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BOOK OF ABSTRACTS

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From INAC to Brazil, Luigi Sobrero and the teaching of Mathematical Physics in Rio de Janeiro

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From the 1930s onward, the National Institute for the Application of Calculus (INAC), founded by Mauro Picone, represented the leading Italian institution for applied research. Mathematical research was mainly oriented towards problems of stability and elasticity in construction science and statics and dynamics of aeronautical constructions. During this decade the Institute gradually consolidated its role of "hotbed of new talents" and brought together a number of talented young researchers that found here the opportunity to begin their research careers. Among the ordinary consultants of INAC of the four-year period 1933-1937 there was Luigi Sobrero (1909-1979), who was awarded an Engineering degree from the University of Rome in 1931 and a Mathematics degree two years later. Soon after obtaining a lecturing post in Mechanics and Construction Science, from 1935 to 1939 Sobrero was tenured professor in Mathematical Physics in Rome. The lithographed edition of his lessons, given in Rome in the academic year 1935-1936 has been published under the title *Lezioni di fisica matematica: anno accademico 1935-36*.

In 1939 Sobrero was invited to assume the chair of Mathematical Physics at the newly established National Faculty of Philosophy of Rio de Janeiro. The call of Sobrero, together with those of Gabriele Mammana (1893-1942) for Analysis and Achille Bassi (1907-1973) for Geometry, was part of the project of the Brazilian government for creating a new generation of Brazilian mathematicians, under the guidance of internationally renowned scholars that could start up a high-level tradition of local research. From 1939 to 1942 Sobrero was one of the «Professores estrangeiros contratados» of the National Faculty of Philosophy of Rio de Janeiro. He was entrusted with teaching the courses in «Fisica Teorica e Fisica Superior» (1939-1940) and in «Fisica General e Experimental e Fisica Matematica» (1941-1942). During his Brazilian stay Sobrero collected his lessons and published the handbook entitled *Elasticidade* (1942), in collaboration with two Brazilian students, Maria Laura Mouzinho Leite Lopes (1917-2013) and Leopoldo Nachbin (1922-1993).

In this talk we will discuss the figure of Luigi Sobrero and his first years of teaching of Mathematical Physics first in Rome, then in Rio de Janeiro, starting from the handbooks he prepared for his academical lessons. These books offer the opportunity not only to discuss about the fruitful collaboration of Sobrero with some of his most brilliant students, both in Italy and in Brazil, but also to underline the role played by the Laboratory of Applied Mathematics of the University of Rome and of the Laboratory of Experimental Physics of the University of Rio de Janeiro.

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Shaping topology across borders: Gino Fano and Achille Bassi in dialogue (1926–1945)

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This contribution investigates the scientific dissemination of topology by placing two historical moments of public lecturing in dialogue: a two-part lecture delivered by Gino Fano (1871–1952) in 1926, and the subsequent lecturing activities in Brazil of his former assistant, Achille Bassi (1907–1973), who served under Fano in Turin between 1933 and 1938.

- Fano’s 1926 lectures: Recently identified as unpublished minutes within the *Appunti vari* of the *Fondo Fano* at the Special Mathematics Library in Turin (cc. 139–142), these talks were delivered at the *Mathesis* society [4]. Here, Fano championed the transposition of the Göttingen model to Italy, framing topology through a Kleinian lens and exploring its links to classical algebraic geometry.
- Bassi’s Brazilian lectures: Reflecting a growing misalignment with an Italian environment that conceived topology merely as an auxiliary tool, Bassi relocated to Brazil in 1939. His dissemination program prominently featured a lecture on the role of topology in modern mathematics, delivered in 1940 as the inaugural address for his Higher Geometry course at the National Faculty of Philosophy and again in 1942 at the Italo-Brazilian Institute of High Culture [1]. This campaign further included his 1945 lecture series in Minas Gerais, which opened with a speech focusing on the necessity of disseminating modern mathematics [2].

By comparing these lectures, this contribution highlights how Fano and Bassi articulated different perspectives regarding the status and role of topology. Shared by a common dissemination purpose but separated by two decades, these differences stem not only from the rapid evolution of algebraic topology during the interwar period but also from a conceptual shift concerning the development of geometrical research itself. To contextualize this intellectual transition, these lectures are examined alongside the topological frameworks of contemporary figures such as Solomon Lefschetz, Oswald Veblen, and Francesco Severi [3, 5]—the latter having presented his own cycle of lectures on Topology at the Mathematical Seminar of Buenos Aires in 1930.

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Giacomo Albanese and the Italian Mission in Brazil

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Giacomo Albanese (1890 - 1947) was an Italian mathematician who worked in the field of algebraic geometry, known for introducing the so-called Albanese variety, although this attribution is dubious (Ciliberto - Sernesi 1996). Born in Geraci Siculo on July 11, 1890, after completing his early studies in Palermo, he was admitted in 1909 to the Scuola Normale Superiore in Pisa. There, he graduated in Mathematics in 1913 under the guidance of Ulisse Dini (1845 - 1918), Eugenio Bertini (1846 - 1933), and Luigi Bianchi (1856 - 1928). Shortly after, he was appointed as Dini's assistant and, upon Dini's death, he became an assistant to Onorato Nicoletti (1872 - 1929). In 1919, he became an assistant to Francesco Severi (1879 - 1961) in Padua, but held this position for only a few months because, in 1920, he took over the chair of Mathematical Analysis at the Naval Academy of Livorno. In 1925 he was appointed to the chair of Projective and Descriptive Geometry at the University of Catania, where he remained until 1927 when he transferred to Palermo. In 1929, he returned to Pisa, where he was entrusted with the chair of Analytical Geometry, remaining there until 1936. At that point, on the recommendation of Luigi Fantappiè (1901 - 1956), he was sent to Brazil to take part in what is remembered as the Italian Mission (*Missão Italiana*). This was a group of professors tasked with teaching several courses at the Faculty of Philosophy, Sciences, and Letters (FFCL), founded in 1934 at the University of São Paulo. Albanese remained there until 1942, when he had to return to Italy due to the events of World War II. He returned to São Paulo in 1946, where he died in 1947, at just 57 years old.

After presenting the figure of Giacomo Albanese and his contributions to the field of algebraic geometry, we will look at how he approached his role in Brazil. As a fervent supporter of the Scuola Normale of Pisa—which he described as the *greatest institution for preparation in high culture where the minds of young university students are systematically prepared for the deepest meditations*—and tasked with teaching Analytical and Projective Geometry as well as the History of Mathematics at the Brazilian University, he adopted a teaching method that was not limited to imparting crystallized notions. Instead, he also presented the most recent lines of research, showing the discipline as something in constant evolution. In accordance with this approach, he also took an active role in the activities of the Mathematics and Physics Seminar, which had been started by Fantappiè and Gleb Wataghin (1899 - 1986) in 1935, following the example of the seminars that had already become an established reality in Italy.

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An Italian voice in Brazil: the trajectory of Achille Bassi (1907-1973)

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This contribution examines the scientific and professional trajectory of Achille Bassi, a hitherto little-explored figure in the history of mathematics. Through the analysis of unpublished archival sources preserved across multiple institutions (Pisa, Turin, Rome, and Bologna), his scientific biography is reconstructed by highlighting its most significant milestones.

Although trained in the Italian School of algebraic geometry as an assistant to Francesco Severi and Gino Fano, Bassi distinguished himself through an early and profound interest in topology, a field he described as "little cultivated" in Italy at the time (A. Bassi to S. Pivano, February 5, 1937). Research periods at the Institute for Advanced Study in Princeton and at German universities (1935, 1939) brought him into contact with the most advanced currents in algebraic topology. These scholarly pursuits, combined with the profound historical and political upheavals of the 1930s, prompted his relocation to Brazil in 1939, where he was tasked with founding a new "mathematical school".

In South America, teaching activities were paired with a strong commitment to dissemination, and a definitive break from the Italian tradition was sealed by the decision to remain in Brazil even after winning a competition for a university chair in Italy.

Ultimately, Bassi's role as a "bridge" between two mathematical worlds offers new insights into the dynamics of knowledge circulation between Europe and South America, representing a foundational moment for Brazil's scientific development and illustrating a missed opportunity for Italian mathematics to renew itself through a dialogue between classical algebraic geometry and the emerging language of topology.

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A review of Gabriele Mammana's teaching and research activities between Italy and Brazil

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Gabriele Mammana [...] was one of those Sicilians whose gentle nature and absolute, unwavering commitment to fulfilling his duties, coupled with his devotion to Italy's national prestige, are a source of pride for his homeland. (Mauro Picone, Obituary of Gabriele Mammana)

Gabriele Mammana (1893–1942) was a Sicilian mathematician who made significant contributions to the theory of ordinary linear differential equations. Born in Gagliano Castelferrato, Enna, on 10 March 1893, he studied at the University of Pisa's Scuola Normale Superiore, graduating from there. After serving in the First World War, he became an assistant to Mauro Picone at the University of Catania, helping to establish the Seminario Matematico. Around 1925, he became a professor at the Naval Academy in Livorno. Shortly afterwards, he took up a position at the University of Cagliari. From 1930 to 1936, he taught at the University of Catania, serving as Dean of the Faculty of Mathematical, Physical, and Natural Sciences during the 1934–35 academic year. He then moved to the University of Naples. From 1939 to 1942, Mammana participated in the “Italian Mission” to Brazil, an international scientific project involving European countries and the emerging Brazilian academic community of the late 1930s. After arriving in Rio de Janeiro in August 1939 with other Italian professors, Mammana was appointed as a lecturer in Mathematical Analysis and Higher Analysis at the Faculdade Nacional de Filosofia da Universidade do Brasil (FNF-i-UB, now UFRJ). His courses were characterised by rigour and method rarely found in Brazilian curricula at that time. While in Brazil, the Sicilian mathematician did not confine himself to a purely didactic role; he sparked a keen interest in mathematical research, particularly in classical analysis and differential equations, among students and young lecturers. Among those influenced by his presence was Leopoldo Nachbin, who made a decisive contribution to the development of modern mathematics in Brazil and to the establishment of the Instituto de Matemática Pura e Aplicada (IMPA), and José Abdelhay, whose first research paper was inspired by Mammana's focus on specific problems in differential equations and the calculus of variations. Mammana was among the first foreign members to actively participate in the sessions of the Academia Brasileira de Ciências (ABC) and also contributed analytical papers to the ABC Annals. He was a corresponding member of the Royal Academy of Physical and Mathematical Sciences of Naples, as well as a full member of the Brazilian Academy of Sciences. He also exported the model of the Seminario Matematico of Catania in Brazil by founding the Círculo de Matemática e Física. Mammana returned to Italy in May 1942, after Brazil entered the Second World War on the side of the Allies and the contracts of Italian mathematicians were terminated. He died in Naples on 15 December 1942 following a relapse of a serious illness.

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Luigi Fantappiè, mathematics, and fascism in Brazil: when science diplomacy is not synonymous with cooperation (1934-1939)

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The Italian mathematician Luigi Fantappiè (1901-1956) was invited to participate in the organisation of the Department of Mathematics at the then recently founded University of São Paulo (USP) in 1934. He was part of a group of professors known as the Italian Mission, which was aligned with a broader foreign policy of the Fascist Italian government to promote the regime's cultural propaganda through science and university teaching. Mussolini's foreign policies considered Brazil an important target, because of the communities of Italian immigrants and their descendants who lived in the country since the late 19th century, especially in São Paulo city. USP founders were also interested in hiring university professors in Europe. As observed in historiography, Italian science and cultural diplomacy at the time were not based on cooperation principles, but on the dissemination of Italian values with the aim of spreading the fascist regime. In this talk, I will analyse how mathematics, university education, and politics shaped Fantappiè's career in Brazil during the five years he spent in the country. I intend to highlight how the circulation of books was one of Fantappiè's strategies for spreading Italian culture at the USP. His tactics included not only the dissemination of mathematical knowledge, but also of knowledge from other fields, including material politically aligned with fascism. As I will argue, Fantappiè's efforts were clearly and consciously part of Italian culture and science diplomacy at the time. Although Fantappiè participated in the shaping of the first generation of Brazilian mathematicians at the USP, his university and scientific work cannot be analysed separately from his political aspirations. The historical sources were collected at the following Brazilian and Italian historical archives: Italian Ministry of Foreign Affairs, Italian Central State Archive, São Paulo Public Archives, and Faculty of Philosophy, Sciences and Letters of USP Archives (CAPH/FFLCH).

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