Press, 2010." *Centaurus*, 57 (2015): 260-261.

37. "Einstein as founding father of quantum theory. Review of Douglas A. Stone: Einstein and the quantum: The search of the valiant Swabian, Princeton: Princeton University Press, 2013." *Metascience*, 24 (2015): 119-122.

Other Publications

38. "Onde gravitazionali e teoria della relatività generale: una storia complessa," *Il Giornale di Astronomia* 45 (2019): 19-28.

39. (with Dirk Wintergrün) Networks of Knowledge in the History of science: Epistemological and methodological perspectives. MPIWG preprint series (in preparation).

40. "La Rinascita della Relatività Generale nel Secondo Dopoguerra." *Il Giornale di Astronomia,* 42 (2016): 32-37. [OA]

41. "Scientific Biography: Philip Warren Anderson." *Lindau Nobel Mediatheque* (2015), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-anderson [OA]

42. "Scientific Biography: John Bardeen." *Lindau Nobel Mediatheque* (2015), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-bardeen [OA]

43. “Scientific Biography: Leon Neil Cooper.” *Lindau Nobel Mediatheque* (2015), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-cooper [OA]

44. “Scientific Biography: Leo Esaki.” *Lindau Nobel Mediatheque* (2015), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-esaki [OA]

45. “Scientific Biography: Ivar Giaever.” *Lindau Nobel Mediatheque* (2015), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-giaever [OA]

46. “Scientific Biography: Werner Heisenberg.” *Lindau Nobel Mediatheque* (2015), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-heisenberg [OA]

47. “Scientific Biography: Chandrasekhara Venkata Raman.” *Lindau Nobel Mediatheque* (2015), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-raman [OA]

48. “Scientific Biography: Brian D. Josephson.” *Lindau Nobel Mediatheque* (2015), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-josephson [OA]

49. “Scientific Biography: Nevill F. Mott.” *Lindau Nobel Mediatheque* (2015), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-mott [OA]

50. “Scientific Biography: John R. Schrieffer.” *Lindau Nobel Mediatheque* (2015), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-schrieffer [OA]

51. “Scientific Biography: James W. Cronin.” *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-cronin [OA]

52. “Scientific Biography: Val L. Fitch.” *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-fitch [OA]

53. “Scientific Biography: Jerome I. Friedman.” *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-friedman [OA]

54. “Scientific Biography: Murray Gell-Mann.” *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-gell-mann [OA]

55. “Scientific Biography: Sheldon L. Glashow.” *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-glashow [OA]

56. “Scientific Biography: David J. Gross.” *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-gross [OA]

57. “Scientific Biography: Gerardus ‘t Hooft.” *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-t-hooft [OA]

58. “Scientific Biography: Leon M. Lederman.” *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/laureates/lederman [OA]

59. “Scientific Biography: Martin L. Perl.” *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-perl [OA]

60. “Scientific Biography: Carlo Rubbia.” *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-rubbia [OA]

61. “Scientific Biography: Melvin Schwartz.” *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-schwartz [OA]

62. “Scientific Biography: Jack Steinberger.” *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-steinberger [OA]

63. “Scientific Biography: Richard E. Taylor.” *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-taylor [OA]

64. "Scientific Biography: Samuel Chao-Chung Ting." *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-ting [OA]

65. "Scientific Biography: Simon van der Meer." *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-van-der-meer [OA]

66. "Scientific Biography: Martinus J. G. Veltman." *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-veltman [OA]

67. "Scientific Biography: Steven Weinberg." *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-weinberg [OA]

68. "Scientific Biography: Frank Wilczek." *Lindau Nobel Mediatheque* (2014), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-wilczek [OA]

69. "Scientific Biography: Niels H. D. Bohr." *Lindau Nobel Mediatheque* (2013), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-bohr [OA]

70. "Scientific Biography: Tsung-Dao Lee." *Lindau Nobel Mediatheque* (2013), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-lee [OA]

71. "Scientific Biography: Julian Schwinger." *Lindau Nobel Mediatheque* (2013), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-schwinger [OA]

72. "Scientific Biography: Eugene P. Wigner." *Lindau Nobel Mediatheque* (2013), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-wigner [OA]

73. "Scientific Biography: Chen Ning Yang." *Lindau Nobel Mediatheque* (2013), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-yang [OA]

74. "Scientific Biography: Hideki Yukawa." *Lindau Nobel Mediatheque* (2013), http://www.mediatheque.lindau-nobel.org/research-profile/laureate-yukawa [OA]

INVITED LECTURES AND SELECTED CONFERENCE PRESENTATIONS

1. "The Socio-Epistemic Networks of General Relativity, 1925-1970: The low-water mark, the renaissance, and the astrophysical turn." Invited talk at the Black Hole Initiative Colloquium, Harvard University, 24 November 2020.

2. "Interpreting complex data in the history of science with network theory: The Socio-epistemic networks of general relativity, 1925-1970," Invited talk at the Seminar of the Max Planck Research Group The Historical Epistemology of the Final Theory, Berlin, 28 September 2020.

3. "The Socio-Epistemic Networks of General Relativity, 1925-1970: The low-water mark, the renaissance, and the astrophysical turn." Invited talk at the 106th Congress of the Italian Physical Society (SIF), virtual, 14-18 September 2020.

4. "Understanding scientific texts with machine learning: A computational approach to the history of exoplanet exploration." Talk presented at 9th Congress of the European Society for the History of Science, Bologna (virtual), 31 August-3 September 2020.

5. "Physics, European integration and the Cold War: The foundation of the European Physical Society as a case of science diplomacy." Invited talk, *Italian Society for the History of Science Virtual Seminars*, 2 July 2020.

6. "The history of modern physics in the academic landscape: Thoughts from its past and present disciplinary and thematic frameworks." Invited talk, Seminar series *History for Physics: Quantum gravity,* Albert Einstein institute, Golm, 28 November 2019.

7. "Editing scientific journals: Forms, practices and norms from the 19th century to the present." Invited talk, *Celebrating 150 years of Nature, Berlin Science Week*, Berlin, 4 November 2019.

8. "Crafting Europe from CERN to Dubna: Gilberto Bernardini's role in the foundation of the European Physical Society in 1968." Invited talk at the 105th Congress of the Italian Physical Society (SIF), L'Aquila, 23-27 September 2019.

9. "Crafting Europe from CERN to Dubna: The foundation of the European Physical Society during the Cold War." First Conference of the International Academy for the History of Science, Athens, 12-15 September 2019.

10. "Toward a computation history of science: The dynamics of socio-epistemic network in the renaissance of general relativity." Invited talk at the 39th Congress of the Italian Society for the History of Physics and Astronomy (SISFA), Pisa, 9-12 September 2019

11. "Institutional Lives: Biography as analytical tool for a unified narrative of international scientific organizations." Presented at the 2019 HSS Meeting, Utrecht, 23-27 July 2019.

12. "Physicists as Diplomats: International Scientific Societies, European Integration and Prague 1968." Workshop Diplomats in science diplomacy: Promoting scientific and technological collaboration in international relations. First workshop of the Commission on Science, technology, and Diplomacy of the DIST/IUHPS, Copenhagen, 19-20 July 2019.

13. "Europe By Design: The Foundation Of The European Physical Society During The Cold War." Presented at the 2018 HSS Meeting, Seattle, 1-4 November 2018.

14. "Crafting Europe (from CERN to Dubna): The foundation of the European Physical Society between science and politics." Invited Plenary Lecture at the 3rd International Conference on the History of Physics, San Sebastian, 18-20 October 2018.

15. "Spacetime diplomacy: Unifying the international general relativity community during the Cold War," presented at the 8th international conference of the European Society for the History of Science, London, 14-17 September 2018.

16. "Patterns to scientific internationalism: What can a comparative history of IAU and IUPAP teach us?" Invited paper in Under One Sky – the IAU Centenary Symposium S349, IAU General Assembly, Wien, 28-31 August 2018.

17. (with Dirk Wintergrün) "Socio-Epistemic networks and theory change in the history of 20th century science: The case of general relativity." XXXVIII Sunbelt Conference, Utrecht, June 26-July 1 2018.

18. (with Dirk Wintergrün) "New approaches for modeling socio-epistemic networks in historical research" XXXVIII Sunbelt Conference, Utrecht, June 26-July 1 2018.

19. "Toward an integrated socio-epistemic narrative of the history of 20th century physics." Invited talk at the Symposium on the History of Science and Technology, EPFL Lausanne, 30-31 May 2018.

20. "Institutionalizing Einstein's Theory During the Cold War: Toward a Biography of the International Society on General Relativity and Gravitation." Workshop 'Biographies in the History of Physics', Bad Honnef, 22-25 May 2018.

21. "Panoramica sulla storia della fisica recente negli Stati Uniti e in Germania: Tra affiliazioni istituzionali e direzioni di ricerca." Invited talk at the Workshop 'Prospettive della Storia delle Scienze Esatte', Rome, 20-21 April 2018.

22. (with Dirk Wintergrün) "Methods and Tools for Network Analysis in the History of Science – Judging quality of data". Invited talk at the International Workshop on Graphs, networks and digital humanities, Bucharest, 8-11 October 2017.

23. (with Dirk Wintergrün) "Building a Scientific Field in the Post-WWII Period: A Network Analysis of the Renaissance of General Relativity" Invited Talk at the International Workshop on Graphs, networks and digital humanities, Bucharest, 8-11 October 2017.

24. (with Dirk Wintergrün) "Building a scientific field in the Post-WWII Era: A Network Analysis of the Renaissance of General Relativity." Third European Conference on Social Networks - EUSN 2017, Mainz, 26-29 September 2017.

25. "The renaissance of General relativity and the Construction of the International GRG Community, 1955-1975," invited talk at the 103^{3d} Congress of the Italian Physical Society (SIF), Trento, 11-15 September 2017

26. "Hunting for the luminiferous ether: The American revival of the Michelson-Morley experiment in the 1920s," Invited talk at the Symposium "Ether and Modernity: The Recalcitrance of an Antagonizing Object in Physics and Culture," San Sabastian/Donostia, 30-31 March 2017.

27. "Establishing a Scientific Field in the Post-WWII Era: A Network Analysis of the Renaissance of Einstein's Theory of Gravitation." Invited talk at the Image, Knowledge Gestaltung. An Interdisciplinary Laboratory. Humboldt Universität, Berlin, 7 November 2016.

28. "Back with a Flourish: Social and Epistemic Factors in the post-WWII Renaissance of General Relativity." Invited talk at the 36th Congress of the Italian Society for the History of Physics and Astronomy (SISFA), Napoli, 4-7 October 2016.

29. "Building a scientific field in the Post-WWII Era: A Network Analysis of the Renaissance of General Relativity." Invited talk at the Niels Bohr Archive History of Science Seminars, Copenhagen, 28 September 2016.

30. "Building a scientific field in the Post-WWII Era: A Network Analysis of the Renaissance of General Relativity." Presented at the 7th Congress of the European Society for the History of Science, Prague, 22-24 September 2016.

31. (With Dirk Wintergrün) "A Network Approach to the History of Astrophysics and Astronomy at the Max Planck Society," at the conference Opening New Windows on the Cosmos: Astronomy and Astrophysics in the History of the Max Planck Society, Max Planck Institute for the History of Science, Berlin, 6-8 September 2016

32. "The coming of age of American Physical Society's periodicals: Editorial strategies and refereeing practices of the Physical Review and its sister journals under John T. Tate's editorship (1926-1950)." Presented at Transitions: The Eighth British-North American Joint Meeting of the BSHS, CSHPS, and HSS, University of Alberta, Edmonton, 22-25 June 2016.

33. (with Dirk Wintergrün) "Building a scientific field in the Post-WWII Era: A Network Analysis of the Renaissance of General Relativity." Invited talk at the Forschungskolloquium zur Wissenschaftsgeschichte, Technische Universität, Berlin, 15 June 2016.

34. "Building a scientific community in the Post-War Era: A Social Network Analysis of the Renaissance of General Relativity." Invited talk at the Seminar of Historical Epistemology, University of Milan, 26 February 2016.

35. "Building a scientific community in the Post-War Era: A Social Network Analysis of the Renaissance of General Relativity." Invited talk at the Sphere Seminar, Paris, 12 January 2016.

36. "Building the GRG Community during the Cold War: Communication Channels and Institutional Frames in Transition (1955-1975)." Invited talk at the conference A Century of General Relativity, Harnack Haus, Berlin, 2-5 December 2015.

37. "'The Renaissance of Physics': Karl K. Darrow (1891-1982) and the Dissemination of Quantum Theory at the Bell Telephone Laboratories," at the HQ-4, Fourth Conference on the History of Quantum Physics, San Sebastian, Spain, 15-18 July 2015

38. "'Dirty work' but someone has to do it: Howard P. Robertson and the refereeing practices of Physical Review in the 1930s." Invited talk at the conference Publish or Perish? Scientific Periodicals from 1665 to the Present, Royal Society, London, 19-21 March 2015.

39. "Building the Relativity Community in Post-World War II Era: The Role of Communication Channels and Stabilization Processes in the Renaissance of General Relativity." Invited talk at the conference Space-Time Theories: Historical and Philosophical Contexts, Van Leer Jerusalem Institute, Jerusalem, 5-8 January 2015.

40. "Quantum Physics Enters the Bell Labs: Assessing the Continuity/Discontinuity Controversy in an Industrial Laboratory," presented at the 6th International conference of the European Society for the History of Science, Lisbon, 4-6 September 2014.

41. "Special Relativity in the USA (1920-1940): The Relationship between Experimental Confirmations and Theoretical Controversies." invited talk at the 99th Congress of the Italian Physical Society (SIF), Trieste, 22-27 September 2013.

42. "Establishing the standards for publication in theoretical physics: Howard P. Robertson and the refereeing practice in the United States (1930-1940)." Invited talk at the symposium "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.

43. **"**The Interplay of Theoretical Assumptions and Experimental Practice in the History of 20th Century Ether-Drift Experiment." Invited talk at the 33th congress of the Italian Society for the History of Physics and Astronomy (SISFA), Acireale, 4-7 September 2013.

44. "The revival of the Larmor-Lorentz ether theories: Herbert E. Ives's opposition to relativity between 1937 and 1953," presented at the 5th Conference of the European Society for the History of Science, Athens, 1-3 November 2012.

45. "Transferring the ether concept in the USA: Herbert E. Ives's theory and his opposition to relativity," presented at the HSS/BSHS/CSHPS 3-Society 2012 Meeting, Philadelphia, PA, 11-14 July 2012.

46. "Developing Consensus on Relativity: The Controversy about Miller's Ether-Drift Experiments," presented at the HSS Annual Meeting, Cleveland, OH, 3-6 November 2011.

47. "La contrapposizione tra le teorie di Lorentz e Einstein nell'opera sperimentale e teorica di Herbert E. Ives (1882-1953)" [*The contrast between the theories of Lorentz and Einstein in the experimental and theoretical works of Herbert E. Ives (1882-1953)*], presented at the 97th Congress of the Italian Physical Society (SIF), L'Aquila, 26-30 September 2011.

48. "The relation between the reception of relativity and the ether-drift experiments in the 1920s," presented at the meeting Continuity and Discontinuity in the Physical Sciences since the Enlightenment: A Conference for Graduate Students and Early-Career Scholars. Organized by AIP-Center for History of Physics, College Park, MD, 28-31 July 2011.

49. "Miller's Experiments: A Relativistic Controversy," presented at the 23rd International Congress of History of Science and Technology, Budapest, 28 July-2 August 2009.

COMMITEES' MEMBERSHIP

1. Invited member of the Commission on Science, Technology and Diplomacy of the Division of History of Science and Technology of the International Union for the History and Philosophy of Science, since March 2019

2. Elected member of the Executive Committee of the Italian Society for the History of Physics and Astronomy, since February 2019.

3. Invited member of the Group for the History of Physics of the European Physical Society, since December 2018.

4. Elected member of the Scientific Board of the European Society for the History of Science, since September 2018.

5. Invited member of the Organizing Committee of the Physical Sciences Forum of the History of Science Society, since 2016.

PROFESSIONAL ACTIVITIES

1. Symposium co-organizer, "Visualizing the history of knowledge: Methods and epistemic implications of digital humanities' visual techniques" 9th Congress of the European Society for the History of Science, Bologna (virtual), 31 August-3 September 2020.

2. Symposium co-organizer, "The changing relation between visual representations and theoretical frameworks: visual tools in the history of physics and astronomy" 9th Congress of the European Society for the History of Science, Bologna (virtual), 31 August-3 September 2020.

3. Member of the scientific committee of the 9th Congress of the European Society for the History of Science, Bologna (virtual), 31 August-3 September 2020.

4. Member of the organizing committee of the 40th Congress of the Italian Society for the History of Physics and Astronomy (SISFA), virtual, 8-11 September 2020.

5. Co-organizer, seminar series "Science, Technology, and Diplomacy during the Cold War and Beyond," *Max Planck Institute for the History of Science*, Berlin, Germany, 8 meetings with about fifty participants.

6. Member of the Advisory Board of GRG Golden Oldies Series in the journal *General Relativity and Gravitation*, since February 2020.

7. Editorial board member, *Human and Social Sciences Communications* (formerly *Palgrave Communications*), since December 2019.

8. Workshop co-organizer, "Diplomats in science diplomacy: Promoting scientific and technological collaboration in international relations. First workshop of the Commission on Science, technology, and Diplomacy of the Division of History of Science and Technology of the International Union for the History and philosophy of Science, Copenhagen 19-20 July 2019.

9. Session co-organizer, "Institutionalizing scientific internationalism? Diplomacy at work in the physical sciences during the Cold War and beyond." 2018 History of Science Society Annual Meeting, Seattle, 1-4 November 2018.

10. Symposium Co-organizer, "Enduring Ideas, New Alliances: Social and Epistemic Factors in the Renaissance of General Relativity," 7th Congress of the European Society for the History of Science, Prague, 22-24 September 2016.

11. Conference Co-Organizer, "Opening New Windows on the Cosmos: Astronomy and Astrophysics in the History of the Max Planck Society," Berlin, 6-8 September 2016.

12. Conference Co-Organizer, "Centenary Conference on the History of General Relativity," Berlin, 2-5 December 2015.

13. Session Co-Organizer, "Back with a Flourish: Social and epistemic factors in the postwar Renaissance of General Relativity," 2015 History of Science Society Annual Meeting, San Francisco, November 2015.

14. Workshop Co-organizer, Harvard-MIT-Princeton Workshop in the History of the Physical Sciences, Harvard University, April 2013.

15. Working group Organizer, MIT-STS Working Group on the History of Modern Physical Sciences, 2011-2013.

16. Referee for: Oxford University Press; Chicago University Press; World Scientific, *Science and Education*; *European Physical Journal H*; *American Journal of Physics*; *European Journal of Physics; Comptes Rendus, Nuncius*, *Cold War History; Centaurus*; *Historical Studies in the Natural Sciences*;

Studies in the History and Philosophy of Modern Physics; *Notes and Records: the Royal Society Journal of the History of Science*.

OUTREACH ACTIVITIES

Events

- Co-creator and speaker in "What if…? Alternative Histories of Science," Cambridge Science Festival in collaboration with MIT Museum and Harvard University, April 2012
- Creator and Director, "Eterefolli," play on the history of the wave-corpuscular debate in optics, Festival del Ticino, Italy, 2010.
- Co-organizer of more than fifty cultural events for the general public within the activities of the group theatre Comuna Baires in Milan, 1995-2005 (managing director between 2001 and 2005). These included academic books presentations as well as conferences of philosophers, anthropologists, sociologists (including Prof. Carlo Sini, Prof. Giulio Giorello, Prof. Francesco Remotti, Prof. Elio Franzini, Prof. Paolo Spinicci, and many others)

Publications

- "The Foundation of the EPS: A case of science diplomacy." *SIF PrimaPagina*, July 2020, https://www.primapagina.sif.it/article/1152/the-foundation-of-the-eps-a-case-of-science-diplomacy#.XyOlPR1S_E4
- "Early Editorial Practices at The Physical Review." *APS News* 27 (2018): 7-8 [OA]
- (with Alexander Blum, Luisa Bonolis and Jürgen Renn) "La Relatività dopo la Guerra." *Le Scienze: Edizione italiana di Scientific American*, 567 (2015): 48-53.
- "Reduction versus Emergence in Theoretical Physics." *Occulto Magazine, issue delta* (2015).
- (with Jürgen Renn) "Tutto Albert nella rete." *Il sole 24 ore*, Sunday Cultural Insert, 4 January 2015.
- "The Dark Side of the Relativity Revolution – A Brief Trip through the History of the Anti-Relativity Movement." *Occulto Magazine, issue pi,* (2014): 18-33.

MUSEUM ACTIVITIES

Participation to the activities of the Museum of the Astronomical Observatory of Brera, Milan (2008-2011) [assistance in the organizational activity, catalogue, visits to the collection of the museum, and special events]

DIGITAL SKILLS

- Proficient: software packages and applications for network visualization and analysis (Citespace, Cytoscape, Gephi, muxViz, Palladio, Visone, VOSviewer), Optical Character Recognition Software (Abbyy), Office Suite, Filemaker, Zotero, Voyant Tools, Microsoft Office.
- Good familiarity with the programming languages R (considerable experience with the packages related to topic modeling, network visualization and analysis, statistical modeling of networks, and longitudinal networks including ggplot2, mallet, igraph, sna, network, Statnet, RSiena), Python (especially the packages NetworkX and igraph).
- Working experience with the OS X Bash Command Line, QGIS, Wget, Regular Expressions, SerendipSlim, and SPARQL.

MEMBERSHIP IN PROFESSIONAL ORGANISATIONS

European Physical Society (EPS)
European Society for the History of Science (ESHS)
History of Science Society (HSS)

Italian Physical Society (SIF)
Italian Society for the History of Physics and Astronomy (SISFA)
Italian Society for the History of Science (SISS)

LANGUAGE SKILLS

Italian: Mother tongue
English: Fluent
German: B2 knowledge
French: Reading knowledge
Spanish: Reading knowledge