

# Luisa Bonolis

## Curriculum Vitae

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### Education and Qualifications

- 2018 Scientific Habilitation in History of Physics for the role of Associate Professor from the Italian Ministry of Education, University and Research
- 2009 Ph.D. in History of Science (with distinction). Title of dissertation:  
*Bruno Rossi and Cosmic Rays: From Earth Laboratories to Physics in Space*
- 2006 Ph.D. Scholarship, History of Sciences, Seminario di Storia della Scienza, Bari University, Italy
- 1994 Post graduate specialization diploma in Physics, Sapienza University, Rome, Italy
- 1993 Master Degree in Physics, Rome University Sapienza

### Language Skills

Italian: Mother tongue

English: Fluent

German: Working knowledge

French: Proficient

Spanish: Working knowledge

### Professional and research experience

1993–1995 Editor for book publishers Shakespeare & Company Futura, Florence.

1996–2002 Collaboration with the Society for Oral History on a project funded by the National Research Council regarding the realization of a series of oral history interviews to leading figures of the 20th century Italian physics to be preserved at the National State Archive.

1996–2003 Scientific Consultant and collaborator at Quadrofilm Company for the realization of a series of documentaries on the history of science, produced for RAI Italian Television.

2000–2002 Contract with the Physics Department of Rome University La Sapienza and the Rome branch of the National Institute for Nuclear Physics: research activities and collaboration with the National Committee and with the executive Council for the celebrations of Enrico Fermi's birth centennial.

2002–2013 Scientific editor and contributor to the journal *Sapere*.

2003–to–date Collaboration with the Italian Association for Physics Teaching (AIF) at a project aiming at integrating teaching and history of physics.

2004–2005 Contract with the Physics Department of Rome University Sapienza and the Rome branch of the National Institute for Nuclear Physics on research activities concerning the project "From cosmic-ray researches to the rise and development of Frascati National Laboratories, and the collaboration with CERN" (National Institute for Nuclear Physics and Italian Ministry for University and Research - MIUR - co-financed project).

2006–2007 Collaboration with the Physics Department of Rome University Sapienza on research activities regarding the project "Nuclear and subnuclear Physics in Italy from the 1930s to the 1970s: from cosmic rays to accelerators" (National Institute for Nuclear Physics and Italian Ministry for University and Research co-financed project).

2007 (July) Visiting scholar at Kavli Institute for Astrophysics (MIT), Cambridge MA.

2009 October. Research scholar at Interdisciplinary Laboratory for Natural and Human Sciences, International School for Advanced Studies (SISSA), Trieste.

2010 (July–August) Research scholar at Interdisciplinary Laboratory for Natural and Human Sciences, International School for Advanced Studies (SISSA), Trieste

2011 (January–July) Fellowship at Munich Center for the History of Science and Technology, Deutsches Museum, Munich.

2011 (August) Research scholar at Interdisciplinary Laboratory for Natural and Human Sciences, International School for Advanced Studies (SISSA), Trieste.

2013 (October–November) Grant of the Physics Department of Rome University Sapienza on research activities regarding the project “The life and sciences of Bruno Pontecorvo”.

1 March 2013–30 May 2016 Research scholar at Max Planck Institute for the History of Science, Berlin.

1 June 2016–30 May 2018 Fellowship at Max-Planck-Institute for the History of Science. Research Program “History of the Max Planck Society”.

1 June 2018–30 January 2018 Visiting scholar at Max-Planck-Institute for the History of Science. Research Program “History of the Max Planck Society”.

1 February 2019–30 June 2019 Visiting scholar at Max-Planck-Institute for the History of Science. Research Program “History of the Max Planck Society”.

1 August 2019–31 July 2021 Visiting scholar at the Max Planck Institute for the History of Science, Berlin.

1 August 2021–31 July 2023 Visiting scholar at the Max Planck Institute for the History of Science, Berlin.

## Memberships

2013–to–date Member of the Board of Editors of *The European Physical Journal H*

European Astronomical Society

European Physical Society

Italian Physical Society

Italian Society for the History of Physics and Astronomy (SISFA)

## Teaching

2001–2004 Lessons on 19th and 20th century history of mathematics and physics within the course “Mathematical methods for physics” held by prof. Carlo Bernardini, Department of Physics, Rome University Sapienza.

2003–2018 Courses at the annual Winter School on History of Physics organized by the Italian Association for Physics Teaching (A.I.F.). Titles of the courses:

*The coming of abstract mathematics in the physics of 20th century* (2003); *Pauli and the mysteries of  $\beta$ -decay, Fermi’s theory of  $\beta$ -decay* (2004); *Enrico Fermi and the Roman Physics School, Bruno Rossi and the electromagnetic cascade* (2005); *Einstein, Jordan, Dirac and the origins of QED* (2006); *Neutrinos. A history of puzzles and paradoxes* (2007); *From Mendel’s laws to the discovery of the structure of DNA double helix* (2008); *The motion of Planets: order or chaos? The three-body problem, a challenge for celestial mechanics* (2009); *Physicists and Mathematicians in Göttingen. Amalie Emmy Noether and the birth of super-laws* (2009); *Lords of the cosmic rays: from earth laboratories to physics in space. A century of cosmic ray researches* (2010); *Physics and Group Theory. From Evariste Galois to Emmy Noether. From Noether’s Theorems to the “Gruppenpest” in the new Quantum Mechanics* (2013); *Stars and cosmos as laboratories for fundamental physics* (2018).

2006 Ettore Majorana's physics (lessons at Specialization School for Secondary Teaching, SISS, Potenza).

2006–2007 Courses at University of Basilicata, Potenza, History of Physics, Didactics of Physics and Laboratory.

2007–2008 Course at University of Basilicata, Potenza, History of Physics.

2008–2009 Courses at University of Basilicata, Potenza, History of Physics, Didactics of Physics and Laboratory.

### Research activity

Between 1996 to present, has conducted long oral history interviews with leading figures of the XX century Italian physics within research projects financed by National Research Council, Italian Ministry for University and Research and the Physics Department of Pisa University.

Many of these interviews have been prepared for publication and are featured in the volumes *Fisici italiani del tempo presente. Storia di vita e di pensiero* (edited by L. B. and M. G. Melchionni, 11 authors, Marsilio, Venice, 2003, pp. 457); *Maestri e allievi nella fisica italiana del Novecento* (edited by L. B., 20 authors, Pavia 2008, pp. 650); *Storie di uomini e quarks* (edited by C. Bemporad and L. B., 8 authors, pp. 245, Società Italiana di Fisica, 2012).

A special series of oral history interviews regarding the birth of electron-positron colliders in Frascati National Laboratories near Rome was collected to be used in part in the documentary film *Bruno Touschek and the Art of Physics* (L. B. with director Enrico Agapito).

In the period 2009-2010 has been involved in collecting testimonies from physicists who have worked or are still active in different scientific institutions in Trieste (Physics Department of Trieste University, International School for Advanced Studies, International Center for Theoretical Physics).

During the period 2001-2009 has worked at retrieving and depositing in Italian archives personal papers and manuscripts of Italian physicists who operated during the period 1930s to 1970s (Giovanni Polvani and Carlo Salvetti). Has collected in particular books and papers which belonged to Giovanni Gentile Jr. (son of the well known philosopher Giovanni Gentile), has prepared a complete catalogue with Tommaso Figliuzzi and deposited all the material in the Archive of the Physics Department of Rome University Sapienza.

Particularly interested in increasing the knowledge about the role of Italian physics in the scientific culture and history of the 20th century has always worked in the direction of reconstructing the scientific activity of the Italian physicists community since the 1920s; in this connection has written essays on the scientific work of outstanding personalities such as Enrico Fermi, Bruno Rossi, Giovanni Gentile Jr, Ettore Majorana, Bruno Pontecorvo, Bruno Touschek, Edoardo Amaldi, Enrico Persico.

The research work underlying the Ph.D. dissertation (*Bruno Rossi and Cosmic Rays: from Earth Laboratories to Physics in Space*) was focused on a very detailed reconstruction and analysis of Bruno Rossi's scientific work during the period spanning from the end of 1920s to the beginning of 1960s. This outline has especially focused on the development of the strong interdisciplinary, evolutive and creative character of cosmic-ray research, which Rossi himself contributed to shape in the articulated and open form we know today. The research was mainly based on Bruno Rossi Papers preserved in the Archives of the Massachusetts Institute of Technology. Has authored several papers and essays focusing on different issues of Rossi's scientific activity.

Since 2003 is involved in a project aiming at integrating the history of physics into the teaching of physics in secondary school carried on by the Italian Association for Physics Teaching (AIF). Part of this project is the annual winter school held in different Italian towns to which L.B. has participated holding lessons on the history of 20th century physics.

In the period 2009–2010 has collaborated with the International School for Advanced Studies (SIS-

SA) and with the International Center for Theoretical Physics in Trieste (ICTP) to a research project on the Pakistani physicist Abdus Salam, founder of ICTP, which has included the realization of *Abdus Salam. The dream of Symmetry*, a documentary film on the life and science of the Pakistani physicist.

During the period 2010–2014 has researched on aspects of the history of internationalism of physics during the 20th century and has reconstructed the birth and early years of fusion research in Italy.

The research project carried out at Deutsches Museum Archives in Munich during the period January-June 2011 was focused on Arnold Sommerfeld's correspondence and his relationships with Italian scientists.

Since 2004 is working with Giulia Pancheri of Frascati National Laboratories at a project concerning the life and sciences of Bruno Touschek, in connection with the early history of accelerators in Europe and the developments of electron-positron colliders during the 1960s.

At the Max Planck Institute for the History of Science in Berlin has been involved during 2015–2016 in the research project on the “Renaissance of General Relativity” with a research on the emergence of Relativistic Astrophysics during the 1950s and early 1960s.

From June 2016 to June 2019 has worked within the Program “History of the Max-Planck-Society” with a project on the History of Astrophysics, Astronomy, Cosmology and Space Sciences in the Max Planck Society, and in collaboration with Juan-Andres Leon has completed a book resulting from such research to be published by Brill in 2022.

Currently is guest scholar at the Max Planck Institute for the History of Science, Berlin, with a project on the emergence of Astro-Particle Physics.

## Awards

Prize 2011 for the History of Physics of the Italian Physical Society.

Prize 2011 for the History of Physics awarded by “Fondazione Edoardo Amaldi”, the Physics Department of Rome University Sapienza and the Italian Association for the Teaching of Physics.

## Publications

### Books

*The Legacy of Bruno Pontecorvo: the Man and the Scientist* (editor with C. Dionisi and N. Robotti) SIF Conference Proceedings (Società Italiana di Fisica, Bologna 2014, pp. 194)

*Prometheus' dream. The birth of fusion research in Italy* (In Italian. Barbieri Selvaggi Editori, 2012, pp. 241)

*Histories of Men and Quarks*, a collection of 8 oral history interviews conducted by L. B. (editor with C. Bemporad) (In Italian. Società Italiana di Fisica, 2011, pp. 245)

*Masters and Pupils in the Italian Physics of the 20th Century* (ed.), a collection of oral history interviews and personal recollections, 20 authors (In Italian. Pavia 2008, pp. 650)

Editor of the Italian version of the volume by F. Balibar, *Einstein 1905. From ether to quanta* (Kami, 2005, pp. 172)

*Enrico Fermi: his work and legacy* (editor with C. Bernardini) (Società Italiana di Fisica & Springer Verlag, 2004), English translation of *Conoscere Fermi*, a selection of essays on Enrico Fermi's scientific work published by the Società Italiana di Fisica on the occasion of Fermi's birth centennial (Editrice Compositori, 2001, Bologna, pp. 383)

*Contemporary Italian physicists. Stories of life and thought*, collection of 11 oral history interviews conducted by L. B. (editor with M. G. Melchionni) (In Italian. Marsilio, Venezia, 2003, pp. 462)

*Ettore Majorana. The vanished genius*, series Masters of science (*Le Scienze*, Milan, June 2002, pp. 112)

Has edited lectures of the course *Epistemology and history of physics*, completed with notes, bibliography and a selection of original texts (1998-1999, prof. M. De Maria, Department of Physics, Rome University Sapienza)

Has been a member of the board of directors of the Encyclopedia *Storia dell'Editoria d'Europa*, in particular coordinating the production of the second volume dedicated to Italy (Shakespeare & Company Futura, 1995, pp. 885, 70 authors)

#### Refereed research papers

The Frascati National Laboratories. Past and Future (with Fabio Bossi and Giulia Pancheri). *Il Nuovo Saggiatore* 37 (3-4)(2021) 47–60.

<https://www.ilnuovosaggiatore.sif.it/issue/65>.

A Tale of Two Scientists and the Development of Particle Colliders (with Giulia Pancheri). *Viewpoint* 118 (2019) 7-9

[http://www.bshs.org.uk/wp-content/uploads/Viewpoint\\_118\\_Web.pdf](http://www.bshs.org.uk/wp-content/uploads/Viewpoint_118_Web.pdf)

The Charm of Theoretical Physics (1958–1993). Oral history interview with Luciano Maiani, *European Physical Journal H* 42 (2017) 611–661

<https://doi.org/10.1140/epjh/e2017-80040-9>

The LHC timeline: a personal recollection (1980–2012), Oral history interview with Luciano Maiani, *European Physical Journal H* 42 (2017) 475–505

<https://doi.org/10.1140/epjh/e2017-80052-8>

Stellar structure and compact objects before 1940: Towards relativistic astrophysics. In: topical issue *The Renaissance of Einstein's Theory of Gravitation*, *European Physical Journal H* 42 (2017) 311–393

<https://doi.org/10.1140/epjh/e2017-80014-4>

A life in statistical mechanics. Part 1: From Chedar in Taceva to Yeshiva University in New York. Oral history interview with Joel L. Lebowitz, *European Physical Journal H* 42 (2017) 1–21

<https://doi.org/10.1140/epjh/e2017-80006-9>

The beginnings of theoretical condensed matter physics in Rome: a personal remembrance. Oral history interview with Carlo Di Castro, *European Physical Journal H* 39 (2014) 3–36

<https://doi.org/10.1140/epjh/e2013-40043-5>

International scientific cooperation during the 1930s. Bruno Rossi and the development of the status of cosmic rays into a branch of physics, *Annals of Science* 71(3) (2014) 355–409

<https://doi.org/10.1080/00033790.2013.827074>

From cosmic ray physics to cosmic-ray astronomy: Bruno Rossi and the opening of new windows on the universe, *Astroparticle Physics* 53 (2014) 67–85

<https://doi.org/10.1016/j.astropartphys.2013.05.008>

Simmetrie e principi di invarianza in fisica. Il ruolo della teoria dei gruppi, *La Fisica nella Scuola* XLVI(3) (2013) 96–111

Book Review: *Elementary Particles* by Enrico Fermi, *American Journal of Physics* 81 (5) (2013) 397–397

<http://dx.doi.org/10.1119/1.4790806>

Massimilla Baldo Ceolin, (with M. Friedlander), *Physics Today* 65(8) (2012) 60

<http://dx.doi.org/10.1063/PT.3.1686>

Lords of the cosmic-rays. From Earth laboratories to physics in space (in Italian), *La Fisica nella Scuola*, Quaderno 22 (2011) 67–87

Walther Bothe and Bruno Rossi: The birth and development of coincidence methods in cosmic-ray physics, *American Journal of Physics* 79(11) (2011) 1133–1150

<http://dx.doi.org/10.1119/1.3619808>

Bruno Touschek: particle physicist and father of the  $e^+e^-$  collider, (with G. Pancheri), *European*

*Physical Journal H* 36(1) (2011) 1–61

<http://dx.doi.org/10.1140/epjh/e2011-10044-1>

Bruno Rossi and the Racist Laws of Fascist Italy, *Physics in Perspective* 13 (2011) 58–90

<https://doi.org/10.1007/s00016-010-0035-4>

The birth and development of research on plasmas and nuclear fusion in Italy (in Italian) (with F. Magistrelli), MIT (LNS) Report HEP 11/01 (December 15, 2010) and *Analysis* 3-4 (2010) 27–44

[http://www.analysis-online.net/wp-content/uploads/2013/03/bonolis\\_magistrelli\\_fusione.pdf](http://www.analysis-online.net/wp-content/uploads/2013/03/bonolis_magistrelli_fusione.pdf)

Physicists and Mathematicians in Göttingen. Amalie Emmy Noether and the birth of super-laws: symmetries and invariances (in Italian), *La Fisica nella Scuola*, Quaderno 21 (2009) 52–67

The motion of Planets: order or chaos? The three-body problem, a challenge for celestial mechanics (in Italian), *La Fisica nella Scuola*, Quaderno 21 (2009) 12–36

Book Review. F. Guerra e N. Robotti, Ettore Majorana. Aspects of his Scientific and Academic Activity, *Nuncius. Journal of the History of Science* 2 (2009) 555–556

Bruno Touschek and the Birth of Electron-Positron Collisions (with G. Pancheri), *International Newsletter. Forum on International Physics – The American Physical Society* (December 31 2009) 16–18

<https://www.aps.org/units/fip/newsletters/upload/dec09.pdf>

The origins of Quantum Electrodynamics from Einstein to Jordan and Dirac (in Italian), *La Fisica nella Scuola*, Quaderno 19 (2009) 1–43

Bruno Touschek vs Machine Builders. AdA, the first matter-antimatter collider, *La Rivista del Nuovo Cimento* 28 (11) (2005) 1–60

<https://doi.org/10.1393/ncr/i2005-10006-x>

Prelude to the bomb. From the discovery of X rays to the discovery of fission (in Italian), *La Fisica nella Scuola*, Quaderno 17 (2005) 120-136

Wolfgang Pauli, Enrico Fermi and the mysteries of beta decay (in Italian), *La Fisica nella Scuola*, Quaderno 17 (2005) 100–119

The coming of abstract mathematics in the 20th century theoretical physics (in Italian), *La Fisica nella Scuola*, Quaderno 17 (2005) 120–136

Bruno Pontecorvo, from slow neutrons to oscillating neutrinos, *American Journal of Physics* 73 (2005) 487–499

<http://dx.doi.org/10.1119/1.1852540>

From the Rise of the Group Concept to the Stormy Onset of Group Theory in the New Quantum Mechanics. A saga of the invariant characterization of physical objects, events and theories, *La Rivista del Nuovo Cimento* 27 (4-5) (2004) 1-110

<https://doi.org/10.1393/ncr/i2004-10006-4>

Enrico Fermi and the sciences of the earth (with C. Bernardini), *Italian Journal of Engineering Geology and Environment* 2 (2003) 6

Giovannino Gentile, sixty years later (with C. Bernardini), *Il Nuovo Saggiatore* 18 (1-2) (2002) 7–13

### Book chapters

[Gravitational-Wave Research as an Emerging Field in the Max Planck Society: The Long Roots of GEO600 and of the Albert Einstein Institute](#) (with Juan-Andres Leon), in A. Blum, R. Lalli, J. Renn (eds.) *The Renaissance of General Relativity in Context*, Einstein Studies, vol 16, (Birkäuser, Cham, 2020), 285-361

[Touschek, Bruno](#) (with Giulia Pancheri), in *Dizionario Biografico degli Italiani*, Istituto della Enciclopedia Italiana, Vol. 96, 2019

[Rossi, Bruno Benedetto](#), in *Dizionario Biografico degli Italiani*, Istituto della Enciclopedia Italiana, Vol. 88, 2017

Bruno Rossi and Domenico Pacini, the pioneers of cosmic rays in Italy (in Italian), in M. Cattaneo (ed.), *150 years of science in Italy*, (Codice 2011) 143–156

Leonardo Sinisgalli and the guys from via Panisperna (in Italian) (with D. Cocolicchio and B. Russo), in G. I. Bischi e P. Nastasi (eds.), *Un “Leonardo” del Novecento: Leonardo Sinisgalli (1908-1981)*, *PriSTEM/Storia* 23-24 (2009) 1–60

Bruno Touschek and the genesis of an idea: AdA, the first storage ring for electrons and positrons, in M. Leone et al. (eds.) *Fermi’s and Majorana’s Legacy and other issues* (Bibliopolis, 2007) 217–222

Hermann Weyl, Ettore Majorana, Bruno Pontecorvo, in M. Leone et al. (eds.) *Fermi’s and Majorana’s Legacy and other issues* (Bibliopolis, 2007) 171–176

1904. One year before Einstein: The Conference of Sciences and Arts in St. Louis (in Italian), in F. Balibar, *Einstein 1905. From ether to quanta*, edited by L. B. (Kami, 2005) 117–157

Group Theory in Physics (in Italian), in E. Bellone (ed.), *Encyclopaedia La Scienza*, Vol. 14 (UTET, 2005) 263–291

Enrico Fermi’s scientific work. A chronological analysis, in C. Bernardini and L. Bonolis (eds.), *Enrico Fermi, his work and legacy* (Società Italiana di Fisica and Springer Verlag, 2004) 314–393

History of publishing houses: Umberto Allemandi, Anabasi, Edizioni Scientifiche Italiane, Gremese, Guanda, Il Pensiero Scientifico, Istituto della Enciclopedia Italiana, Jaca Book, Muzzio, Piemme, UTET, in: *Storia dell’Editoria d’Europa*, vol. II (Shakespeare & Company Futura, 1995, pages 885)

#### Papers in Conference Proceedings

Thinking Big: How Large-scale Detectors Set the Stage for the Emergence of Astro-particle Physics. A Short Survey (with Juan Andres Leon). In: F. Bevilacqua and I. Garbaro (eds.) *Atti del XL Convegno SISFA – 2020. Online, 8-10 September 2020*. Pisa, Pisa University Press 2021, 171–177. ISBN: 978-883339-5173. doi:10.12871/978883339517320

How relativistic astrophysics bubbled up from post-WWII science. A preliminary survey. In: A. La Rana and P. Rossi (eds.) *Atti del XXXIX Convegno annuale, Proceedings of the 39th Annual Conference ; Pisa, 9-12 Settembre 2019; Società Italiana degli Storici della Fisica e dell’Astronomia (SISFA)*. Pisa University Press, Pisa, 2020, 159–170. ISBN: 9788833394022. doi: 10.12871/97888333940225

The beginning of Edoardo Amaldi’s interest in gravitation experiments and in gravitational wave detection (with A La Rana). In: M. Bianchi, RT. Jantzen, R. Ruffini (eds.) *On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics, and Relativistic Field Theories. Proceedings of the MG14 Meeting on General Relativity University of Rome “La Sapienza”, Italy, 12-18 July 2015*. World Scientific, Singapore (2017) 3378–3383 ISBN: 9789813226593, doi: 10.1142/10614

The Renaissance of General Relativity in Rome: Main Actors, Research Programs and Institutional Structures (with R. Lalli and A. La Rana). In: *On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics, and Relativistic Field Theories. Proceedings of the MG14 Meeting on General Relativity University of Rome “La Sapienza”, Italy, 12–18 July 2015*. Edited by M. Bianchi, R. T. Jantzen, R. Ruffini. World Scientific, Singapore (2017) 3372–3377, ISBN: 9789813226593, doi:10.1142/9789813226609\_0433

Birth of colliding beams in Europe, two photon studies at Adone (with G. Pancheri), to be published in *Journal of Physics: Conference Series*, Proceedings of PHOTON 2015: International Conference on the Structure and the Interactions of the Photon, Novosibirsk, Russia, 15–19 June, 2015. <http://arxiv.org/abs/1511.00453>

Unraveling the Nature of Cosmic Rays. Bruno Rossi and the Spread and Developments of Experimental Practices and Scientific Collaborations in Cosmic-Ray Physics before World War II, in A. Roca-Rosel (ed), *Proceedings of the 4th International Conference of the European Society for the History of Science, Barcelona, 18-20 November 2010*, 799–804 <http://taller.iec.cat/4iceshs/documentacio/P4ESHS.pdf>

First hints of electromagnetic showers in Bruno Rossi's notebooks, in E. Giannetto, G. Giannini, D. Capecchi, R. Pisano (eds), *Da Archimede a Majorana: la fisica nel suo divenire*, Quaderni del CE.R.CO. 4 (Guaraldi 2009) 339–350

At the origins of space physics, in E. Giannetto, G. Giannini, M. Toscano (eds.), *Relatività, Quanti, Chaos e altre Rivoluzioni della Fisica. Atti del XXVII Congresso Nazionale di Storia della Fisica e dell'Astronomia, Bergamo 2007* (Guaraldi 2010) 351–356

The Nobel Prizes 2004 for Physics and the theory of asymptotic freedom for strong interactions (in Italian, with D. Cocolicchio), *Proceedings of the XXV National Congress on the History of Physics and Astronomy*, (Milano, SISFA 2008) C04.1–C04.7

<http://www.brera.unimi.it/sisfa/atti/atti2005/c04-bonolis-cocolicchio.pdf>

Giovanni Gentile Jr at Milan University, *Proceedings of the XXV National Congress on the History of Physics and Astronomy*, (Milano, SISFA 2008) C03.1–C03.6

<http://www.brera.unimi.it/sisfa/atti/atti2005/c03-bonolis.pdf>

Similitude, homogeneity and physical dimensions: the Buckingham theorem (in Italian), in M. Fasano e R. Grande (eds.), *Proceedings of the IV National Meeting on Mathematics, scientific education and new technologies*, (Editrice Ermes, 2007) 5–15

Giovanni Gentile and Ettore Majorana. The appearance of group theory in Italian theoretical physics, in N. Robotti, A. Paoletti, M. Leone, P. Tucci (eds.), *Proceedings of the XII National Congress of History of Physics and Astronomy (Genova-Chiavari - 6/8 June 2002)* (Italian Institute of Philosophical Studies, Naples, 2004) 117–235

#### Preprints & Reports

Bruno Touschek Remembered. 1921-2021. Bibliography and Sources, 11 December 2021.

[arxiv:2111.00625](https://arxiv.org/abs/2111.00625)

Gravitational-wave research as an emerging field in the Max Planck Society. The long roots of GEO600 and of the Albert Einstein Institute (with Juan Andres Leon), 29 October 2020.

[arXiv:2003.00941](https://arxiv.org/abs/2003.00941)

Bruno Touschek in Glasgow. The making of a theoretical physicist (with Giulia Pancheri), 11 May 2020. [arXiv:2005.04942](https://arxiv.org/abs/2005.04942)

Bruno Touschek in Germany after the War: 1945-46 (with Giulia Pancheri), 20 October 2019. Report INFN - 19-17/LNF, Istituto Nazionale di Fisica Nucleare, Laboratori Nazionali di Frascati, and MIT-CTP/5150, 10 October, 2019. [arXiv:1910.09075](https://arxiv.org/abs/1910.09075)

Touschek with AdA in Orsay and the first direct observation of electron-positron collisions (with Giulia Pancheri), 31 December, 2018. [arXiv:1812.11847](https://arxiv.org/abs/1812.11847). Report INFN - 18-12/LNF, Istituto Nazionale di Fisica Nucleare, Laboratori Nazionali di Frascati, December 31, 2018

Bruno Touschek and AdA: from Frascati to Orsay. In memory of Bruno Touschek, who passed away 40 years ago, on May 25th, 1978 (with Giulia Pancheri), 23 May, 2018. [arXiv:1805.09434](https://arxiv.org/abs/1805.09434). Report INFN - 18-05/LNF, Istituto Nazionale di Fisica Nucleare, Laboratori Nazionali di Frascati, May 25, 2018

The path to high-energy electron-positron colliders: from Widerøe's betatron to Touschek's AdA and to LEP (with Giulia Pancheri), 24 October, 2017. [arXiv:1710.09003](https://arxiv.org/abs/1710.09003)

Bruno Rossi and Cosmic Rays: From Earth laboratories to Physics in Space, 27 October, 2011.

[arXiv:1110.6206](https://arxiv.org/abs/1110.6206)

**Lindau Nobel Laureate Meetings. Mediateque. Research profiles of Nobel Laureates**

Alfvén, Hannes Olof Gösta – Nobel Prize in Physics 1970  
Blackett, Patrick Maynard Stuart – Nobel Prize in Physics 1948  
Bloch, Felix – Nobel Prize in Physics 1952  
Bragg, William Lawrence – Nobel Prize in Physics 1915  
Chandrasekhar, Subramanyan – Nobel Prize in Physics 1983  
Cockcroft, John – Nobel Prize in Physics 1951  
Crick, Francis Harry Compton – Nobel Prize in Physiology or Medicine 1962  
Crutzen, Paul Jozef – Nobel Prize in Chemistry 1995  
Curl, Robert Floyd Jr. – Nobel Prize in Chemistry 1996  
Ernst, Richard Robert – Nobel Prize in Chemistry 1991  
Giacconi, Riccardo – Nobel Prize in Physics 2002  
Goeppert-Mayer, Maria – Nobel Prize in Physics 1963  
Hahn, Otto – Nobel Prize in Chemistry 1944  
Hevesy, George Carl – Nobel Prize in Chemistry 1943  
Hewish, Anthony - Nobel Prize in Chemistry – Nobel Prize in Physics 1974  
Hodgkin, Dorothy Crowfoot – Nobel Prize in Chemistry 1964  
Hofstadter, Robert – Nobel Prize in Physics 1961  
Jensen, Johannes Hans Daniel – Nobel Prize in Physics 1963  
Joliot, Frédéric – Nobel Prize in Chemistry 1935  
Joliot Curie, Irène – Nobel Prize in Chemistry 1935  
Kapitza, Pyotr Leonidovich – Nobel Prize in Physics 1978  
Kendrew, John Cowdery – Nobel Prize in Chemistry 1962  
Klug, Aaron – Nobel Prize in Chemistry 1982  
Koshiba, Masatoshi – Nobel Prize in Physics 2002  
Kroto, Harold W. – Nobel Prize in Chemistry 1996  
Laue, Max von – Nobel Prize in Physics 1914  
Libby, Willard Frank – Nobel Prize in Chemistry 1960  
McMillan, Edwin Mattison – Nobel Prize in Chemistry 1951  
Molina, Mario Jos – Nobel Prize in Chemistry 1995  
Paul, Wolfgang – Nobel Prize in Physics 1989  
Pauling, Linus Carl – Nobel Prize in Chemistry 1954  
Perutz, Max Ferdinand – Nobel Prize in Chemistry 1962  
Powell, Cecil Frank – Nobel Prize in Physics 1950  
Purcell, Edward Mills – Nobel Prize in Physics 1959  
Rabi, Isidor Isaac – Nobel Prize in Physics 1944  
Rowland, Frank Sherwood – Nobel Prize in Chemistry 1995  
Segrè, Emilio Gino – Nobel Prize in Physics 1959

Soddy, Frederick – Nobel Prize in Chemistry 1921

Stern, Otto – Nobel Prize in Chemistry 1943

Thomson, George Paget – Nobel Prize in Physics 1937

Urey, Harold Clayton – Nobel Prize in Chemistry 1934

Walton, Ernest Thomas Sinton – Nobel Prize in Physics 1951

Watson, James Dewey – Nobel Prize in Physiology or Medicine 1962

Wilkins, Maurice Hugh Frederick – Nobel Prize in Physiology or Medicine 1962

Yalow, Rosalyn Sussman – Nobel Prize in Physiology or Medicine 1977

### Invited talks

Fermi and the nuclear energy. Genova University, Department of Physics, November 2001.

Fermi and the Roman school. ISPRA Research Centre, Ispra, March 2002.

History and role of abstract mathematics in theoretical physics from XIX to XX century. Domus Galilaeana, Pisa, October 2003.

Fermi and the Chicago pile, introductory seminar (with F. Guerra) to the docu-film *Enrico Fermi* “On the discovery of radioactivity induced by  $\alpha$ -particles – Joliot-Curie – and by neutrons – Fermi”. Rome University Sapienza, Department of Physics, May 2004.

Prelude to the bomb. From the discovery of X rays to the discovery of nuclear fission. XLIII National Congress of the Association for Physics Teaching, Salice Terme, October 2004.

Ettore Majorana, introductory seminar to the documentary film Hypothesis on the disappearance of an atomic physicist. University of Basilicata, Potenza, May 2005.

Similitudine, omogeneità e dimensioni fisiche: il teorema di Buckingham. IV National Meeting Mathematics, scientific education and new technologies, Macchia di Ferrandina (Mt) 9-10 December 2005.

Giovanni Gentile Jr.: Physics in the 1930s. *Workshop Giovanni Gentile Jr: Physics and Culture in the 1930s*, Domus Galilaeana, Pisa, December 16, 2005.

Celebrations for the centennial of Ettore Majorana’s birth (with G. Maltese and A. Mastroianni), Auditorium Parco della Musica, Rome, March 4, 2006.

Ettore Majorana: from the myth to the history of physics. Mathematics Department, University of Basilicata, Potenza, March 28, 2006.

Leading Italian Physicists. Physics Department, Modena, December 2, 2006.

Ettore Majorana and the physics of the 1920s and 1930s. Conference *The Scientific Legacy of Ettore Majorana*, Physics Department, Sapienza University, Rome, December 7, 2006.

Bruno Pontecorvo, a great precursor. Applied General Physics Institute, Milan, May 3, 2007.

The birth of a new physics: Bruno Touschek and the time-like channel. XCIV National Congress of the Italian Physical Society, Genova, 22-27 September, 2008. Physics in Italy during the XX Century, Polo Universitario, Grosseto, October 28, 2008.

Cosmic Rays and Particles in the 1930s. The Arcetri school and Bruno Rossi’s scientific legacy. Pristem Conference on *Science and Scientists of unified Italy*, Riccione, 11-13 September, 2009.

Lords of the cosmic rays. Bruno Rossi and the opening of new technological windows. International School for Advanced Studies (SISSA), Trieste, October 7, 2009.

Bruno Rossi and Cosmic Rays: From Earth Laboratories to Physics in Space. Physics Department, Sapienza University, Rome, March 3, 2010.

Ettore Majorana and the mainstream of Physics in his time. International Meeting *Majorana's secret. From Science to Legend and back to Science*, Istituto Veneto di Scienze Lettere e Arti, Venice, March 17-18, 2010.

Giovannino Gentile, Meeting *Physics in Italian Society. School reforms and scientific teaching. The Role and Contribution of Scientists*. Frascati National Laboratories, Frascati, May 20, 2010.

Unraveling the Nature of Cosmic Rays. Bruno Rossi and the Spread and Developments of Experimental Practices and Scientific Collaborations in Cosmic-Ray Physics before World War II, 4th International Conference of the European Society for the History of Science, Barcelona, 18-20 November 2010.

Physics and physicists in the XX century. Accademia di Belle Arti, Rome, December 10, 2010.

Arnold Sommerfeld's correspondence with Italian scientists. Center for the History of Science and Technology, Deutsches Museum, Munich, March 15, 2011.

Italian Physics at the re-conquest of excellence. From post-war reconstruction to the "boom" years. Conference *Mathematics in the history of unified Italy*, Bocconi University, Milan, April 8-10, Urbino, 2011.

Bruno Rossi and the first in situ observations of the solar wind. XCVII National Conference of the Italian Physical Society (SIF), L'Aquila 26-30 September 2011.

Italian Physics at the conquest of excellence. From Fermi's age to the construction of the National Laboratories. Liceo Volta-Fellini, Riccione, March 7, 2012.

Orso Mario Corbino. Circolo Unione, Augusta, April 4, 2012.

From Cosmic Ray Physics to Cosmic Ray Astronomy. Bruno Rossi and the Opening of New Windows on the Universe. Conference *100 Years Cosmic Rays*. Bad Saarow/Pieskow, 6-8 August 2012.

Bruno Pontecorvo. Universality of weak interactions and muon decay. XCIX National Conference of the Italian Physical Society (SIF), Trieste 23-27 September 2013.

Bruno Pontecorvo. The man and the scientist. Dipartimento di Scienze di Base e Applicate per l'Ingegneria (SBAI), Sapienza Università di Roma, December 6, 2013.

Bruno Maksimovic Pontecorvo. From slow neutrons with Enrico Fermi in Rome to neutrino oscillations in Dubna. DESY, Hamburg, January 14, 2014.

Bruno Maksimovic Pontecorvo. From slow neutrons with Enrico Fermi in Rome to neutrino oscillations in Dubna. DESY, Zeuthen, January 15, 2014.

The Renaissance of General Relativity in Rome: Main actors, research programs and institutional structures. *XIV Marcel Grossmann Meeting*, Rome, July 14, 2015.

From Dense Matter to Gravitational Collapse: Preparing the Emergence of Relativistic Astrophysics. History of Science Society Annual Meeting, S. Francisco, California, November 20, 2015.

From 'Dark Stars' to Gravitational Collapse within Einstein's Theory: The Emergence of Relativistic Astrophysics. Conference *A Century of General Relativity*, November 30 – December 2, 2015, Harnack House, Berlin.

From white dwarfs to Gravitational Collapse: The emergence of Relativistic Astrophysics. International Solvay Institutes, Bruxelles, December 8, 2015.

The Birth of Research in Plasmas and Nuclear Fusion in Italy. Workshop *Thermonuclear Fusion, Space Exploration and Frontier Research in Astrophysics: History and Obstacles*. Department of Astronautical, Electrical and Energy Engineering, Sapienza University, of Rome, March 2, 2016.

The Beginning and Early Evolution of Astrophysical Research at the Max-Planck Institutes. Aspects and Impacts of the 'Ludwig Biermann's Era'. *Workshop Opening New Windows on the cosmos: Astrophysics and Astronomy in the history of the Max Planck Society*, Max Planck Institute for the History of Science, Berlin, September 6-8, 2016.

The Emergence of Relativistic Astrophysics in the early 1960s. *Symposium Enduring Ideas, New Alliances: Social and Epistemic Factors in the Renaissance of General Relativity*, 7th European Society for the History of Science Conference, Prague, October 22, 2016.

The lead-up to first Texas Symposium and the emergence of relativistic astrophysics. *Symposium Relativity at 100*, European Week of Astronomy and Space Science (EWASS), Annual meeting of the European Astronomical Society, Prague 26-30 June, 2017.

Between general relativity and group theory: Aspects of the birth of Italian theoretical physics in the 1920s–1930s. *Conference Luigi Bianchi. Between Galois & Einstein*, École Normale Supérieure (Paris), Istituto Veneto di Scienze, Lettere e Arti, Venice 7-8 May, 2018.

The lead-up to first Texas Symposium and the emergence of relativistic astrophysics. XXXIX National Conference of the Italian Society of Historians of Physics and Astronomy (SISFA), EGO-VIRGO, Cascina (Pisa), 10 September, 2019.

Bruno Touschek (1921–1978). The path to electron-positron collisions. *Memorial Symposium Touschek 100*, Physics Department, Sapienza University of Rome, 2nd December 2021.

### Conference Presentations

Giovanni Gentile and Ettore Majorana: the coming of group theory in Italian theoretical physics. XXII National Conference of the Italian Society of Historians of Physics and Astronomy (SISFA), Genova-Chiavari - 6/8 June 2002.

La genesi di un'idea: Bruno Touschek e il primo collider materia-antimateria. XXIV National Conference of the Italian Society of Historians of Physics and Astronomy (SISFA), Napoli-Avellino 2004.

Hermann Weyl, Ettore Majorana, Bruno Pontecorvo. XXIV National Conference of the Italian Society of Historians of Physics and Astronomy (SISFA), Napoli-Avellino, 2004.

Giovanni Gentile Jr in Milan. XXV National Conference of the Italian Society of Historians of Physics and Astronomy (SISFA), Milano, 10-12 November 2005.

The Nobel Prizes 2004 for Physics and the theory of asymptotic freedom for strong interactions (with D. Cocolicchio). XXV National Conference of the Italian Society of Historians of Physics and Astronomy (SISFA), Milano, November 10-12, 2005.

Bruno Rossi and the first hints of electromagnetic showers. XXVI National Conference of the Italian Society of Historians of Physics and Astronomy (SISFA), Roma, June 2006.

Particles or Waves? Cosmic-Ray Physics at the Beginning of the 1930s: Bruno Rossi vs. Robert Millikan. 3rd International Conference of the European Society for the History of Science, Vienna, September 10-12, 2008.

Enrico Fermi and Bruno Rossi: Dialogues on Cosmic Rays. XCIV National Conference of the Italian Physical Society (SIF), Genova, 22-27 September, 2008.

Bruno Rossi and Cosmic Rays: From Earth Laboratories to Physics in Space. XCV National Conference of the Italian Society of Historians of Physics and Astronomy (SISFA), Bari, September 29, 2009.

Bruno Touschek and the Birth of Electron-Positron Collisions after World War II. 4th International Conference of the European Society for the History of Science, Barcelona, 18-20 November 2010.

Rolf Widerøe, Bruno Touschek and the death-rays. XCVII National Conference of the Italian

Physical Society (SIF), L'Aquila 26–30 September 2011.

### Organization of conferences and exhibitions

Has worked for the National Institute of Nuclear Physics, together with the Committee and the Executive Council for the celebrations of Enrico Fermi's birth centennial. Project included preliminary work for the International Congress as well as the exhibition *Enrico Fermi and the Universe of Physics*, held in Rome both at the Teatro dei Dioscuri and the Accademia Nazionale dei Lincei from 29th September to 2nd October 2001.

Has contributed to the preliminary work for the organization of the Conference *Enrico Fermi and astrophysics*, at the International Center of Relativistic Astrophysics (ICRA), Pescara, 3rd October 2001.

Organization of the Conference *Carlo Bernardini: particle physics and scientific culture in Italy* (with F. Guerra, G. Jona-Lasinio, L. Maiani), Sapienza University, Physics Department, Rome, December 5, 2005.

Organization of the Workshop *Giovanni Gentile Jr: physics and culture in the thirties*, Pisa, Domus Galilaeana, December 16, 2005.

Has organized the meeting *Bruno Touschek Memorial Lectures* (with H. Bilokon, D. Babusci, G. Pancheri), Frascati National Laboratories, December 9, 2009.

Organization of the Meeting *Bruno Touschek Memorial Lectures* (with H. Bilokon, D. Babusci, G. Pancheri), Frascati National Laboratories, Frascati, November 30, 2010.

Organization (with M. Leone) of the *Symposium Internationalism of physics during the 1920s and 1930s: formation of a European research net and its impact in the development and dissemination of the European scientific culture* within the 4th International Conference of the European Society for the History of Science (Barcelona, 18-20 November 2010).

Organization of the Meeting *Bruno Touschek Memorial Lectures* (with H. Bilokon, D. Babusci, G. Pancheri), Frascati National Laboratories, Frascati, December 1, 2011.

Organization (with G. Mussardo) of the Workshop *Communicating Science, Thinking about its History*, International School for Advanced Studies, Trieste, January 25, 2013.

Member of the organizing committee of the Conference *Bruno Pontecorvo: the Scientist and the Man*, Roma, September 11-12, 2013, Sapienza University of Rome.

Member of the organizing committee of the Workshop *Thermonuclear Fusion, Space Exploration and Frontier Research in Astrophysics: History and Obstacles*, Department of Astronautical, Electrical and Energy Engineering, Sapienza University of Rome, March 2, 2016.

Member of the organizing committee of the Workshop *Opening New Windows on the cosmos: Astrophysics and Astronomy in the history of the Max Planck Society*, Max Planck Institute for the History of Science, Berlin, September 6-8, 2016.

Organization (with Virginia Trimble and Jürgen Renn) of the Special Session *Relativity at 100* at the European Week of Astronomy and Space Science, Prague 28 June, 2017.

Member of the organizing committee of the Workshop *CERN History Days. Relaunching the CERN History Project*, CERN, Geneva, 1-2 February 2018.

Organization (with Norbert Schartel) of the Historical Session within the Celebration Event: "XMM-Newton, 20 years from launch", held at the European Space Astronomy Center, Villanueva de la Cañada (Madrid), Spain, 10-11 December 2019.

Organization (with Adele La Rana and Roberto Lalli) of the on-line Workshop *Observing, sensing, detecting: Toward a multi-layered picture of the Universe from historical and epistemological perspectives*, 4-5 February 2021, and of the Round Table *Probing the cosmos in the time of multiplicity. A historical scien-*

*tific dialogue*, with Barry Barish (University of California, Riverside), Reinhard Genzel (Max Planck Institute for Extraterrestrial Physics, Garching), Malcolm Longair (Cambridge University), Christian Spiering (DESY), Alan Watson (University of Leeds).

Member of the organizing committee of the international Memorial Symposium *Bruno Touschek 100 years* held at Physics Department of Sapienza University of Rome, Frascati National Laboratories and Accademia dei Lincei, on 2–4 December 2021.