Obituary

Paolo Brenni (1954–2021)

Marco Beretta | ORCID: 0000-0002-4102-571X

University of Bologna, Bologna, Italy

marco.beretta@unibo.it

Paolo Brenni's untimely passing in the night between December 3 and 4, 2021, caused such deep and widespread emotion as to make a serene reconstruction of his intense scientific career extremely difficult.¹ The gratitude of his colleagues for the generosity with which he always shared his knowledge exacerbates the emptiness we feel around us. In any event, it would be impossible to produce an exhaustive biography by merely offering a chronological commentary on the massive bibliography of his scholarly writings, or by describing the countless collections of historical scientific instruments that he helped to reorganize, catalogue, and restore. Paolo's intellectual qualities were truly inseparable from his physical presence. This exceptionally rare harmony between intellect and manual dexterity was the key to his unique ability to tackle the history of scientific instruments. Indeed, Paolo exercised his superb skills above all with his hands—assembling, taking apart, repairing, and restoring the most complex scientific instruments, whose origin and function he was nearly always able to figure out, as in a conjuring trick. This outstanding

¹ I wish to thank Anna Giatti, Mara Miniati, and Giorgio Strano for sharing memories and documents, and for rereading this text; Alessandra Lenzi (Museo Galileo Library), for meticulously preparing Paolo's bibliography published at the end of the obituary; Fabio Bevilacqua for providing valuable information on Paolo's years in Pavia; Jonathan Mandelbaum, Paolo's friend and translator, for translating this obituary to a tight deadline; Willem Hackmann for providing me valuable information on the SIS; Francesca Antonelli for copyediting; Elena Canadelli for immediately accepting the text for publication in *Nuncius*; at last but not least I thank Paolo's family for providing me with a suitable photographic portrait of Paolo.

FIGURE 1

Paolo Brenni and his wife Andrea at the closing dinner of the 2007 SIS Study Tour to Florence
COURTESY NEIL HANDLEY

talent reminds us of Aristotle's well-known words, which seem to have been written specifically for men like him: "[man] has hands because he is the most intelligent animal. We should expect the most intelligent to be able to employ the greatest number of organs or instruments to good purpose; now the hand would appear to be not one single instrument but many, as it were an instrument that represents many instruments."²

Paolo Brenni was born in Mendrisio (Switzerland) on March 20, 1954. After graduating from high school in Lugano, he studied experimental physics at the Polytechnic School in Zurich, obtaining his degree with a dissertation on nuclear magnetic resonance entitled *¹³C- und ⁸¹Br- Kernresonanz Untersuchungen im $K_2Pt(CN)_4Br_{0.3} \cdot 3,2H_2O(KCP)$* .

In an interview to the *Gazzetta Svizzera* of April 2017, Paolo explained that his choice was guided by interests that had developed far earlier:

The theoretical physicist creates universes and theories with a writing pad and pencil (and today with computers). The experimental physicist performs experiments, measurements, and observations using apparatuses and instruments. Ever since my youth, I've loved this fascinating discipline and the history of scientific instruments.³

2 Aristotle, *De partibus animalium* 687a (translated by A.L. Peck).

3 Annamaria Loreface, "Il lavoro 'nascosto' di un illustre ticinese: Paolo Brenni e la Scienza Sperimentale," *Gazzetta Svizzera*, April 4, 2017, 6.

As he often told me, Paolo had become acquainted with technology, science, and collecting also thanks to the interests of some of his family members. In 1928, his paternal grandfather had founded Tannini Ticinesi in Melano, on Lake Lugano. The company produced tannin extracts, which are essential for dyeing hides and treating leather. Accompanied from a very early age by his father and uncle, Paolo had been fascinated by the technical-experimental processes at the plant. The factory closed in 1964, its buildings were torn down in 1987 and—to Paolo's great disappointment—the very tall chimney stack met the same fate in 2003. I believe that this event, so closely tied to his family memory, made Paolo particularly sensitive to the beauty and historical importance of the industrial landscape. Like his maternal uncle Claudio Capelli, a surgeon and enthusiastic practitioner of stereoscopic photography, Paolo also showed a precocious taste for collecting and nineteenth-century figurative arts, which persisted into his later years. The breadth of his pursuits was well reflected in the magnificent collection of books and artifacts that, over time, turned his Mendrisio villa into a small, precious museum that he loved to share with his family, friends, and guests.

Shortly after obtaining his university degree, Paolo was appointed part-time teacher of physics at the Scuola Tecnica Professionale (a vocational institute) in Lugano Trevano (1981–1982) and of mathematics at the Liceo (high school) of Bellinzona (1982–1983).

In 1981, the Italian Society of Historians of Physics and Astronomy (SISFA) was founded in Pavia. To mark the occasion, two congresses were held—one in April, the other in October—and Paolo took part in the second. He had learned of the gathering from a brief announcement in the Milan daily, *Corriere della Sera*, which listed the organizers' phone number. Thanks to Fabio Bevilacqua, one of the event's main organizers, he also met Gerard L'E. Turner, then the world's foremost expert on scientific instruments. Their meeting—facilitated by Bevilacqua and his colleagues in Pavia—proved to be crucially important, for Paolo would come to regard Turner as his mentor. In recognition of his interests and his already proven skills, Paolo was invited to reorganize and restore all the instruments of the Physics section of the Museum of the History of the University of Pavia⁴—the first major assignment about which he published a brief report.⁵

4 Fabio Bevilacqua, "Ciao Gianni," in *Storia, Didattica, Scienze Pavia 1975–2010*, ed. Fabio Bevilacqua and Patrizia Contardini (Pavia: Pavia University Press, 2010).

5 Paolo Brenni, "Gli strumenti scientifici della collezione universitaria di Pavia," in *Atti del III Congresso nazionale di storia della fisica* (n. pl. 1983), vol. 1, 176–179.

In this initial phase of his career, Paolo had already adopted his characteristic approach to collections: “in the same room that housed the instruments, which immediately underwent an initial cleaning, a small restoration workshop was set up, in which every instrument was taken apart, carefully cleaned, serviced, and reassembled.”⁶ This physical examination was followed by the preparation of a catalogue description, consolidated in a more detailed scientific study in 1990.⁷ Paolo’s work in Pavia proved essential not only because of the results obtained but also for the lasting friendships developed with Bevilacqua, Giuliano Bellodi, Pasquale Tucci, and so many other specialists. In later decades, these friendships produced major scientific projects such as the cataloguing of the Volta collection, the reorganization of the instrument collections at the Specola in Brera, and a collaboration with the Leonardo da Vinci National Museum of Science and Technology in Milan.

Paolo’s abiding love of Italy stemmed from his early awareness of the country’s exceptionally rich historical-scientific heritage but also from his encounters with people with whom he bonded immediately.

It was in Florence—a city that remained both a human and professional reference point for his entire life⁸—that his career took a decisive turn. There, he met Mara Miniati and Paolo Galluzzi, then respectively curator and director of the Istituto e Museo di Storia della Scienza (now Museo Galileo). These meetings gave rise to a series of initiatives that, within just a few years, helped to establish an uninterrupted scientific and personal cooperation. Admittedly, their paths did not cross by chance: ever since Maria Luisa Righini Bonelli’s directorship, the Florentine Museum had developed a pioneering approach to its collections that envisaged restoration as an integral part of historical analysis. The importance of this tradition had been consolidated at international level after the tragic flood of 1966 and had gained strength with a series of key publications, most notably the *Annali dell’Istituto e Museo di Storia della Scienza*. In 1986, the *Annali* became the international journal *Nuncius*. Paolo was personally involved as a member of the editorial committee from the very first issue, going on to publish numerous articles, reports, and reviews. By com-

6 Maria Carla Garbarino, “La catalogazione degli strumenti scientifici del Sistema Museale di Ateneo,” in *Storia, Didattica, Scienze Pavia 1975–2010*, ed. Fabio Bevilacqua and Patrizia Concardini (Pavia: Pavia University Press, 2010), 174.

7 Gianni Bellodi, Paolo Brenni, and Maria Teresa De Luca, *Strumenti di misura elettrici del Museo per la Storia dell’Università di Pavia*, Collana di Storia della Scienza dell’Università di Pavia (Pavia: La Goliardica Pavese, 1990).

8 Significantly, to sum up his institutional activities in the brief biography submitted to Brill for the book on Lavoisier that we are publishing together, Paolo wrote: “He worked in Florence for the CNR, the Museo Galileo and the Fondazione Scienza e Tecnica.”

binning history of science and history of scientific instruments into a coherent whole, *Nuncius* was perfectly in tune with Paolo's vision.

In 1984, thanks to funding from the Province of Florence, Paolo was tasked by the Museo Galileo with restoring and cataloguing the collection of old scientific instruments held at the Istituto Tecnico Salvemini (formerly Istituto Tecnico Toscano), which became the Fondazione Scienza e Tecnica (FST) in 1987.⁹ This important collection, centered on nineteenth-century experimental physics, became a full-scale scientific laboratory for Paolo. Until his death, he worked with Anna Giatti on cataloguing, restoring, and reinstalling the collection, as well as on launching innovative projects focused on educational experiments and on training experts in scientific instrument conservation. The first result of this long-term commitment was the publication of the catalogue of acoustical instruments as early as 1986, followed by volumes on optics (1995) and electricity and magnetism (2000).¹⁰

In 1987, with the sponsorship of the Museum in Florence and the Italian Ministry for Cultural Heritage, Paolo took part—with Mara Miniati and other instructors—in the first, pathbreaking practical and theoretical course on the identification, restoration, and cataloguing of old scientific instruments. The course was attended by 15 registered students and 12 auditors, many of whom would turn what they had learned into their profession.

In 1985–1986, with Mara Miniati, Paolo began a census of the scientific collections of historical interest in Tuscany. The project revealed the extraordinary richness of a heritage scattered across schools, institutions, private collections, and other locations where instruments unused for centuries had been miraculously preserved nearly intact.

9 Paolo worked for this institution for over 30 years, providing a highly valuable scientific and cultural contribution that gave the Fondazione unprecedented visibility. Its President is appointed by the Board of Directors and the Mayor of Florence and, in recent years, choices have been dictated by political considerations more than by scientific criteria. In 2015, the appointment of a person with no connection to the history of the institution and its instruments entailed its gradual decline and, in January 2020, the end of cooperation with the Italian National Research Council (CNR), leading to Paolo's departure. This incomprehensible break, underscored by the resignation of Mara Miniati, then Chairwoman of the Scientific Board, generated bitterness and disappointment. Fortunately, Paolo was immediately welcomed back to the Museo Galileo, a friendly institution that had never ceased to value his exceptional scientific and human qualities.

10 Paolo Brenni, *Gli strumenti del gabinetto di fisica dell'Istituto Tecnico Toscano. 1. Acustica* (Florence: Tipografia Giuntina, 1986); id., *Gli strumenti di fisica dell'Istituto Tecnico Toscano. Ottica* (Florence: Giunti, 1995); id., *Gli strumenti di fisica dell'Istituto Tecnico Toscano. Eletticità e magnetismo* (Florence: Giunti, 2000).

Also in 1986, and again with Mara, Paolo organized the VI Scientific Instrument Symposium under the aegis of the Scientific Instrument Commission. In this same extremely active period, he took part in two exhibitions also curated by the Museo Galileo (*Dal cembalo scrivano alla scrittura elettronica* (1985)¹¹ and *Occhiali da vedere* (1985)¹²), in the restoration and cataloguing of the instruments on display at the *Misura d'uomo* show (1986),¹³ and in the cataloguing of the lenses, prisms, and optical games exhibited at the *L'età di Galileo* exhibition (1987).¹⁴

In 1987, Paolo was also involved in the reinstallation of the Museo Galileo, a project completed two years later. He helped to catalogue lenses, prisms, and optical games; mechanical instruments; meteorological instruments, with Stefano Casati; and weights and measures, with Mara Miniati.¹⁵ Twenty years later, he contributed to the new reinstallation inaugurated in 2010, curating five rooms of the section devoted to the Lorraine collection.¹⁶

This intense activity crammed into a very short period channeled Paolo's interests in directions that remained constant in later decades: the interest in instrument collections and in showcasing their historical significance; a prosopographic attention to instrument makers; an emphasis on instrument restoration as a complement to cataloguing; the production of exhaustive catalogues of high scientific quality; a focus on exhibition projects that could provide a historical and narrative dimension to often technically complex artifacts; the interaction between history of instruments and history of science; and, last but not least, an abiding concern to share with colleagues and young researchers all the skills he had acquired in the field. In all of these areas, Paolo—from the late 1980s on—developed a personal profile that soon made him an eminent figure in the international history of science community.

11 Franco Soresini and Mara Miniati, with the collaboration of Paolo Brenni, eds., *Dal cembalo scrivano alla scrittura elettronica: più di un secolo di macchine per scrivere* (Florence: Istituto e Museo di Storia della Scienza, 1985). A year earlier, Paolo and Mara had also worked together on the exhibition devoted to Nobili, *L'eredità scientifica di Leopoldo Nobili: dibattito teorico e ruolo degli strumenti nella fisica del primo Ottocento* (Reggio Emilia: Comune di Reggio Emilia, 1984).

12 *Occhiali da vedere. Arte scienza e costume attraverso gli occhiali* (Florence: Istituto e Museo di Storia della Scienza, 1985).

13 *Misura d'uomo. Strumenti, teorie e pratiche dell'antropometria e della psicologia sperimentale tra '800 e '900* (Florence: Istituto e Museo di Storia della Scienza, 1986).

14 Mara Miniati, ed., *L'età di Galileo. Il secolo d'oro della scienza in Toscana* (Florence: Istituto e Museo di Storia della Scienza, 1987).

15 Mara Miniati, ed., *Museo di Storia della Scienza. Catalogo* (Florence: Giunti, 1990), 78–89, 148–173, 286–301, and 354–366.

16 Rooms XII–XVI; see <https://catalogo.museogalileo.it/>.

Paolo's stay in Florence sharpened his historiographical and museological approach, which matured in the following decades. Another crucial step was his appointment by the French National Center for Scientific Research (CNRS) to the Centre de Recherche en Histoire des Sciences et des Techniques at the Cité des Sciences et de l'Industrie in Paris (1988–1991). This experience put him in contact with institutions and colleagues that broadened his research horizons and deepened his interest in the history of electricity and French makers of precision instruments. From the late 1980s on, Paolo incorporated Paris and France into his sphere of action. In the 1990s and 2000s, he worked on major projects with the Musée des Arts et Métiers; in 2006, he became a member of the scientific advisory board of the national project for the conservation and promotion of France's scientific heritage of the second half of the twentieth century. However, these important collaborative ventures never took Paolo away from Florence and Italy. Between 1992 and 2000, with funding from the Italian National Research Council (CNR), he served as research fellow at the Museo Galileo and, from 2001 to his retirement in May 2021, as CNR research fellow appointed to the Fondazione Scienza e Tecnica, also in Florence. These research positions had two benefits: first, they gave him academic recognition for scientific expertise that was hard to classify in the conventional categories of disciplines recognized in European university systems; second, they gave him a very broad freedom to conduct his work wherever he was attracted by the presence of collections or relevant projects.

It would certainly be most useful—as with his bibliography—to compile a complete list of all the collections and projects in which he was involved during his career, but they are so numerous and their documentation is still so fragmentary that I cannot provide a full account of them. In addition to formal contracts for the study and restoration of collections, Paolo was often contacted by auction houses, antique dealers, private collectors, and government agencies for advice on collections or single instruments. While this activity generated some highly interesting discoveries, its history is extremely hard to reconstruct. As with his official research, Paolo prepared detailed accounts of these investigations and, whenever possible, photographing the instruments submitted to his scrutiny.

What follows is merely a description of the projects that Paolo mentioned in a résumé sent to the University of Bologna in late 2019 ahead of the planned reorganization—completed a year later—of the Augusto Righi collection in the Physics and Astronomy Department.

In the 1990s, Paolo restored and catalogued many Italian collections including the Liceo Prati in Trento, the Liceo Foscolo in Pavia, the University Museum in Pavia, and the Liceo Visconti in Rome. He studied old instruments of spe-

cial note such as the Jesse Ramsden circle at the Astronomical Observatory in Palermo¹⁷ and the Angelo Secchi meteorograph in the Astronomical Museum at Monte Porzio. At the international level, he partnered with the Conservatoire des Arts et Métiers in Paris, the Museum for the History of Science at Oxford, the Museum Boerhaave in Leiden, the Museo de la Ciencias in Madrid and, from the early 2000s, with the French astronomical observatories of Lyon, Haute Provence, and Nice. Paolo was also one of the founders of the UNIVERSEUM association, an assiduous participant in ASEISTE (Association de Sauvegarde et d'Études des Instruments Scientifiques et Techniques de l'Enseignement), and a generous provider of answers to historical queries submitted to the RETE mailing list.¹⁸ This dense network of high-level working relationships led to Paolo's election as President of the Scientific Instrument Society (from 2005 to his death), President of the Scientific Instrument Commission (2003–2013), and Vice-President of the International Union for History and Philosophy of Science—Division of History of Science and Technology (2009–2013).

Between 1999 and 2003, Paolo helped to catalogue Volta's instruments in two locations: the University of Pavia and the Tempio Voltiano in Como. Also in 2003, he oversaw the restoration of the instruments at the Liceo Volta in Como and of a group of devices at the Ufficio Centrale di Meteorologia Agraria (UCEA) in Rome and the Liceo Paolo Sarpi in Bergamo.

Between 2009 and 2011, he disassembled, restored, and reassembled the large refractor telescope built by Joseph von Fraunhofer in 1823, used by the astronomer Friedrich Georg Wilhelm Struve, and kept at the Tartu Observatory (Estonia).

In 2016, he began restoring a series of instruments at the Museo Caffi in Bergamo and cataloging and reorganizing the scientific instrument collection of the Museo Civico in Modena.

In 2011, Paolo's work at the Fondazione Scienza e Tecnica in Florence and the new displays there prompted him to produce a series of historical-educational videos to explain the functioning of old scientific instruments. The series was prepared with Anna Giatti and the video maker Antonio Chiavacci. Released on YouTube,¹⁹ it proved an instant success, winning attention and praise not only from the Foundation staff but also from schools and students.

17 And in 2012, he also restored the Merz refractor telescope on the same site.

18 The mailing list, administered by the History of Science Museum at Oxford (<https://www.hsm.ox.ac.uk/mailling-list>), received the earliest moving and intense reactions to Paolo's passing.

19 <http://www.youtube.com/user/florencefst/videos?sort=dd&view=0&page=1> See Paolo

Paolo's educational creativity was unleashed whenever he was invited to give a lecture or a course. He showed and shared his knowledge without ever acting professorial, and he would invite attendees to take an active part in the event. Indeed, his university courses were almost always accompanied by experimental demonstrations that illustrated the topic in a novel and participative way. His university career included the appointment to the Sarton Chair of History of Science at the Ghent University (Belgium) for the academic year 2000–2001. His attention to the young had made him aware of the institutional difficulties they face when choosing such an uncertain career. In 2017, for example, he wrote:

Today it is very hard to find career opportunities in Italy. Cuts in research funds and the niche status of history of science make it difficult for a young researcher to embark on a rewarding career. I know young and extremely able researchers who are forced to spend their time looking for research grants or fixed-term contracts in order to survive.²⁰

I am sure that he would have viewed the Museo Galileo's decision to give his name to a post-doctoral fellowship in the study and restoration of scientific instruments as a fitting recognition of the attention he consistently devoted to training young people.

Back in 1999, Paolo and I, under the auspices of Dominique Ferriot, had developed a project to catalogue the instruments that had belonged to the French chemist Antoine-Laurent Lavoisier, most of which are held at the Musée des Arts et Métiers in Paris. However, it was only in 2015, thanks to Catherine Cuenca, that the right circumstances came together to make the project possible. As we both used to say, this became our most demanding task. We began in 2017 and consigned the final, revised version of the catalogue in late November 2021, just days before Paolo's death. The Lavoisier collection poses an especially difficult challenge because, as is well known, he commissioned the making of instruments—many of which he personally designed—that are unique and cannot be compared with other contemporary productions. This challenge, relating to so prominent a figure in history of science, came to us at a time when we had both perhaps acquired enough experience to take it up with some hope of success. Given the number of difficulties and obstacles

Brenni, "Filming Nineteenth Century Physics Demonstrations with Historical Instruments," in *Historical Scientific Instruments in Contemporary Education*, ed. Elizabeth Cavicchi and Peter Heering (Leiden: Brill, 2021), 34–49.

20 Lorefice, "Il lavoro 'nascosto' di un illustre ticinese," 7.

encountered, we were all the more relieved to have been able to complete the project. Our inability to celebrate its publication together will be a source of deep and permanent sorrow for me.

These years of working together gave me a first-hand opportunity to appreciate Paolo's exceptional talents. In his hands, pieces and fragments of all sorts—previously inventoried and described without a clear understanding of what they were—became recognizable instruments. Clumsy tampering and previous restorations (not always satisfactory) were rapidly put right, bringing the Lavoisier collection gradually back to life. I believe I am not mistaken in stating that the famous gasometers built by Mégnié in 1788 are now in their best condition since their acquisition by the Conservatoire National des Arts et Métiers (CNAM) in 1866. Other instruments, whose purpose long remained a mystery, have now been positively identified. The assurance and ease with which Paolo handled these instruments were such as to surprise even the most experienced curators, while the younger ones, more than once, feared that his handling would cause breakage. Not only did this never happen, but, in Paolo's hands, the instruments came back to life; whenever he could, he demonstrated this by making a device work again with surprising speed. For him, the repetition of an experiment had to be as quick and spectacular as those of Jean-Antoine Nollet, an author on whom he was one of the foremost experts. The enthusiasm that prevailed in these wonderful reconstructions spread to the Museum's curators and restorers. From the outset, this created an exciting atmosphere that we shared with many staff members at the professional and human level. We conducted much of our research at the Museum's reserves in Saint-Denis outside Paris. With its tens of thousands of instruments, machines, and artifacts of all kinds sitting on open shelves, the facility was, for Paolo, an enchanted place. Our lunch breaks would turn into guided tours, either to focus on a single instrument that interested him or to lose ourselves in an entire collection. His inexhaustible curiosity was backed by an extremely solid scientific training that, over time, was enhanced by a surprising close attention to the cultural history underlying the production of instruments and machines. This working method effectively revealed his personality as a nineteenth-century *savant*—as he often liked to define himself—a learned and enthusiastic admirer of scientific and technical achievements. However, this nostalgic sympathy for the Belle Époque was more a personal taste than an actual personality trait, for Paolo was a man fully immersed in his time, who could feel at ease in conversations with people regardless of age, background, social class or gender. Indeed, beyond his manual dexterity, Paolo was a most delightful conversationalist, capable of addressing a wide variety of topics with a rare blend of seriousness and humor.

His multifarious scientific career earned him many prizes and awards, most notably the Paul Bunge Prize from the H. Jenemann Stiftung for studies on scientific instruments and material culture (2002), the Scientific Instrument Society Medal (2005); and the Marc-Auguste Pictet Medal from the Committee of the Société de Physique et d'Histoire Naturelle in Geneva for his contributions to history of science and instrument restoration.

While the study of scientific instruments was his passion, it did not rule out many other interests, for which he displayed equal curiosity and—in a good many instances—expertise. Art history, technology, industry, museums and universal exhibitions, cinema, and industrial archeology were all subjects that captivated him deeply.

Paolo was also a gifted draftsman, and on several occasions he showed me watercolors of industrial landscapes drawn with precision but always with a style that revealed his characteristic vision of the world.

Notwithstanding his fondness for Italy, Paolo loved Switzerland and in particular his native town, Mendrisio. Like many of his fellow citizens, he celebrated August 1 by flying the red flag with the white cross from the window of his villa. During our conversations, he proudly reminded me that Mendrisio had been, in the late nineteenth century, one of the first towns in the Ticino to be electrified—hence its possibly apocryphal nickname of *ville lumière* of the Ticino—and that, a few kilometers from the town center, stood one of Europe's largest gold refineries. For me, with my Milanese roots, these displays of affection for his native land offered opportunities for good-natured bantering that drew on the vast repertoire nurtured by the historical, linguistic, and cultural ties between the Lombard capital and the neighboring Swiss Ticino. Despite a friendship of over thirty years, we would still refer to each other as “il Brenni” and “il Beretta”—a typical form of self-identification in an idiom that was and still is very popular in our part of the world.

While his passion for his work was a characteristic trait of his personality, Paolo had no shyness in expressing deep love for his family—his wife Andrea, his daughter Camilla, and his son Oliver. To them go my thoughts of heartfelt affection.

Bibliography of Paolo Brenni

1980

- "NMR-Relaxation von ^{13}C in $\text{K}_2\text{Pt}(\text{CN})_4\text{Br}_{0.3} \cdot 3.2\text{H}_2\text{O}$ (κCP)," with D. Brinkmann, M. Mali, J. Ross, and H. Arend, *Helvetica Physica Acta* 53, no. 5 (1980): 230.
- "Relaxation of Enriched ^{13}C in the One-dimensional Conductor $\text{K}_2\text{Pt}(\text{CN})_4\text{Br}_{0.3} \cdot 3.2 \text{H}_2\text{O}$ (κCP)," with D. Brinkmann, M. Mali, J. Ross, O. Kanert, and M. Mehring, *Bulletin of Magnetic Resonance* 2, no. 1–4 (1980), Special issue: *Proceedings of the Joint ISMAR-Ampere International Conference on Magnetic Resonance, Delft, 1980*, 269.

1983

- "Archeologia industriale in Canton Ticino," *Archeologia Industriale* 2 (1983): 50–53.
- "Detection of a Second Br Site in $\text{K}_2\text{Pt}(\text{CN})_4\text{Br}_{0.3} \cdot 3.2 \text{H}_2\text{O}$ (κCP) by ^{81}Br and ^{39}K NMR," with D. Brinkmann, H. Huber, M. Mali, J. Ross, and H. Arend, *Solid State Communications* 47, no. 5 (1983): 415–418.
- "Le macchine," in *Archeologia industriale in Lombardia* (Milan: Mediocredito Lombardo, 1981–1983), v. 3 (1983), 47–63.
- "Museums and Exhibitions: Discussion Paper," in *Proceedings of the International Conference on Using History of Physics in Innovative Physics Education: 5–9 September 1983, Pavia, Italy*, eds. Fabio Bevilacqua and Peter J. Kennedy (Pavia: Centro Studi per la Didattica della Facoltà di Scienze Matematiche, Fisiche e Naturali, Università di Pavia, 1983), 274–278.
- "Gli strumenti scientifici della collezione universitaria di Pavia," in *Atti del III Congresso nazionale di storia della fisica: Palermo, 11–16 ottobre 1982*, eds. Fabio Bevilacqua and Arturo Russo ([n.pl., n.p.], 1983), v. 1, 176–179.

1984

- "La galvanometria dopo Nobili," *Giornale di fisica della Società Italiana di Fisica* 25, no. 3–4 (1984): 335–346; reprinted in *Leopoldo Nobili e la cultura scientifica del suo tempo*, ed. Gino Tarozzi (Bologna: Nuova Alfa Editoriale, 1986?), 235–257; French transl., "La galvanométrie après Leopoldo Nobili," in 1880–1980, *Un siècle d'électricité dans le monde: Actes du premier Colloque international d'histoire de l'électricité: Paris 15–17 avril 1986*, ed. Fabienne Cardot (Paris: Presses Universitaires de France, 1987), 195–222.
- "Gli strumenti scientifici," with Willem D. Hackmann, in *L'eredità scientifica di Leopoldo Nobili: Dibattito teorico e ruolo degli strumenti nella fisica del primo Ottocento: Reggio Emilia, Teatro municipale, 25 ottobre–18 novembre 1984* (Reggio Emilia: Comune di Reggio Emilia [etc.], 1984), 27–100.

1985

Dal cembalo scrivano alla scrittura elettronica: Più di un secolo di macchine per scrivere: Firenze, 25 maggio–30 giugno 1985, eds. Franco Soresini and Mara Miniati, with the collaboration of Paolo Brenni and others (Florence: Istituto e Museo di Storia della Scienza, 1985).

"Italian Scientific Instrument Makers of the Nineteenth Century and Their Instruments," in *Nineteenth-Century Scientific Instruments and Their Makers: Papers Presented at the Fourth Scientific Instrument Symposium, Amsterdam 23–26 October 1984*, ed. Peter Richard de Clercq (Amsterdam: Rodopi; Leiden: Museum Boerhaave, 1985), 183–203.

"Strumenti scientifici: Problemi di schedatura," with Mara Miniati, *Bollettino d'informazioni* 6, no. 2 (1985): 99–111.

1986

"Cleaning & Re-Lacquering of Brass Instruments," *Bulletin of the Scientific Instrument Society* 10 (1986): 2–3.

"Costruttori italiani di strumenti scientifici del XIX secolo," with Massimo Misiti, *Nuncius* 1, no. 1 (1986): 141–184.

Gli strumenti del Gabinetto di Fisica dell'Istituto Tecnico Toscano. 1, Acustica (Florence: Tip. Giuntina, 1986).

"The Instruments of Leopoldo Nobili," *Bulletin of the Scientific Instrument Society* 8 (1986): 4–6.

1987

"Breve storia del motore a scoppio sino agli inizi del XX secolo," *Bollettino ingegneri, Collegio Ingegneri della Toscana* 5 (1987): 7–10.

"I filosofi e le meteore," with Stefano Casati, in *L'età di Galileo: Il secolo d'oro della scienza in Toscana*, ed. Mara Miniati (Florence: Istituto e Museo di Storia della Scienza, 1987), 127–145.

"Lenti, prismi e giochi ottici," in *L'età di Galileo: Il secolo d'oro della scienza in Toscana*, ed. Mara Miniati (Florence: Istituto e Museo di Storia della Scienza, 1987), 78–85.

"La scienza con gli occhi di ieri," *Action, Junior Chamber Firenze* 1 (1987): 20–22.

1988

"Les instruments scientifiques anciens," in *Science Education and the History of Physics = Enseignement scientifique et histoire de la physique: 21–25 novembre 1988, Paris* (Paris: Centre Scientifique d'Orsay, Université Paris-Sud, 1989).

"Unusual Theodolite Conceived by Amici," *Bulletin of the Scientific Instrument Society* 16 (1988): 7–9.

1989

"The Illustrated Catalogues of Scientific Instrument-Makers," in *Studies in the History of Scientific Instruments: Papers presented at the 7th Symposium of the Scientific Instruments Commission of the Union Internationale d'Histoire et de Philosophie des Sciences: Paris, 15–19 September 1987*, eds. Christine Blondel and others (London: R. Turner Books, 1989), 169–178.

Inventario degli strumenti del Gabinetto di Fisica dell'Istituto Tecnico Toscano, with Anna Giatti (Florence: Associazione Interaccademica; Fondazione Scienza e Tecnica, 1989).

"Le premier étalon de résistance et les travaux de la British Association for the Advancement of Science," in *Standardization and Units in Electricity 1850–1914: Papers Arising from an International Workshop Held at the Centre du Recherche en Histoire des Sciences et des Techniques, Cité des Sciences et de l'Industrie, Paris, on 6 July 1988* (Paris: Cité des Sciences et de l'Industrie, 1989).

"Riportati alla luce 3000 strumenti scientifici del tempo del Granduca Leopoldo," *SMI Review—Art and Technology* 18, no. 15 (1989): 25–30.

"Strumenti scientifici," in *Storia del disegno industriale*, ed. Enrico Castelnuovo (Milan: Electa, 1989–1991), v. 1: 1750–1850: *L'età della rivoluzione industriale* (1989), 379–385.

1990

"Art and Science: The Design of Scientific Instruments," in *Creativity in the Arts and Science*, eds. William R. Shea and Antonio Spadafora (Canton: Science History Publications, 1990), 121–141.

"L'artigianato della scienza," with Mara Miniati, in *La seduzione dell'artigianato: Artigianato nella storia* (Florence: SPES, 1990), 143–156.

"Comunicazioni e telecomunicazioni," in *Storia del disegno industriale*, ed. Enrico Castelnuovo (Milan: Electa, 1989–1991), v. 2: 1851–1918: *Il grande emporio del mondo* (1990), 292–297.

"Il design degli strumenti scientifici," *Nuova Civiltà delle macchine* 8, no. 2–3 (1990), Special issue: *Dal profondo del pensiero*, 87–98.

Guida alla mostra Strumenti di misura elettrici del Museo per la Storia dell'Università di Pavia, with Giuliano Bellodi and Maria Teresa De Luca (Pavia: Università degli Studi di Pavia, 1990).

"L'industria degli strumenti scientifici in Francia nel XVIII e XIX secolo," in *Storia delle scienze* (Milan: Banca popolare di Milano, 1990–1995), v. 1: *Strumenti*, ed. Gerard L'E. Turner (1990), 450–463; reprinted in *Storia delle scienze* (Turin: G. Einaudi, 1991–1995), v. 1: *Strumenti*, ed. Gerard L'E. Turner (1991), 450–463.

"La nascita di un laboratorio moderno: Il Gabinetto di Fisica dell'Istituto Tecnico Toscano," in *Le meraviglie dell'ingegno: Strumenti scientifici dai Medici ai Lorena*, ed. Francesco Gravina (Florence: Ponte alle Grazie, 1990), 69–118.

"Il patrimonio storico-scientifico italiano: Note relative al Convegno di Bologna," *Nuncius* 5, no. 2 (1990): 277–280.

"Scientific Instrument Collections in Italy: The Bologna Meeting," *Bulletin of the Scientific Instrument Society* 25 (1990): 17–18.

Strumenti antichi del Gabinetto di Fisica di Pavia: Strumenti di misura elettrici: Elettroscopi, elettrometri, galvanometri, with Giuliano Bellodi and Maria Teresa De Luca, 1 vhs (Florence: Università degli Studi di Firenze, Centro Didattico-Televisivo, 1990).

"Strumenti scientifici," in *Storia del disegno industriale*, ed. Enrico Castelnuovo (Milan: Electa, 1989–1991), v. 2: 1851–1918: *Il grande emporio del mondo* (1990), 385–390.

1991

"Elettronica di consumo," in *Storia del disegno industriale*, ed. Enrico Castelnuovo (Milan: Electa, 1989–1991), v. 3: 1919–1990: *Il dominio del design* (1991), 301–305.

"I filosofi e le meteore," with Stefano Casati, in *Museo di Storia della Scienza: Catalogo*, ed. Mara Miniati (Florence: Giunti, 1991), 148–173.

"Il Gabinetto di Fisica dell'Istituto Tecnico Toscano G. Salvemini," in *Instrumenta: Il patrimonio storico scientifico italiano: Una realtà straordinaria*, ed. Giorgio Dragoni (Bologna: Grafis, 1991), 167–174.

"Lenti, prismi e giochi ottici," in *Museo di Storia della Scienza: Catalogo*, ed. Mara Miniati (Florence: Giunti, 1991), 78–89.

"Misure, pesi e bilance," with Mara Miniati, in *Museo di Storia della Scienza: Catalogo*, ed. Mara Miniati (Florence: Giunti, 1991), 354–365.

"Strumenti di meccanica," in *Museo di Storia della Scienza: Catalogo*, ed. Mara Miniati (Florence: Giunti, 1991), 286–301.

"Strumenti scientifici," in *Storia del disegno industriale*, ed. Enrico Castelnuovo (Milan: Electa, 1989–1991), v. 3: 1919–1990: *Il dominio del design* (1991), 376–382.

1992

L'antico Gabinetto di Fisica del Liceo (Pavia: Liceo Ginnasio Statale Ugo Foscolo, 1992).

"Il Gabinetto di Fisica dell'Istituto Tecnico per Geometri Gaetano Salvemini," *Salvemini chi può* (1992): 32–35.

"Una mostra su Giuseppe Belli," *Nuncius* 7, no. 2 (1992): 253–255.

"Il restauro della collezione di apparecchi di fisica del Liceo Visconti di Roma," *Nuncius* 7, no. 1 (1992): 219–222.

"Secchi's Meteorograph," *Bulletin of the Scientific Instrument Society* 34 (1992): 12.

"Secchi's Meteorograph: Rediscovering and Restoring a Forgotten Scientific Instrument," *Science and Technology for Cultural Heritage* 1 (1992): 227–235.

1993

- "19th Century French Scientific Instrument Makers I: H-P Gambey," *Bulletin of the Scientific Instrument Society* 38 (1993): 11–13.
- "19th Century French Scientific Instrument Makers II: The Chevalier Dynasty," *Bulletin of the Scientific Instrument Society* 39 (1993): 11–14.
- "I costruttori stranieri di strumenti scientifici nelle collezioni italiane," in *Strumenti di fisica e cultura scientifica nell'Ottocento in Italia: Atti del Convegno nazionale su Strumenti di fisica e cultura scientifica nell'Ottocento in Italia: Villa Bottini e Liceo Machiavelli, Lucca, 8–9 maggio 1991*, eds. Emilio Borch, Renzo Macii, and Flavio Vetrano (Firenze, [s.n.], 1993), 103–110.
- "Einstein's 'Maschinen' for the Measurement of Small Quantities of Electricity," in *The Collected Papers of Albert Einstein* (Princeton: Princeton University Press, 1987–), v. 5: *The Swiss Years: Correspondence, 1902–1914*, eds. Martin J. Klein, Anne J. Kox, and Robert Schulmann (1993), 51–55.
- "Il meteorografo di padre Angelo Secchi," *Nuncius* 8, no. 1 (1993): 197–247.
- "I musei delle scienze," in *Enciclopedia italiana di scienze, lettere ed arti. Quinta appendice*, v. 3: *It-O. Museo* (Rome: Istituto della Enciclopedia Italiana, 1993), 596–597.
- Museo di Storia della Scienza: Catalogue of Mechanical Instruments* (Florence: Giunti, 1993).
- "Restauro di strumenti storico-scientifici e filosofie di intervento," with Mara Miniati, in *La conservazione e il restauro oggi* (Bologna: Istituto per i Beni Artistici, Culturali e Naturali della Regione Emilia-Romagna, 1992–1993), v. 4: *Restauro di strumenti e materiali: Scienza, musica, etnografia*, ed. Luisa Masetti Bitelli (1993), 51–61.
- "SIC: Un programma per la catalogazione degli strumenti scientifici di interesse storico," with Marco Berni, Fabio Guidi, Mara Miniati, Giovanni Di Pasquale, Franca Principe, Anna Giatti, and Francesca Vannozzi, *Nuncius* 8, no. 2 (1993): 689–697.
- "Strumenti scientifici: Il restauro del Meteorografo Secchi," *OPD Restauro* 5 (1993): 99–107.
- "Le tube à limaille de Calzecchi Onesti et la TSF de Marconi: Quelques réflexions sur les débuts de la TSF en Italie," *Revue d'histoire des sciences* 46 (1993), Special issue: *Edouard Branly et la TSF: Tradition ou innovation?*, 73–82.
- "A Very Peculiar Italian Instrument: De Rossi's Icnographic and Orthographic Machine for Surveying Catacombs," *Bulletin of the Scientific Instrument Society* 37 (1993): 19–20.

1994

- "19th Century French Scientific Instrument Makers III: Lerebours et Secretan," *Bulletin of the Scientific Instrument Society* 40 (1994): 3–6.
- "19th Century French Scientific Instrument Makers IV: Heinrich Daniel Ruhmkorff (1803–1877)," *Bulletin of the Scientific Instrument Society* 41 (1994): 4–8.

- "19th Century French Scientific Instrument Makers v: Jules Carpentier (1851–1921)," *Bulletin of the Scientific Instrument Society* 43 (1994): 12–15.
- "Alcune considerazioni sulle collezioni di strumenti scientifici di interesse storico: L'esempio del Liceo E.Q. Visconti di Roma," in *Collezione strumenti di fisica Liceo E.Q. Visconti, Roma*, eds. Alessandro Orlandi and William Russell (Rome: Euroma, 1994), 12–20; Paolo Brenni also authored the catalogue entries of the physics instruments.
- "Il barometro ritrovato," *Nuncius* 9, no. 2 (1994): 671–676.
- La cera e la cartapesta: Modelli ottocenteschi per lo studio delle scienze naturali, 18–23 aprile 1994*, eds. Guido Gori and Massimo Misiti, with the collaboration of Paolo Brenni (Florence: Fondazione Scienza e Tecnica, 1994).
- Giochi ottici fino al cinematografo: Catalogo della mostra, Firenze, 18–30 aprile 1994* (Florence: Fondazione Scienza e Tecnica, 1994).
- "Giuseppe Belli, gli strumenti e i costruttori," with Giuliano Bellodi, in *Atti del convegno La fisica a Pavia nelle opere di Giuseppe Belli (1791–1860): Pavia, Palazzo Centrale dell'Università, 11 dicembre 1991; Calasca, Villa Cambiagio già Belli, 25 gennaio 1992* (Pavia: La Goliardica Pavese, 1994), 77–112.
- "Les instruments de physique et de précision," in *Le Conservatoire National des Arts et Métiers au coeur de Paris: 1794–1994*, eds. Michel Le Moël and Raymond Saint-Paul (Paris: Conservatoire National des Arts et Métiers, 1994), 165–170.
- "Soleil-Duboscq-Pellin: A Dynasty of Scientific Instrument Makers," in *Proceedings of the Eleventh International Scientific Instrument Symposium: Bologna University, Italy, 9–14 September 1991*, eds. Giorgio Dragoni, Anita McConnell, and Gerard L'E. Turner (Bologna: Grafis, 1994), 107–111.
- "Three Dutch Conferences at Leyden, 7–16 September," with others, *Bulletin of the Scientific Instrument Society* 43 (1994): 3–11.

1995

- "19th Century French Scientific Instrument Makers vi: The Triumph of Experimental Acoustics: Albert Marloye (1795–1874) and Rupert Koenig (1832–1901)," *Bulletin of the Scientific Instrument Society* 44 (1995): 13–17.
- "19th Century French Scientific Instrument Makers vii: Paul Gustave Froment (1815–1865)," *Bulletin of the Scientific Instrument Society* 45 (1995): 19–24.
- "19th Century French Scientific Instrument Makers viii: Eugène Ducretet (1844–1915)," *Bulletin of the Scientific Instrument Society* 46 (1995): 12–17.
- "19th Century French Scientific Instrument Makers ix: Louis Joseph Deleuil (1795–1862) and His Son Jean Adrien Deleuil (1825–1894)," *Bulletin of the Scientific Instrument Society* 47 (1995): 4–7.
- "Les florilèges de la torsion," *Les Cahiers de science et vie* 26 (1995): 80–87.
- "Le meraviglie del progresso: Le esposizioni universali e i musei tecnico-scientifici," in

- Storia delle scienze* (Milan: Banca Popolare di Milano, 1990–1995), v. 5: *Conoscenze scientifiche e trasferimento tecnologico*, ed. Vittorio Marchis (1995), 142–185; reprinted in *Storia delle scienze* (Turin: G. Einaudi, 1991–1995), v. 5: *Conoscenze scientifiche e trasferimento tecnologico*, ed. Vittorio Marchis (1995), 142–185.
- “Le météorographe du père A. Secchi,” *La météorologie*, ser. 8, Special issue (April 1995): 116–117.
- La pneumatica nei laboratori* (Florence: Fondazione Scienza e Tecnica, 1995).
- Gli strumenti del Gabinetto di Fisica e di Meccanica*, with Anna Giatti, Guido Gori, and Massimo Misiti (Florence: Fondazione Scienza e Tecnica, 1995).
- Gli strumenti di fisica dell'Istituto Tecnico Toscano: Ottica* (Florence: Giunti, 1995).
- “Temistocle Calzecchi-Onesti e il Coherer: Storia di una scoperta incompleta,” in *Cento anni di radio: Le radici dell'invenzione*, eds. Anna Guagnini and Giuliano Pancaldi (Turin: Edizioni Seat, 1995), 271–302.
- “Le triomphe de l'acoustique expérimentale: Marloye et Koenig,” *La revue, Musée des Arts et Métiers* 12 (1995): 29–37.

1996

- “19th Century French Scientific Instrument Makers x: The Richard Family,” *Bulletin of the Scientific Instrument Society* 48 (1996): 10–14.
- “19th Century French Scientific Instrument Makers xi: The Brunners and Paul Gautier,” *Bulletin of the Scientific Instrument Society* 49 (1996): 3–8.
- “19th Century French Scientific Instrument Makers xii: Louis Clément François Breguet and Antoine Louis Breguet,” *Bulletin of the Scientific Instrument Society* 50 (1996): 19–24.
- “19th Century French Scientific Instrument Makers xiii: Soleil, Duboscq, and their Successors,” *Bulletin of the Scientific Instrument Society* 51 (1996): 7–16.
- “Alcune considerazioni sulle collezioni di strumenti scientifici nell'Europa del XVIII secolo,” in *La politica della scienza: Toscana e stati italiani nel tardo Settecento: Atti del convegno di Firenze 27–29 gennaio 1994*, eds. Giulio Barsanti, Vieri Becagli, and Renato Pasta (Florence: L.S. Olschki, 1996), 295–304.
- L'elettricità e le trasmissioni: Telegrafia, telegrafia senza fili, radio*, with Massimo Misiti and Licia Priami (Florence: Fondazione Scienza e Tecnica, 1996).
- Étude sur le patrimoine instrumental de l'Observatoire de la Côte d'Azur: Rapport*, with Anthony Turner ([n.pl., n.p.], 1996).
- “L'Istituto Tecnico Toscano à Florence,” *La revue, Musée des Arts et Métiers* 14 (1996): 20–27.
- Modelli cristallografici e strumenti per lo studio dei minerali*, with Massimo Misiti and Serena Morini (Florence: Fondazione Scienza e Tecnica, 1996).
- “Nota su alcuni strumenti recentemente acquisiti dalla Fondazione Scienza e Tecnica,” *Nuncius* 11, no. 1 (1996): 135–149.

"Strumenti vari," in *Orologi e strumenti della Collezione Beltrame*, ed. Mara Miniati (Florence: Giunti, 1996), 136–167.

1997

"À propos des pendules de Foucault: Une soirée scientifique sous la Coupole de Brunelleschi," *La revue, Musée des Arts et Métiers* 20 (1997): 60–61.

"Le attività della Fondazione Scienza e Tecnica di Firenze," with Massimo Misiti, in *Convegno nazionale su Strumenti e cultura scientifica nell'Ottocento in Italia: Firenze, 3–4 maggio 1995*, eds. Emilio Borch, Renzo Macii, and Flavio Vetrano (Florence: Idealpress, 1997), 133–137.

"Historical Instruments in Portugal," *Bulletin of the Scientific Instrument Society* 55 (1997): 26–29.

"Les instruments scientifiques anciens: Un patrimoine à redécouvrir," *Bulletin de la SABIX, Société des Amis de la Bibliothèque et de l'Histoire de l'École Polytechnique* 18 (1997), Special issue: *Instruments scientifiques anciens conservés par la Bibliothèque de l'École Polytechnique*, 5–7.

"Mystery Object: Hartl's Disk," *Bulletin of the Scientific Instrument Society* 55 (1997): 29.

"Note relative ai problemi concernenti il restauro di strumenti scientifici," *Museologia scientifica* 14, no. 2 (1997): 365–371.

"Les outils de la science," *Connaissance des arts* 546 (1997): 96–103.

"Physics Instruments in the 20th Century," in *Science in the Twentieth Century*, eds. John Krigé and Dominique Pestre (Amsterdam: Harwood Academic Publishers, 1997), 741–757.

"Gli strumenti scientifici," in *Le collezioni scientifiche del Ginnasio Liceo Giovanni Prati di Trento*, ed. Renato G. Mazzolini (Trento: Ginnasio Liceo Giovanni Prati, 1997), 61–161.

1998

"Barograph—Chladni Plate—Meteorograph—Polarimeter and Polariscopes—Tuning Fork," in *Instruments of Science: An Historical Encyclopedia*, eds. Robert Bud and Deborah Jean Warner (London: The Science Museum, 1998), 50–52; 105–107; 375–377; 475–477; 635–637.

"Les constructeurs d'appareils radiologiques (1895–1915)," in *Les rayons de la vie: Une histoire des applications médicales des rayons X et de la radioactivité en France: 1895–1930*, eds. Monique Bordry and Soraya Boudia (Paris: Institut Curie, 1998), 88–100.

"La funzione degli strumenti scientifici nella didattica fra Settecento e Ottocento," *Studi settecenteschi* 18 (1998): 421–431.

"Galileo Ferraris and the International Community of Electricians," in *Galileo Ferraris and the Conversion of Energy Developments of Electrical Engineering over a Century:*

Proceedings of the International Symposium, 27–29 October 1997, Torino (Turin: [n.p.], 1998), 23–42.

“Lo stereocartografo Santoni modello iv: Cronaca di un salvataggio,” *Nuncius* 13, no. 1 (1998): 187–191.

1999

“La panoplie du laboratoire moderne,” *Les Cahiers de science et vie* 51 (1999), Special issue: *1000 ans de sciences: XIXe siècle, Les premiers grands laboratoires*, 16–24.

“Restoration or Repair? The Dilemma of Ancient Scientific Instruments,” in *Reversibility: Does it exist?*, eds. Andrew Oddy and Sara Carroll (London: British Museum, 1999), 19–24.

“La scienza sulla torre Eiffel,” in *Dalla Toscana all’Europa di Gustave Eiffel: La torre Eiffel in riva all’Arno*, eds. Daniela Lamberini and Rosalia Manno Tolu (Livorno: Sillabe, 1999), 91–93; French transl., “La science sur la tour Eiffel,” in *De la Toscane à l’Europe de Gustave Eiffel: La tour Eiffel au bord de l’Arno*, eds. Daniela Lamberini and Rosalia Manno Tolu (Livorno: Sillabe, 1999), 91–93; Paolo Brenni also authored the catalogue entries of some of the instruments.

La strumentazione elettrica dell’Ottocento: Mostra di strumenti e libri dalla pila di Volta all’era dell’elettricità: Biblioteca Universitaria, Pavia, 6–25 settembre 1999, with Giuliano Bellodi and others (Pavia: Università degli Studi di Pavia, 1999).

“The Van de Graaff Generator: An Electrostatic Machine for the 20th Century,” *Bulletin of the Scientific Instrument Society* 63 (1999): 6–13.

2000

“Better than New? Scientific Instrument Restoration in Italy,” in *The Restoration of Scientific Instruments: Proceedings of the Workshop held in Florence, December 14–15, 1998* (Florence: Le Lettere, 2000), 89–97.

“La collezione degli strumenti scientifici del MAST” (in Italian and Portuguese), in *Inventário da coleção de instrumentos científicos do Museu de Astronomia e Ciências Afins* (Rio de Janeiro: MAST, Coordenação de Museologia, 2000), 6–10.

“L’evoluzione degli strumenti ottici nell’Ottocento,” *Atti della Fondazione Giorgio Ronchi* 55, no. 4–5 (2000), Special issue: *Atti del convegno Lottica in Italia tra Otto e Novecento: Un contributo alla storia della scienza e della tecnica: Archivio di Stato di Firenze, 22–23 aprile 1999*, eds. Emilio Capannelli and Elisabetta Insabato, 621–651.

“Historische Instrumente als materielle Zeugen der Wissenschaftsgeschichte,” in *Instrument-Experiment: Historische Studien*, ed. Christoph Meinel (Berlin: Verlag für Geschichte der Naturwissenschaften und der Technik, 2000), 74–81.

“Les instruments électriques des XVIIIe et XIXe siècles: Histoire, évolution, design,” *Technè* 12 (2000): 9–17.

"Museum Report, Instruments in South America: The Collection of the Museu de Astronomia e Ciências Afins of Rio de Janeiro," *Bulletin of the Scientific Instrument Society* 65 (2000): 25–28.

"Old Artifacts and New Challenges: The Future of History," *Europhysics News* 31, no. 3 (2000): 16.

"Les outils des électriciens du xviii^e siècle," *La revue, Musée des Arts et Métiers* 31 (2000): 10–19.

Gli strumenti di fisica dell'Istituto Tecnico Toscano: Eletticità e magnetismo (Florence: Le Lettere, 2000).

2001

"1800–1900: Un secolo di strumenti per lo studio dell'acustica = 1800–1900: A Century of Instruments for the Study of Acoustics," in *L'acustica e i suoi strumenti: La collezione dell'Istituto Tecnico Toscano = Acoustics and its Instruments: The Collection of the Istituto Tecnico Toscano*, eds. Anna Giatti and Mara Miniati (Florence: Giunti, 2001), 57–72.

"Anecdotal Instruments: An Unusual Electric Tester," *Bulletin of the Scientific Instrument Society* 69 (2001): 9.

"The Arms of the Physicist: Volta and Scientific Instruments," with Giuliano Bellodi, in *Nuova Voltiana: Studies on Volta and His Times*, eds. Fabio Bevilacqua and Lucio Fregonese (Milan: U. Hoepli, 2000–2003), v. 3 (2001), 1–40.

"Le cabinet de physique d'Alessandro Volta a Pavie," *Sartoniana* 14 (2001): 57–75.

"Catalogo = Catalogue," in *L'acustica e i suoi strumenti: La collezione dell'Istituto Tecnico Toscano = Acoustics and Its Instruments: The Collection of the Istituto Tecnico Toscano*, eds. Anna Giatti and Mara Miniati (Florence: Giunti, 2001), 73–138. (Revised and expanded version of Paolo Brenni, *Gli strumenti del Gabinetto di Fisica dell'Istituto Tecnico Toscano: 1, Acustica*, 1986).

"La conquête de la précision dans les sciences et l'industrie: Deux siècles de mesures de longueur," in *Colloque Photomécanique 2001: Journées organisées les 24, 25 et 26 avril 2001 à Poitiers* (Malakoff: GAMAC, 2001), I–XII.

Histoires de recherche: 1960–2000, with Gérard Emptoz and Bruno Jacomy, 1 DVD ([n.pl.]: IHT Atlantech, 2001).

"The Ramsden Circle at the Palermo Astronomical Observatory," with Ileana Chinnici and Giorgio Foderà Serio, *Bulletin of the Scientific Instrument Society* 71 (2001): 2–10.

"The Restoration of Three Large Instruments of the Palermo Astronomical Observatory," with Ileana Chinnici and Giorgio Foderà Serio, *Bulletin of the Scientific Instrument Society* 71 (2001): 11–16.

"Un siècle d'instruments: La transformation des appareils scientifiques et leur utilisation pendant le xxe siècle," *Sartoniana* 14 (2001): 13–56.

2002

- "19th Century Scientific Instrument Advertising," *Nuncius* 17, no. 2 (2002): 497–513.
- "Le braccia del fisico: Volta e il gabinetto scientifico settecentesco," in *Correnti elettriche e illuminismo scientifico*, ed. Corrado Sinigaglia (Milan: FrancoAngeli, 2002), 92–99.
- "Il Gabinetto di Fisica. Genesi e sviluppo (1771–1819): Strumenti, viaggi, costruttori, artigiani, governanti e finanziamenti," with Giuliano Bellodi, in *Gli strumenti di Alessandro Volta: Il Gabinetto di Fisica dell'Università di Pavia*, eds. Giuliano Bellodi and others (Milan: U. Hoepli, 2002), 13–34.
- "La industria de precisión en el siglo XIX: Una panorámica de los instrumentos, los constructores y el mercado en diferentes contextos nacionales," in *Abriendo las cajas negras: Colección de instrumentos científicos de la Universitat de València*, eds. José Ramón Bertomeu Sánchez and Antonio García Belmar (València: Universitat de València y Fundació General de la Universitat de València, 2002), 53–72; Engl. transl., "The Nineteenth Century Precision Instrument Industry: A Panorama of Instruments, Their Makers and the Market in Different Countries," *ibid.*, 425–433.
- "The Italian Scientific Instrument Heritage: An Impossible Inventory?," in *Proceedings of the xxth International Congress of History of Science, Liège, 20–26 July 1997* (Turnhout: Brepols, 1999–2002), v. 16: *Scientific Instruments and Museums*, ed. Maurice Dorikens (2002), 191–197.
- "Jean Antoine Nollet and Physics Instruments," in *The Art of Teaching Physics: The Eighteenth Century Demonstration Apparatus of Jean Antoine Nollet*, eds. Lewis Pyenson and Jean-François Gauvin (Sillery, Quebec: Septentrion, 2002), 11–27; French transl., "Jean-Antoine Nollet et les instruments de physique expérimentale," in *L'art d'enseigner la physique: Les appareils de démonstration de Jean-Antoine Nollet (1700–1770)*, eds. Lewis Pyenson and Jean-François Gauvin (Sillery, Quebec: Septentrion, 2002), 11–27.
- "Note sulla fabbricazione e sulla lavorazione del vetro ottico," in *Gli occhiali presi sul serio: Arte, storia, scienza e tecnologia della visione*, ed. Raimonda Riccini (Milan: Silvana, 2002), 165–171.
- Strumenti scientifici: Dal museo al laboratorio interattivo: Il caso di Como Città della scienza* (Como: Centro di Cultura Scientifica A. Volta, 2002).
- "La valorisation du patrimoine astronomique à travers quelques exemples italiens," *Lettre de l'OCIM* 84 (2002): 33–38.
- "Who Made What? The Dilemma of Signed Instruments," in *XVIII International Scientific Instrument Symposium: Proceedings: Moscow, St. Petersburg, Russia, 20–25 September 1999* (Moscow: Scientific Publishing Center "Engineer," 2002), 50–66.

2003

- "Battery—Electrical Machine—Electrotechnology—Instruments, Electrical Measuring—Polarimeter," in *The Oxford Companion to the History of Modern Science*, ed.

John L. Heilbron (Oxford: Oxford University Press, 2003), 82–83; 234; 243–244; 413–415; 659.

“Volta’s Electric Lighter and Its Improvements: The Birth, Life and Death of a Peculiar Scientific Apparatus Which Became the First Electric Household Appliance,” in *Musa Musaei: Studies on Scientific Instruments and Collections in Honour of Mara Miniati*, eds. Marco Beretta, Paolo Galluzzi, and Carlo Triarico (Florence: L.S. Olschki, 2003), 371–394.

2004

“Dal Crystal Palace al Palais de l’Optique: La scienza alle esposizioni universali, 1851–1900,” *Memoria e ricerca* 12, no. 17 (2004), Special issue: *Esposizioni in Europa tra Otto e Novecento: Spazi, organizzazione, rappresentazioni*, 35–63.

L’Europe des découvertes, ed. David Jasmin, foreword by Paolo Brenni (Paris: Le Pomnier, 2004).

“Mechanical and Hydraulic Models for Illustrating Electromagnetic Phenomena,” *Nuncius* 19, no. 2 (2004): 629–657.

“Mystery Object Answered: The Helmholtz Myograph,” *Bulletin of the Scientific Instrument Society* 78 (2004): 34.

2005

“The Historical Heritage of Italian Astronomy,” in *Cento anni di astronomia in Italia, 1860–1960: Convegno organizzato d’intesa con l’Istituto Nazionale di Astrofisica e il Comitato Nazionale per il IV Centenario della Fondazione dell’Accademia dei Lincei, Roma, 26–28 marzo 2003* (Rome: Bardi, 2005), 417–427.

“L’importance des instruments scientifiques comme témoignages matériels de l’histoire des sciences et des techniques,” in *Le patrimoine scientifique et technique contemporain: Un programme de sauvegarde en Pays de la Loire*, eds. Catherine Cuenca and Yves Thomas (Paris: L’Harmattan, 2005), 29–40.

“Il restauro degli strumenti scientifici: Alcune considerazioni,” in *Strumentazione scientifica: Conservare ed esporre*, eds. Laura Ronzon and Salvatore Sutera (Milan: Museo Nazionale della Scienza e della Tecnologia Leonardo da Vinci, 2005), 50–56.

2006

“The Annual Invitation Lecture: Artist and Engineer: The Saga of 19th Century French Precision Industry,” *Bulletin of the Scientific Instrument Society* 91 (2006): 2–11.

“Dumotiez and Pixii: The Transformation of French Philosophical Instruments,” *Bulletin of the Scientific Instrument Society* 89 (2006): 10–16.

“Good News from Rio de Janeiro: The Restoration of the Large Meridian Circle of the Museu de Astronomia e Ciências Afins,” *Bulletin of the Scientific Instrument Society* 88 (2006): 46–47.

"The Physics Collection of the Istituto Tecnico Toscano: 20 Years of Work," in *Proceedings of the xxv Scientific Instrument Symposium: East and West, the Common European Heritage: Jagiellonian University Museum, Krakow, Poland, 10–14 September 2006* (Krakow: Jagiellonian University Museum, 2006), 215–218.

"Quelques considérations sur la conservation des instruments scientifiques," *CoRé* 17 (2006): 8–11.

2007

"Foucault nella Cattedrale d'Arezzo," with Massimo Mazzoni, *Giornale di astronomia* 33, no. 2 (2007): 23–28.

"Helio-stat Revisited: A Curious Application of an Old Instrument," *Bulletin of the Scientific Instrument Society* 93 (2007): 11.

"Les outils de Prométhée," in *Benjamin Franklin, homme de science, homme du monde: Exposition du 4 décembre 2007 au 30 mars 2008: Conservatoire National des Arts et Métiers, Paris*, ed. Anne-Catherine Hauglustaine (Paris: Paris Musées, 2007), 125–141.

"Silbermann's Didactic Painting in the University of Mississippi Museum," *Bulletin of the Scientific Instrument Society* 95 (2007): 2–6.

"Trinta anos de atividade: Instrumentos científicos de interesse histórico," in *Caminho para as estrelas: Reflexões em um museu*, ed. Ana Maria Ribeiro de Andrade (Rio de Janeiro: MAST, Coordenação de Museologia, 2007), 179–192.

"Uranium Glass and Its Scientific Uses," *Bulletin of the Scientific Instrument Society* 92 (2007): 34–39.

2008

"Le collezioni di strumenti scientifici nelle scuole," *Annali di storia dell'educazione e delle istituzioni scolastiche* 15 (2008): 145–148.

"Formas de utilizar el patrimonio científico," in *El patrimonio científico: ¿conservado o fosilizado?*, 2 DVD (Madrid: Ministerio de Ciencia e Innovación, Secretaría General Técnica, 2008).

"Grosse Erwartungen: Zu Funktionsstörungen experimenteller Instrumente," in *Spuren der Avantgarde: Theatrum machinarum: Frühe Neuzeit und Moderne im Kulturvergleich*, eds. Helmar Schramm, Ludger Schwarte, and Jan Lazardzig (Berlin: W. de Gruyter, 2008), 103–121.

"Keine staubigen Aufbewahrungsorte: Wissenschaftsmuseen, Science Center, Universitätssammlungen," in *Wissenschaft kommunizieren: Die Rolle der Universitäten: Dokumentation des Symposiums Wissenschaftskommunikation im öffentlichen Raum, welche Rolle spielen die Universitäten?, 12. bis 13. April 2007, Berlin-Brandenburgische Akademie der Wissenschaften, Berlin*, eds. Anita Hermannstädter, Michael Sonnabend, and Cornelia Weber (Essen: Edition Stifterverband, 2008), 102–107.

"Lichtenberg's Figures," *Bulletin of the Scientific Instrument Society* 96 (2008): 1.

"The Possible Uses of University Scientific Instrument Collections," *Rittenhouse* 22, no. 2 (2008), Special issue: *Scientific Instrument Collections in Universities: Teaching with University Collections*, 211–224.

"The Telephone: An Invention with Many Fathers," Conference Paper (2008), https://www.researchgate.net/publication/236576160_The_Telephone_An_Invention_with_Many_Fathers, accessed January 12, 2022.

2009

Bookmarks: Wissenswelten von der Keilschrift bis YouTube, 16. Januar bis 15. Februar 2009: Publikation Anlässlich der Ausstellung in der Kestnergesellschaft vom 16. Januar bis 15. Februar 2009, in Kooperation mit der Gottfried-Wilhelm-Leibniz-Bibliothek, with others (Heidelberg: Kehrler, 2009).

"Dal laboratorio all'officina: La nascita della strumentazione elettrica per misure industriali, 1870–1900," in *Storia della tecnica elettrica*, eds. Virginio Cantoni and Andrea Silvestri (Milan: Cisalpino, 2009), 101–135.

European Collections of Scientific Instruments, 1550–1750, ed. Giorgio Strano, foreword by Paolo Brenni (Leiden; Boston: Brill, 2009).

"Il Gabinetto di Fisica del Liceo Sarpi di Bergamo: Due secoli di strumenti," in Laura Serra Perani, *Gli strumenti del Gabinetto di Fisica del Liceo classico Paolo Sarpi di Bergamo* (Bergamo: Associazione Ex Alunni del Liceo Classico Paolo Sarpi, 2009), 11–14.

Il Gabinetto di Fisica dell'Istituto Tecnico Toscano: Guida alla visita (Florence: Polistampa, 2009).

"Non solo astronomia," in *Astrum 2009, Astronomia e strumenti: Il patrimonio storico italiano quattrocento anni dopo Galileo*, ed. Ileana Chinnici (Vatican City: Musei Vaticani, 2009), 108–115; 223–235.

"Prometheus' Tools: Instruments and Apparatus used in Atmospheric Electricity Research and Experiments," in *Playing with Fire: Histories of the Lightning Rod*, eds. Peter Heering, Oliver Hochadel, and David J. Rhees (Philadelphia: American Philosophical Society, 2009), 230–255.

"Scientific Instruments and Tools," in *The Palgrave Dictionary of Transnational History: From the Mid-19th Century to the Present Day*, eds. Akira Iriye and Pierre Yves Saunier (Basingstoke: Palgrave, 2009), 929–932.

"Telegrafia e apparecchi telegrafici nell'Italia di metà Ottocento," in *Antonio Meucci e la città di Firenze: Tra scienza, tecnica e ingegneria*, eds. Franco Angotti and Giuseppe Pelosi (Florence: Firenze University Press, 2009), 123–133.

2010

"Considerações sobre o restauro de instrumentos científicos," *Museologia, Instituto dos Museus e da Conservação* 4 (2010): 198–206.

"Les courants à haute-fréquence apprivoisés à travers la darsonvalisation et les specta-

- cles publics (1890–1930),” *Annales historiques de l’électricité* 8 (2010), Special issue: *Le corps humain et l’électricité*, 53–71.
- “For a Dictionary of French Scientific Instrument Makers,” *Bulletin of the Scientific Instrument Society* 104 (2010): 9–11.
- “From the ‘Chain of Leyden Jars’ to the Marx Generator: 100 Years of Voltage Multiplier,” *Bulletin of the Scientific Instrument Society* 107 (2010): 2–9.
- “L’industria degli strumenti di precisione,” in *Museo Galileo: Capolavori della scienza*, ed. Filippo Camerota (Florence: Giunti, 2010), 242–255; Eng. transl., “The Precision Instrument Industry,” in *Museo Galileo: Masterpieces of Science*, ed. Filippo Camerota (Florence: Giunti, 2010), 242–255.
- “L’industria degli strumenti di precisione,” in *Museo Galileo: Guida ai tesori della collezione*, ed. Filippo Camerota (Florence: Giunti, 2010), 78–83; Eng. transl., “The Precision Instrument Industry,” in *Museo Galileo: A Guide to the Treasures of the Collection*, ed. Filippo Camerota (Florence: Giunti, 2010), 78–83; French transl., “L’industrie des instruments de précision,” in *Museo Galileo: Guide des trésors du musée*, ed. Filippo Camerota (Florence: Giunti, 2012), 78–83; Spanish transl., “La industria de los instrumentos de precisión,” in *Museo Galileo: Guía de los tesoros de la colección*, ed. Filippo Camerota (Florence: Giunti, 2012), 78–83; German transl., “Die Produktion von Präzisionsinstrumenten,” in *Museo Galileo: Führer zu den Schätzen der Sammlung*, ed. Filippo Camerota (Florence: Giunti, 2014), 78–83.
- “L’insegnamento delle scienze,” in *Museo Galileo: Capolavori della scienza*, ed. Filippo Camerota (Florence: Giunti, 2010), 228–241; Eng. transl., “Teaching and Popularizing Science,” in *Museo Galileo: Masterpieces of Science*, ed. Filippo Camerota (Florence: Giunti, 2010), 228–241.
- “L’insegnamento delle scienze,” in *Museo Galileo: Guida ai tesori della collezione*, ed. Filippo Camerota (Florence: Giunti, 2010), 72–77; Eng. transl., “Teaching and Popularizing science,” in *Museo Galileo: A Guide to the Treasures of the Collection*, ed. Filippo Camerota (Florence: Giunti, 2010), 72–77; French transl., “L’enseignement des sciences,” in *Museo Galileo: Guide des trésors du musée*, ed. Filippo Camerota (Florence: Giunti, 2012), 72–77; Spanish transl., “La enseñanza de las ciencias,” in *Museo Galileo: Guía de los tesoros de la colección*, ed. Filippo Camerota (Florence: Giunti, 2012), 72–77; German transl., “Die wissenschaftliche Lehre,” in *Museo Galileo: Führer zu den Schätzen der Sammlung*, ed. Filippo Camerota (Florence: Giunti, 2014), 72–77.
- “Misurare i fenomeni naturali,” in *Museo Galileo: Capolavori della scienza*, ed. Filippo Camerota (Florence: Giunti, 2010), 256–269; Eng. transl., “Measuring Natural Phenomena,” in *Museo Galileo: Masterpieces of Science*, ed. Filippo Camerota (Florence: Giunti, 2010), 256–269.
- “Misurare i fenomeni naturali,” in *Museo Galileo: Guida ai tesori della collezione*, ed. Filippo Camerota (Florence: Giunti, 2010), 84–87; Eng. transl., “Measuring Natural Phenomena,” in *Museo Galileo: A Guide to the Treasures of the Collection*, ed. Filippo

- Camerota (Florence: Giunti, 2010), 84–87; French transl., “Mesurer les phénomènes naturels,” in *Museo Galileo: Guide des trésors du musée*, ed. Filippo Camerota (Florence: Giunti, 2012), 84–87; Spanish transl., “Medir los fenómenos naturales,” in *Museo Galileo: Guía de los tesoros de la colección*, ed. Filippo Camerota (Florence: Giunti, 2012), 84–87; German transl., “Die Messung der Naturphänomene,” in *Museo Galileo: Führer zu den Schätzen der Sammlung*, ed. Filippo Camerota (Florence: Giunti, 2014), 84–87.
- “Le rôle des collectionneurs privés dans la sauvegarde du patrimoine scientifique et technique,” in *Le patrimoine scientifique et technique: Un projet contemporain*, eds. Catherine Ballé, Catherine Cuenca, and Daniel Thoulouze (Paris: La Documentation Française, 2010), 163–170.
- “Sale XII e XIII, L’insegnamento delle scienze,” in *Museo Galileo: Museo virtuale* (2010), <https://catalogo.museogalileo.it/sala/SaleXIXIII.html>, accessed January 12, 2022; Eng. transl., “Rooms XII and XIII, Teaching and Popularizing Science,” in *Museo Galileo: Virtual Museum* (2010), <https://catalogue.museogalileo.it/room/RoomsXIXI.html>, accessed January 12, 2022.
- “Sala XIV, L’industria degli strumenti di precisione,” in *Museo Galileo: Museo virtuale* (2010), <https://catalogo.museogalileo.it/sala/SalaXIV.html>, accessed January 12, 2022; Eng. transl., “Room XIV, The Precision Instrument Industry,” in *Museo Galileo: Virtual Museum* (2010), <https://catalogue.museogalileo.it/room/RoomXIV.html>, accessed January 12, 2022.
- “Sale xv e xvi, Misurare i fenomeni naturali,” in *Museo Galileo: Museo virtuale* (2010), <https://catalogo.museogalileo.it/sala/SaleXVXVI.html>, accessed January 12, 2022; Eng. transl., “Rooms xv and xvi, Measuring Natural Phenomena,” in *Museo Galileo: Virtual Museum* (2010), <https://catalogue.museogalileo.it/room/RoomsXVXVI.html>, accessed January 12, 2022.
- “La science française au Crystal Palace,” *Documents pour l’histoire des techniques* 19 (2010), Special issue: *Les techniques et la technologie entre la France et la Grande-Bretagne, XVIIe–XIXe siècles*, 255–265.
- “Strumenti scientifici,” in *Pinacoteca Ambrosiana* (Milan: Electa, 2005–2010), v. 6: *Collezioni Settala e Litta Modignani: Arti applicate da donazioni diverse, numismatica* (2010), 62–74.
- “Wilhelm Tempel and His 10.8 cm Steinheil Telescope,” with Simone Bianchi, Antonella Gasperini, Daniele Galli, Francesco Palla, and Anna Giatti, *Journal of Astronomical History and Heritage* 13, no. 1 (2010): 43–58.
- “Wilhelm Tempel and His Private Telescope,” in *Astronomy and Its Instruments before and after Galileo: Proceedings of the Joint Symposium Held in Venice, San Servolo Island, Italy, 28 September–2 October 2009*, eds. Luisa Pigatto and Valeria Zanini (Padua: CLEUP, 2010), 181–190.

2011

- "The Evolution of Teaching Instruments and Their Use between 1800 and 1930," in *Learning by Doing: Experiments and Instruments in the History of Science Teaching*, eds. Peter Heering and Roland Wittje (Stuttgart: F. Steiner, 2011), 281–315.

2012

- "The Birth of Museums of the History of Science," *Annali del Laboratorio museotecnico* 5 (2012), Special issue: *Displaying Scientific Instruments: From the Medici Wardrobe to the Museo Galileo*, 57–73.
- "The Cumbersome Heritage: Is there a Future for University Collections? A Few Informal Suggestions," in *Arranging and Rearranging: Planning University Heritage for the Future: Papers presented at the XII Universeum Network Meeting: University of Padua, Italy, 26–29 May 2011*, eds. Sofia Talas and Marta C. Lourenço (Padua: Padova University Press, 2012), 15–21.
- "Effets spéciaux! Science et technique au service des attractions de l'Exposition Universelle de 1900," in *Les expositions universelles en France au XIX^e siècle: Techniques, publics, patrimoines*, eds. Anne-Laure Carré and others (Paris: CNRS, 2012), 75–90.
- "The Evolution of Teaching Instruments and Their Use between 1800 and 1930," *Science & Education* 21, no. 2 (2012), Special issue: *The History of Experimental Science Teaching*, eds. Peter Heering and Roland Wittje, 191–226.
- "The Fraunhofer's Refractor of Tartu (Dorpat) and its Restoration," *Bulletin of the Scientific Instrument Society* 113 (2012): 2–8.
- Museo Galileo: Museo virtuale*, ed. Paolo Galluzzi, with the collaboration of Paolo Brenni and others, 1 DVD (Florence: Museo Galileo, 2012); Engl. transl., *Museo Galileo: Virtual Museum*, ed. Paolo Galluzzi, with the collaboration of Paolo Brenni and others, 1 DVD (Florence: Museo Galileo, 2012).
- "Strumenti scientifici: Objects reading e didattica informale," with Silvana Barbacci and Anna Giatti, in *Pianeta Galileo 2011*, ed. Alberto Peruzzi (Florence: Consiglio Regionale della Toscana, 2012), 183–198.
- "Two Photographs Presented by the Cabinet of Physics of the University of Padua at the Special Loan Collection of Apparatus of 1876," *Bulletin of the Scientific Instrument Society* 112 (2012): 2–3.
- "The Water Hammer," *Bulletin of the Scientific Instrument Society* 115 (2012): 12–17.

2013

- "Étincelles et ondes: Les expériences de E. Sarasin et L. de la Rive sur les ondes électromagnétiques," *Archives des sciences* 66 (2013): 201–210.
- "From Workshop to Factory: The Evolution of Instrument-Making Industry, 1850–1930," in *The Oxford Handbook of the History of Physics*, eds. Jed Z. Buchwald and Robert Fox (Oxford: Oxford University Press, 2013), 584–650.

"Gerard L'Estrange Turner, 22 January 1926–19 July 2012," *Nuncius* 28, no. 1 (2013): 217–222.

"Johann A. Natterer (1821–1900) and his Pumps for Liquifying Gases," *Bulletin of the Scientific Instrument Society* 117 (2013): 2–8.

"The Physics Cabinet of the Istituto Tecnico Toscano," in *Cabinets of Experimental Philosophy in Eighteenth-Century Europe*, eds. Jim Bennett and Sofia Talas (Leiden: Brill, 2013), 215–241.

"Gli strumenti della scienza e la loro produzione," in *Enciclopedia italiana di scienze, lettere ed arti. Ottava appendice: Il contributo italiano alla storia del pensiero. Tecnica*, eds. Vittorio Marchis and Francesco Profumo (Rome: Istituto della Enciclopedia Italiana, 2013), 101–112.

2014

"Cenni sui costruttori di strumenti meteorologici," in *Dal cielo alla Terra: Italia: Meteorologia e sismologia dall'Ottocento a oggi*, ed. Graziano Ferrari (Bologna: Bononia University Press, 2014), 35–43.

"The Forgotten Instruments of Luigi Lavizzari (1814–1875)," *Bulletin of the Scientific Instrument Society* 120 (2014): 37–42.

"Officine Galileo: 150 anni di storia e tecnologia," Museo Galileo (2014), <https://mostre.museogalileo.it/officinegalileo/indice.html>, accessed January 12, 2022.

"Gli strumenti scientifici," in *Il Settecento: Il secolo delle rivoluzioni*, ed. Umberto Eco (Milan: Encyclomedia, 2014), v. 1: *Storia, filosofia, scienze e tecniche*, 540–545.

2015

"The Palermo Merz Equatorial Telescope: An Instrument, a Manuscript, some Drawings," with Ileana Chinnici, *Nuncius* 30, no. 1 (2015): 228–279.

"Quelques considérations sur les collections historiques d'instruments de physique de l'Université de Lille," *Les Nouvelles d'Archimède* 71 (2015): 20–21.

"Universal and International Exhibitions and the Birth of Museums of History of Sciences and Technology," *Ricerche storiche* 45, no. 1–2 (2015), Special issue: *Esposizioni universali in Europa: Attori, pubblici, memorie tra metropoli e colonie, 1851–1939*, eds. G.L. Fontana and A. Pellegriano, 115–129.

"Very Large Induction Coils," *Bulletin of the Scientific Instrument Society* 125 (2015): 1–13.

2016

"Instruments, Tools and Materials: The Inventories of the Workshops of Two Important Instrument Makers: Jules Duboscq and Heinrich Ruhmkorff," *Nuncius* 31, no. 3 (2016), Special issue: *The Varied Role of the Amateur in Early Modern Europe*, 611–646.

"L'Istituto Tecnico di Firenze alle esposizioni universali dell'Ottocento," with Laura Faustini and Elena Mechi, in *Una capitale per l'Italia: Firenze 1865–1871*, eds. Monika

Poettinger and Piero Roggi (Bagno a Ripoli: Opificio, 2016), 167–185; Eng. transl., “The Istituto Tecnico di Firenze and Universal Exhibitions,” in *Florence, Capital of the Kingdom of Italy, 1865–71*, eds. Monika Poettinger and Piero Roggi (London: Bloomsbury, 2018), 95–106.

“Mystery Object 1: The Dust Counter of John Aitken,” *Bulletin of the Scientific Instrument Society* 131 (2016): 30–31.

“La production française d’instruments de physique au XIXe siècle: Évolution, constructeurs, fabrication, commerce,” in *Encyclopédie des instruments de l’enseignement de la physique du XVIIIe au milieu du XXe siècle*, ed. Francis Gires (Niort: ASEISTE, 2016), 109–153.

2017

“Big Is Beautiful: A Few Considerations About the Making of the Large 19th Century Refractors,” in *Merz Telescopes: A Global Heritage Worth Preserving*, ed. Ileana Chini (Cham: Springer, 2017).

How Scientific Instruments Have Changed Hands, ed. with A.D. Morrison-Low and Sara J. Schechner (Leiden: Brill, 2017).

“The Pneumatic Pump of the Mariano College in Bergamo,” with Anna Giatti and Laura Serra, in *Società Italiana degli Storici della Fisica e dell’Astronomia: Atti del XXXVII convegno annuale = Proceedings of the 37th annual conference: Napoli 2016*, ed. Salvatore Esposito (Pavia: Pavia University Press, 2017), 371–379.

“Ronchi, Vasco,” in *Dizionario biografico degli italiani* (Roma: Istituto della Enciclopedia Italiana, 1960–), v. 88 (2017).

“Some Considerations about the Prices of Physics Instruments in the Nineteenth Century,” in *How Scientific Instruments Have Changed Hands*, eds. Alison D. Morrison Low, Sara J. Schechner, and Paolo Brenni (Leiden: Brill, 2017), 57–87.

“Swiss Excellence: Gottlieb Coradi and His Instruments,” *Bulletin of the Scientific Instrument Society* 135 (2017): 14–25.

“Very Large Induction Coils,” in *Proceedings of the First International Conference on the History of Physics: Trinity College, Cambridge, 4–5 September 2014: with the Main Focus “Electromagnetism: The Road to Power”*, eds. Malcolm J. Cooper, Edward A. Davis, Peter M. Schuster, and Denis L. Weaire (Pöllauberg: Living Edition, 2017), 163–198.

2018

“Dictionary of Precision Instrument-Makers and Related Craftsmen: A Bio-Bibliographical Dictionary of Precision Instrument-Makers and Related Craftsmen in France & Switzerland, 1430–1960,” with Denis Beaudouin and Anthony Turner (2018), <https://omekas.obspm.fr/s/dictionarypim/page/prolegomena>, accessed January 12, 2022.

"Il Gabinetto di Fisica," with Anna Giatti, in *Fondazione Scienza e Tecnica: Guida al museo*, eds. Simonetta Soldani and Donatella Lippi (Florence: Giunti, 2018), 54–63.

"Paris capitale de l'industrie de précision au XIXe siècle," in *La collection de Ruedi Bebie: Sciences et techniques au Musée Bernard d'Agesci*, ed. Laurence Lamy (La Crèche: La Geste, 2018), 10–15.

2019

"Prizes, Medals and Honourable Mentions: How Instrument Makers Were Rewarded at 19th-Century Exhibitions," *Nuncius* 34, no. 2 (2019), Special issue: *Prizes and Awards in Science before Nobel*, 392–420.

"Valorizzazione di una collezione scientifica: Museo e istituzioni collaborano," *Museologia scientifica. Memorie* 19 (2019): 25–29.

2020

"Written by Lightning: A Short Story of Lightning Recorders: Ceraunographs, Electrographs, Klydonographs. Part 1. From Beccaria's Ceraunograph to Gergely Palatin's Detector," *Bulletin of the Scientific Instrument Society* 145 (2020): 2–10.

"Written by Lightning: A Short Story of Lightning Recorders: Ceraunographs, Electrographs, Klydonographs. Part 2. From Lancetta's Electrograph to Peters's Klydonograph and Its Improvements," *Bulletin of the Scientific Instrument Society* 146 (2020): 24–33.

2021

"La collezione di strumenti scientifici del Museo Civico di Modena," *Taccuini d'arte* 13 (2021): 95–103.

"A Dictionary of French Instrument-Makers: Recent Developments," *Bulletin of the Scientific Instrument Society* 151 (2021): 28.

"Filming Nineteenth Century Physics Demonstrations with Historical Instruments," in *Historical Scientific Instruments in Contemporary Education*, eds. Elizabeth Cavicchi and Peter Heering (Leiden, Brill, 2021), 34–49.

"The Production and Trade of Scientific Instruments (1750–1950)," in *New Frontiers for Metrology: From Biology and Chemistry to Quantum and Data Science*, eds. M.J.T. Milton, D.S. Wiersma, C.J. Williams, and M. Segà (Bologna: Società Italiana di Fisica; Amsterdam, Washington: IOS Press, 2021), 149–153.

"Salleron and Dujardin: A Long-Lasting Story in the Recent History of Scientific Instrument Industry," *Bulletin of the Scientific Instrument Society* 150 (2021): 4–11.

"Secchi's Meteorographs Outside of Italy," in eds. Ileana Chinnici and Guy Consolmagno, *Angelo Secchi and Nineteenth Century Science: The Multidisciplinary Contributions of a Pioneer and Innovator* (Cham: Springer, 2021), 175–194.

2022

The Arsenal of Eighteenth-Century Chemistry: The Laboratories of Antoine Laurent Lavoisier (1743–1794), with Marco Beretta (Leiden: Brill, forthcoming in 2022).