

# ANTONIO FASANO

## List of Scientific Publications

### A - RESEARCH PAPERS

1. A. FASANO, Studio della distribuzione di temperatura in un involucro sferico omogeneo in moto traslatorio su un'orbita assegnata con condizioni termiche discontinue sul contorno, REND. IST. LOMB. ACCAD. SCI. LET. (A) 101 (1967), 65-74
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4. A. FASANO, Stime a priori per le soluzioni di un problema di tipo parabolico con condizioni al contorno non lineari., REND. IST. MAT. UNIV. TRIESTE 3 (1971), 1-12
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6. A. FASANO, Un esempio di controllo ottimale in un problema del tipo di Stefan., BOLL. UN. MAT. ITAL. (4) 4 (1971), 846-858
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11. C. BONACINA, G. COMINI, A. FASANO, M. PRIMICERIO, Numerical solution of phase-change problems, INT. J. HEAT MASS TRANSFER 16 (1973), 1825-1832
12. A. FASANO, M. PRIMICERIO, La diffusione del calore in uno strato di spessore variabile in presenza di scambi termici non lineari con l'ambiente, REND. SEM. MAT. UNIV. PADOVA 50 (1973), 269-330

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14. A. FASANO, Alcune osservazioni su una classe di problemi a contorno libero per l'equazione del calore, *LE MATEMATICHE* 29 (1974), 1-15
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16. A. FASANO, M. PRIMICERIO, Dipendenza continua della temperatura dai coefficienti termici in problemi di conduzione non lineari, *BOLL UN. MAT. ITAL. IV/9* (1974), 93-103
17. A. FASANO, M. PRIMICERIO, Viscoplastic impact of a rod on a wall, *BOLL. U.M.I.* (4) 11 (1975), 531-553
18. A. FASANO, M. PRIMICERIO, One-phase and two-phase free boundary problems of general type for the heat equation, *REND. ACCAD. NAZ. LINCEI* (8) 57 (1975), 387-390
19. J.R. CANNON, A. FASANO, A nonlinear parabolic free boundary problem, *ANN. MAT. PURA APPL.* (4) 112 (1975), 119-148
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NOTE: B30, B43, B49 are BOOK CHAPTERS.

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7. A. Fasano. Stationary temperature in a needle partially inserted in a partially heated body. FIAB internal report 2020/3
8. A. Fasano. Analysis of the literature concerning esophageal thermal monitoring during cardiac ablation (report for FDA). FIAB internal report 2021/1
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11. A. Fasano. Rationale about devices lifetime. FIAB internal report 2022/2
12. A. Fasano. About Sensitherm alarm thresholds. FIAB internal report 2022/3
13. A. Fasano, M. Corsi. Esophageal temperature monitoring: State of the art. FIAB internal report 2022/4
14. A. Fasano. Area of the lobed cross section of tubes for oxygen therapy. FIAB internal report 2022/5
15. A. Fasano, P. Martino. State of the art in electrosurgery. FIAB internal report 2022/6
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## C - BOOKS

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## D - LECTURE NOTES

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3. A. FASANO, Some free boundary problems with industrial applications, 29<sup>e</sup> Session Seminaire de Mathematiques Superieures, M.Delfour ed., Montreal NATO-ASI Series C: Math. Phys. Sci. 380 (1992) 113-142
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## **E - TEXTBOOKS**

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2. A. FASANO, S. MARMI, Meccanica Analitica con elementi di Meccanica Statistica e dei Continui, Bollati-Boringhieri, Torino, 1994.
3. A. FASANO, S. MARMI, Meccanica Analitica (nuova edizione). Bollati-Boringhieri, Torino, 2002
4. A. FASANO, S. MARMI, Analytical Mechanics, Oxford University Press (2006). Second (revised) edition 2013.

<p><b>PAPERS CLASSIFICATION BY SUBJECT</b> (if not differently specified numbers refer to the list A)</p>
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**1. Heat and/or mass transfer (no phase change)**

1, 2, 51, 223 + 2B1

**2. Parabolic equations (initial-boundary value problems)**

4, 7, 12, 16, 20, 92, 106, 164 (general theory) 2B, 2C

**3. Stefan problem and phase-change**

(see also: **Inverse problems; Numerical methods; Food Industry**)

6, 8, 10, 11, 13, 15, 20, 26, 30, 35, 86, 93, 155 + 1C, 2D, 3D, 7D

22, 32 (regularity)

33 (with concentrated capacity)

36, 52, 55 (with supercooling) + 9B

39 (irreversible)

40, 41, 48, 71 (mushy regions) + 3B, 1D

94 (freezing of dispersions)

133, 138, 143 + 37B (frying)

153 (carburizing of steel)

178, 184, 214 (geothermal reservoirs)

**4. Numerical methods for parabolic problems**

3, 10, 11, 13

**5. Inverse problems, control**

5, 6

**6. Other free boundary problems**

(see also **Fluid dynamics, Polymers, Porous media, Appl. to Medicine**)

9, 38, 46, 54, 174 (chemical reactions + combustions), 200 (vasomotion)

14, 18, 23, 24, 25, 34, 37 (general) + 1B, 5B

27, 28 (with Cauchy data)

92 (two-scale)

17 (viscoplastic impact)

120, 121, 131, 135, 137, 148, 149 (wax deposition in crude oils)

135, 168 (elastic materials with thresholds in constitutive equations) + 34B, 38B

163 (elastic-rigid materials) 169 (bone growth)

**7. Astronomy**

1, 2 (heat transfer in satellites)  
21 (micrometeorites)  
56, 58, 66 (outgassing)

## **8. Porous media**

(see also **Composites, Food Industry, Filters**)

29, 85 + 26B, 42B, 3C, 5C, 4D, 5D  
45, 70 (ground freezing, thawing), 179 (liquid-vapour)+ 4B  
95, 102, 105, 113, 117 (diapers)  
127, 156, 158, 176 + 36B (bioremediation)  
119 (rain infiltration in soils)  
164, 169 (flows with mass exchange) 161, 176 (erosion)  
171, 172, 177, 182 (water filtering) + 42B, 44B  
178, 184, 214 (geothermal reservoirs)

## **9. Composites**

109, 114, 116, 122 +10B, 14B

## **10. Fluid dynamics**

53, 59, 63, 75, 79 (Coal Water Slurries) + 12B, 18B, 6C  
69 (Bingham)  
64, 67, 98 (Hele-Shaw)  
154, 160 (glass fibers manufacturing)  
180, + 44B (porous ducts)  
194 peristalsis  
195 tapered partially porous tubes  
200, 201, 205, 210, 219 vasomotion

## **11. Oil industry – Geothermal energy**

89, 120, 121, 125, 131, 135, 148, (Waxy Crude Oils) + 11B, 12B, 27B, 33B, 35B, 40B, 41B  
178, 184 (geothermal reservoirs)

## **12. Polymers**

42, 43 (swelling of glassy polymer) + 2B  
61, 62, 74, 78, 81, 82, 87, 100 (polymer crystallization) + 6B, 13B, 15B, 17B, 6C, 6D  
88, 90, 101, 107, 115, 132 (polymerisation) + 17B, 24B, 6C, 6D

## **13. Dispersions**

97, 103, 110, 123, 124, 128 +19B, 20B, 22B

## **14. Population dynamics, Farmacokinetics, Chemotaxis**

57, 65, 72, 73, 83, 118, 181, 188

## **15. Applications to Medicine**

Tumour growth: 104, 108, 111, 112, 116, 129, 130, 134, 136, 144, 146, 147, 150, 151, 157, 159, 165, 166, 167, 174, 187, 191, 198, 213 + 21B, 23B, 25B, 28B, 30B, 39B, 45B, 46B, 48B

Tumor angiogenesis: 213 + 55B

Blood clotting: 152, 186, 192, 193, 221 + 42B, 53B

Bones growth: 169, 47B

Dialyzers: 179, 189, 202, 220 + 53B

Kidneys: 185, 218 + 53B

Pulmonary Veins Isolation (atrial fibrillation thermal treatments): 190, 198, 197, 199, 203, 206, 207, 208, 209, 215, 216, 223, 224 + 50B, 51B, 52B, 1B1, 4B1

Pulmonary Veins Isolation (atrial fibrillation treatment via PFA) 227

Blood circulation: 185, 200, 201, 205, 210, 212, 217, 218, 219, 222, 226 + 53B

Currents in biological tissues: 225

Bio-impedance: 3B1

## **16. Food Industry.**

76, 77, 80, 84, 91, 96 (coffee) + 16B

133, 138, 143 (frying) + 37B

## **17. Industrial Mathematics (general)**

29B, 31B, 3C, 4C, 5C, 6C,

## **18. Filters**

171, 172, 175, 177, 183

## **19. Marble degradation**

145 + 32B

## **20. History of Medicine**

211 + 54B

## Novels and essays.

All texts in Italian.

1. **Quando gli italiani dipingevano Parigi.** Istituto Matteucci-Edizioni d'Arte, Viareggio, 2018  
About the last part of the life of three great Italian painters in Paris (Zandomeneghi, Boldini, De Nittis)
  2. **Andreas Vesalius: l'uomo che cercava nell'uomo.** Edizioni Tassinari, Firenze, 2018  
Accompanying this great anatomist along his last travel: which were the thoughts of a man that had to give a new foundation to medicine? How did he die and why?
  3. **La crociata dell'amore.** Edizioni Tassinari, Firenze, 2019  
The story of an imaginary love between Godefroy de Bouillon and a girl whom he saved during the ferocious massacre of 70,000 people on July 15, 1099 in Jerusalem. How did Godefroy die and why?
  4. **E se poi fosse? Passeggiate nell'improbabile.** Edizioni Tassinari, Firenze, 2019.  
A tribute to doubt! About the greatest doubts of mankind, presented ironically and with a (bitter) smile.
  5. **Che ci crediate o no – Interrogando la fede.** Edizioni Tassinari, Firenze, 2020  
My own views on theology in five steps: the Soul, the Limb, the Hell, the Purgatory, the Paradise (on Dante's path).
  6. **Quando il genio incontra il dolore – Due vite dimenticate (Mario Puccini e Silvestro Lega).** Aracne Ed., Roma 2020  
Life and emotions of two very unfortunate but great painters (Silvestro Lega, a celebrated master of the Macchiaioli group, and Mario Puccini, belonging to the next generation).
  7. **Gli amori impossibili (antifavole).** Aracne Ed., Roma 2020  
A collection of strange tales in a dreamlike environment about unfortunate love stories.
  8. **Rivivendo i miti dell'eros.** Aracne Ed., Roma 2020  
These are two novels in one, with a common theme that (just apparently) is Eros, which makes an ironic background. Actually, Eros is a path through which the protagonists ask themselves about the meaning of life \*.  
8a \* C'era una volta Venere  
8b \*\* C'era Giada (Omaggio a Sherazade)
  9. **L'ispirazione.** Edizioni Tassinari, Firenze, 2020  
My personal tribute to Carla, untimely passed away. A great declaration of love.
  10. **Romanzando,** Aracne Ed., Roma 2020  
A curious Chinese box of novels that grow one in another on the background of a strange homicide.
  11. **Lontano negli occhi,** Aracne Ed., Roma 2021  
The story of an unfortunate girl who becomes a successful writer.
- A trilogy on Byzantine women.*  
Three books on extraordinary female characters who lived in Constantinople.
12. \* **Anna Comnena (1083-?) - La donna che sognava l'impero.** Edizioni Tassinari, Firenze, 2021  
The story of the writer of the *Alexiades* and of her dream to succeed her father Alexius I on the Byzantine throne.

13. **\*\* Teofano (941-?): l'ammaliente assassina sul trono di Costantinopoli**, Edizioni Tassinari, Firenze, 2021

The incredible woman who ruled over Constantinople through difficult times with a cynic approach.

14. **\*\*\* Zoe (978-1050) e Teodora (980-1056): lussuria e virtù nell'impero bizantino**, Edizioni Tassinari, Firenze, 2021

Two sisters who hated each other but had to share the throne.

15. **Ringraziando le donne**, Edizioni Tassinari, Firenze, 2021

A tribute to the women who helped the author after the loss of his love and to the feminine sensitivity in general.

16. **Il complotto eretico-erotico**, Edizioni Tassinari, Firenze, 2022

A satiric novel about conspiracy theorists in the wake of Covid-19.

17. **Berthe Morisot – Tormentata, Coraggiosa, Impressionista**. La Bussola, Roma, 2022

A novel on the life of a great painter in a time that was difficult for women to be successful in an artistic, revolutionary career.

18. **Lu e i suoi gatti: una storia dell'anno mille**. Edizioni Tassinari, Firenze, 2022

A tale from the middle ages that ultimately leads to suggesting how elusive the perception of time is.

19. **Dialoghi sul prima e sul poi**. Edizioni Tassinari, Firenze, 2022

Two optimistic dialogues concerning solitude, particularly of elderly people, and the aspiration of being remembered. Each of the dialogues takes inspiration from an aria by Henry Purcell and mimics formally Galilei's celebrated work *Dialogo sui massimi sistemi del mondo*.

*The Sunset of an Empire.*

Two books describing the fatal decline of the Byzantine Empire, starting with the advent of the emperor Andronico I and ending with the capitulation of Constantinople conquered by the Venetian doge Enrico Dandolo. The story encompasses three crusades (second, third and fourth).

20. **\* Andronico I di Costantinopoli: Lo spietato imperatore che inventò le corna**. Edizioni Tassinari, Firenze, 2022

A cruel man with an incredible charm who paved his way to the throne with terrible murders, while the second crusade was on the background.

21. **\*\* Bisanzio addio**. Edizioni Tassinari, Firenze, 2022

The tragic fall of Constantinople resulting from the diversion of the fourth crusade by the old and smart Venice doge Enrico Dandolo. All this happens after the third crusade, where great characters like Richard the Lionheart and Saladin come into play.

22. **Jean Baptiste Lully - Il fiorentino che danzò col Re Sole**. La Bussola, Roma, 2023

Born in Florence, the talented boy Giovanni Battista Lulli was taken to Paris to entertain a noble young lady. There he became Lully and made a fantastic career at the court of Louis XIV, opening new horizons to music.

23. **Lo Stilita**. Edizioni Tassinari, Firenze, 2023

In the V century Simeon the Stylite spent the last 37 years of his life on top of a high column. This novel inquires his thoughts in his last days when he discovers hurting contradictions in his lifelong faith. The character is real, his heretical ideas come instead from the author.

24. **Il diavolo, che diavoleria!** Edizioni Tassinari, Firenze, 2023

A light-hearted story of the Devil, from the "origins" up to the year four billion two thousand and twenty three...

25. **Amore dal Cosmo**. La Bussola, Roma, 2023

A mature woman falls in love with astronomy (and an astronomer), a love which will change her life and her personality. Astronomy is in the background, from the Greeks to the recent discoveries.

**26. La riserva di sogni.** Edizioni Tassinari, Firenze, 2023

Giulia Solari is a single woman, next to retirement, who works in Rome as a coroner. Her life is monotone, but one day a young apprentice, fond of the history of medicine, comes to her laboratory bringing a new atmosphere. Dreams bloom again in Giulia's head, but very soon he will involve her in a series of crimes, though in a happy world.

**27. La ragazza che giocava col tempo.** Edizioni Tassinari, Firenze, 2023

This novel is actually a tribute to Maurits Cornelis Escher, the great Dutch graphic artist. The protagonist is a woman who isolated herself because of a tremendous loss, living secretly her trauma in a dissociated time. She meets a man who can rebuild her life, but only when she will visit Escher, towards the end of the artist's life, she will understand that, like in his baffling engravings, the way of perceiving space and time can eventually find a rational solution. Then she will reach happiness. In this way the reader is invited to discover the emotional contents in Escher's seemingly abstract art.

**28. Splendori, amori, orrori nella Spagna di Goya.** La Bussola, Roma, 2023

Main events and people in Spanish history at the time of Goya seen through his art. An immense painter and a series of incredible characters.

**29. La danza delle parole.** Edizioni Tassinari, Firenze, 2024

Two overlapping stories take place, one "real" and one imaginary, which nevertheless intertwine with each other. A frustrated character, who has done secondary tasks in the film business and is about to retire, wants to fulfill his life's dream: to write a screenplay. He then creates a psychological drama that sees two very old but very brilliant people, a male architect and a female psychiatrist, dueling with witty and sharp dialogues (the dance of words). Both stories, the lived one and the written one, will have a surprise ending.

**30. Il vecchio e il libro.** La Bussola, Roma, 2024

Inspired to Hemingway's "The old man and the sea", this is the story of an old disillusioned writer who daily fights with what he thinks could be his masterpiece. He parallels his fight with the one of Hemingway's old unlucky fisher and his marlin. However, the core of the story is the confrontation between two deadly enemies, in which that book will physically play a key role, while its writer is nothing but a dummy pawn.

**31. Il tempo della follia.** La Bussola, Roma, 2024

A girl working for a local newspaper conducts a series of interviews with an old scientist hospitalized in a psychiatric facility. The old man is suffering from a compulsive mania for writing and a legend is being born around his mysterious writings. Are they important? The old man is extremely clever and fascinating; is he really crazy? A rather shady story unraveled by the smart journalist will reveal it.

**32. Lontano dall'Eden.** Edizioni Tassinari, Firenze, 2024

Adam and Eve have been just expelled from Eden. They are confused and faced with the new concept of death. They try to understand what happened and to figure out their future. Their doubts and fears open an endless series of questions. Then we will see Cain's crime and the terrible punishments that God sent to the human kind, namely the Great Flood and the confusion of languages at the Tower of Babel. In front of the great myths of the *Genesis*, we will follow a hopeless path in search of explanations, but also letting us be fascinated by poetry, with the help of Dante and of his *Commedia*.

**33. Gli astri intelligenti.** Edizioni Tassinari, Firenze, 2024

Astrology, astronomy, artificial intelligence interact in a light-hearted way in the frame of a modern-day fairy tale. But be careful: the focus is on the future awaiting us.

**34. Cosimo III de' Medici. Il Granduca che inventò il D.O.C.** La Bussola, Roma, 2024

The penultimate Grand Duke of Tuscany of the Medici dynasty was quite a debatable character, very pious and conservative, whose reign was characterized by a sharp economic and political decline. However, he is remembered for his law protecting the wine producing Tuscan areas, in a time when wine trade was affected by fraud with label forgery.

This novel is about his life, the dependence on his strong mother, the dramatic quarrels with his wife, a cousin of Louis XIV. The rich artistic life of that time and the complex historical background of his reign are of course important narrative ingredients. Cosimo's successor, his son Gian Gastone, will embody the ruinous end of the Medici family.

### **35. Il Pozzo di Thor (La Bussola, Roma, 2024)**

A small-town elementary school teacher, a lonely and insignificant man, is accused of kidnapping and abusing a girl from his school. Since the evidence is clear and concrete, the man is arrested under suspicion of having acted in honor of Thor, a Norse deity. However, his psychological profile seems incompatible with such a horrendous crime. The public defender, an intelligent woman but with too many failures in her personal life, will undertake the seemingly impossible task of shedding light on that case. The only clue she has is a just published book showing on the cover the Thor's well, a horrendous hole communicating with the ocean on the coast of Oregon State. She will find the collaboration of the local police commander, a woman who used to be a friend when they both were young.

### **36. La pillola del tempo (Edizioni Tassinari, Firenze, 2024)**

The pill of time is a drug, a terrible secret between an elderly sculptor and philosopher and his beloved niece Daria, a young and brilliant doctor. The old man lives alone in the city of Lucca, cultivating the memory of his beautiful wife, who died prematurely many years before. Everyone knows that he works a lot, but no one has ever seen any of his sculptures. The intense intellectual exchange between these two characters will gradually bring out the tragic story behind his behavior. The sculptor's daughter and mother of Daria, a famous pianist, also intervenes in the story, together with Daria's little daughter, a girl with precocious musical talent, whose career will be favored by the fame acquired through the amazing adventures of her family.

### **37. 3001, Odissea nello strazio: come finirà l'intelligenza artificiale? (La Bussola, Roma, 2025)**

We find ourselves in the year 3001, in the middle of the perfect society dreamed of by ancient philosophers, finally realized by artificial intelligence. No more wars, no more suffering, no more inequality. But at what price? To eliminate conflicts, all competitions must be eliminated and with them aspirations, as well as passions, the anxiety of possession and above all confessional differences. Therefore, a society that is blissful but not happy, safe but emotionless, forgetful of ancient evils but also of art and no longer creative. Fortunately, all documented culture is available in the huge memory of the great electronic administrator, even if no one cares about it anymore. With one exception: a man whose chromosomes contain a passionate reverberation and who assiduously digs into that immense archive in search of great emotions. He will meet a woman in whom he will recognize his own "genetic defect" and together they will present the governing machine with a proposal for the revival of the ancient culture in the form of a short text. The latter prefigures the evolution of a new humanity, parodying the Genesis. The clash with the large electronic system is inevitable. How will it end? Will a new world arise from that rebellion?

### **38. Tre passi nell'Eros (La Bussola, Roma, 2025)**

This series collects three novels, three stories set respectively in the 19th, 20th and 21st centuries, characterized by very strong female characters. Against the backdrop of often cruel events, the presence of a sometimes hilarious erotic streak, always aimed - with abundant irony - at redeeming an ethical content in Eros in the face of the marginalization it has received in common morality. The various heroines of the three stories have in common the singular olfactory ability (real or presumed) to perceive people's moral qualities through scents that they alone can perceive. Despite the many tragic passages of these stories, optimism reigns and, as befits, they see the victory of the "good guys".

### **38a. \* Storie dal lago**

In the year 1868 the Maggiore lake in northern Italy raised its level by seven meters, causing great disasters. The story told here begins with that catastrophic event and develops over several years. The main characters are two women who had an unfortunate childhood, but with great courage managed to reach important goals. Their life is characterized by many tragic episodes, but the story also has an ironic erotic background.

### **38b. \*\* I colori di Azzurra**

Azzurra Pacini is a very unfortunate young girl, but endowed with extraordinary strength of mind and unshakable optimism. After losing her mother, from whom she inherited an acute sensitivity for colors, she will also have to face his father's serious illness, but from these misfortunes she draws the strength to discover the wonders of the world, relying on two strange characters who live in her great tenement on the outskirts of Rome. The story, set in the mid-

1950s, ends up intertwining with a sensational crime story and will see Azzurra become famous thanks to her intelligence and profound intellectual honesty.

### 38c. \*\*\* **Accadde a una donna per bene**

Allegra Benvenuti, a woman in her fifties, a little overweight, employed at a travel agency, has always neglected herself and her career to dedicate herself to her family: her beloved sixteen-year-old daughter, beautiful and intelligent, and her insignificant husband, pathologically conditioned by his habits. To keep her job she is forced to go to Tel Aviv to arrange business with a luxury hotel. Before boarding the plane she finds a fascinating man, Tony Bellandi, a mysterious character. Following him, she will find herself involved in a series of amazing and risky undertakings that will change her life forever.

### 39. **Anni Santi... e Papi meno** (Edizioni Tassinari, Firenze, 2025)

A review of the Jubilees from the Middle Ages to 1650, focused in particular on the popes that indicted them with the help of chronicles and art. A surprisingly amazing story!

### 40. **Papa Ultimo Primo** (La Bussola, Roma, 2025)

In the year 2049 (just before the 2050 Jubilee) a new Pope is elected. He is a little Eskimo cardinal who chooses the name "Ultimo I". While innumerable conjectures are formulated around the world, the new pope "speaks" through a fleet of drones creating fantastic shows and communicating revolutionary changes in the Church. To what end? Why do the conservative cardinals remain silent? The whole story is followed by a merry couple at home, who occasionally consult a TV network illustrating the lives of popes (*Popeflix*), so to relate those events to the history of the Catholic Church. It will be discovered that the roots of this strange revolution go back to the origin of Christianity. The new pope will manage to create a new Vatican State incorporating Greenland with the aim of starting a unification process with the protestant. He possesses an old document which could undermine the whole Christianity, which he uses to keep the cardinals in check. Will his dream come true amidst the huge tensions he created?

## **MORE**

I collaborated in writing the biography

### **Quadri di vita di un mercante d'arte** (Allemandi, Torino, 2025)

The exciting biography of an art dealer (Giuliano Matteucci) who unfortunately died soon after the book was completed.

**In press**

### **Museo dell'Ottocento – Collezione Di Persio-Pallotta, Pescara**

Guide to the Museum.