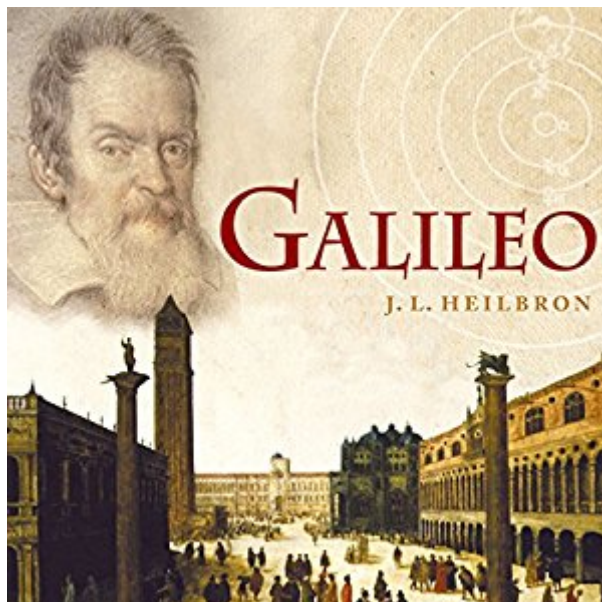


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# Galileo



## Synopsis

In 1610, Galileo published the *Siderius nuncius*, or *Starry Messenger*, a "hurried little masterpiece" in John Heilbron's words. Presenting to the world his remarkable observations using the recently invented telescope - the craters of the moon, the satellites of Jupiter - Galileo dramatically challenged our idea of the perfection of the heavens and the centrality of the Earth in the universe. Indeed, the appearance of the little book is regarded as one of the great moments in the history of science. Planned to coincide with the 400th anniversary of the publication of the *Starry Messenger*, this is a major new biography of Galileo, a fresh and much more rounded view of the great scientist than found in earlier works. Unlike previous biographers, Heilbron shows us that Galileo was far more than a mathematician: he was deeply knowledgeable in the arts, an expert on the epic poet Ariosto, and a fine lutenist. More important, Heilbron notes that years of reading the poets and experimenting with literary forms were not mere sidebars - they enabled Galileo to write clearly and plausibly about the most implausible things. Indeed, Galileo changed the world not simply because he revolutionized astronomy, but because he conveyed his discoveries so clearly and crisply that they could not be avoided or denied. If ever a discoverer was perfectly prepared to make and exploit his discovery, it was the dexterous humanist Galileo aiming his first telescope at the sky. In Galileo, John Heilbron captures not only the great scientist, but also the creative, artistic younger man who would ultimately become the champion of Copernicus, the *bête noire* of the Jesuits, and the best-known of all martyrs to academic freedom. The title music in this audiobook is *Ave Maris Stella* by Claudio Monteverdi, which was published in the same year Galileo published *Sidereus Nuncius* (i.e. *The Starry Messenger*). *Ave Maris Stella* was performed using period instruments by the Green Mountain Project. We're especially proud to note that a member of the Green Mountain Project, Hank Heijink, also works at Audible!

## Book Information

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## Customer Reviews

I read primarily historical biography. I enjoy seeing historical/political context to a subject and how that subject related to that environment. I liked this book, but found so much of the scientific detailed explanations excessive for my interests as a general reader. I thoroughly enjoyed reading of the conclusions made by clergy and others who hung onto tradition. I liked understanding Galileo's personality. But I really wanted to see more of the geo-politics of that period, the transitions into Renaissance, etc. I am glad I read this book. It was enlightening. But it was a chore. Galileo

This is a well researched and long review (366 pages) of Galileo's life and accomplishments. The book requires the reader to be well grounded in history as well as science to appreciate the detail discussed. Not for the faint of heart. The New York Times Book Review calls it "An awesome command of the vast Galileo literature".

An erudite, witty tour of the times, life, and meaning of Galileo. Heilbron brings a career's worth of knowledge and insight to the task, and we get a richly evoked picture of a pivotal time in the early modern era. Readers unfamiliar with the science may find themselves skipping diagrams and explication, but they will not be missing the author's fundamental points. It's not a beginner's introduction to history, but anyone appreciative of serious research and good writing will enjoy this book.

i was shocked at some of the careless typos in the book. here are two egregious examples...1. "from the conception of virginia in 1599 to that of vincenzo in 1506"...clearly they mean 1606. the third child couldn't have been before the first by 93 years!2. "virginia, born 1600, now famous as 'galileo's daughter'; livia, born 1601; and vincenzo, born 1606."...i know the difference between conception (see number 1 above) and birth, but please be consistent. this type of writing irks me, trying to be too clever and then tripping over your untied shoes. these two typos occurred over pages 84 and 89. shouldn't the expert publishers at oxford university press have caught this? there were a couple of others which i am too lazy to go flipping back to point out. after catching these two i

had to stop and point them out.

I read mostly non-fiction and history and biographies are two of my favorite topics. I have read many books about Galileo, Newton, Einstein, various American presidents, and many other famous people. What I love about these books is what I learn about each of the people and am amazed how each new biography manages to uncover previously unpublished facts or perspectives. They are informative. This book was a disappointment. The author seems most interested in proving his intellectual prowess with digressions into irrelevant material and frankly uninteresting material. The tone is pedantic - not instructive. I put the book down after less than 100 pages.

To write a biography is to take the measure of a man's life, but what is the proper yardstick for a man of Galileo's stature? John Heilbron's biography of the man, Galileo, shows that several yardsticks are needed, and of various metrics. There was, naturally, Galileo the philosopher, what we would today call a scientist. And, of course, Galileo the mathematician. Certainly, Galileo the inventor. But there was Galileo the theologian, too. Also, Galileo the musician. And Galileo the literary critic. As well as Galileo the author of literature. Even Galileo the literary character. Not to mention Galileo the bon vivant! But which one was the real Galileo? Heilbron doesn't explicitly raise this particular question, but he nevertheless answers it in the rich detail provided on Galileo's life. Each of these was the real Galileo. Or rather, each was a shade to Galileo's character, and Heilbron uses all of these shades to color his lively portrait of the man. Galileo inherited some of his character from his father, Vincenzo, a musician and music theorist who took issue with the Ptolemaic music theory defended and propagated by his music teacher, Gioseffo Zarlino. Heilbron offers the significant observation that "Vincenzo Galilei was a theorist of integrity" who "did not just reject authority but showed by 'sensory experience and necessary demonstration,' as Galileo would say, just where the authority went astray" (page 9). By his father, then, Galileo was raised to question authorities such as Ptolemy, but in a rigorous manner, by the use of empiricism and logic. Not that Galileo was rigorous to a fault. He was an accomplished gambler who "occasionally bluffed by raising the stakes on a losing hand" and whose "later claims about experimental results and theoretical insights contained a quantity of bluff" (page 24). As Heilbron notes, this raises a question: "Did experiment drive theory or theory experiment?" The answer: "Sometimes the one and sometimes the other, but also, and not rarely, neither. Galileo could stick to an attractive theory in the face of overwhelming experimental refutation. During his period of greatest creativity in the science of motion, from 1602 to 1609, he probably jumped from theory to experiment and from one

idea to another, circled back and forth, inventing the form of descriptive mathematical physics, guided by little more than his *buon gusto*. The principal outcome was a somber, limited, exact science, and a few striking results, advertised as more exact than they were, to serve as a replacement for one chapter of the vast, colorful, diffuse library of Aristotelian philosophy." (pages 126-127) The most fascinating point that Heilbron makes is that Galileo was guided by the aesthetic principle of *buon gusto*, that is, good taste! Was Galileo more artist than scientist? In a sense, yes, and often self-consciously so. By the time that he wrote his works *The Assayer* (1623) and *Dialogue on the Two Chief World Systems* (1632), he appears to have been more interested in making a splashy literary impact than in writing science. Heilbron explains the 'nonscientific' character of these two 'literary' works by Galileo: "[W]hat shall we make of the extravagance of the Pisan Drop, the creation point of the planets, said to answer perfectly to calculations? Or of the bizzarria (oddity), to which we will return, that a freely falling body does not accelerate but only changes its direction of motion? Salviati [i.e., Galileo] takes the trouble to demonstrate this bizzarria and Sagredo accepts it as a marvel. Modern readers also wonder at it. Was Galileo, the master of experiment, the facile geometer, the slayer of Aristotle, dishonest, as Arthur Koestler would have him, or just a charlatan, as Paul Feyerabend preferred? Neither. Galileo as stage manager is the creator of ingenious fancies, mathematical caprices, an epic poem, a set of stories. Sagredo asks Salviati to describe the curve of a freely falling body in space; the masked Galileo [i.e., Salviati] replies with the clever nonsensical bizzarria; nature too is part of the masquerade. Galileo's comedic talent reached full strength in the barbs, jokes, word plays, paradoxes, irony, satire, and gross caricature of the *Assayer*. As if to signal its epistemological level, Galileo inserted more quotations from Ariosto than he did in any other of his books." (pages 230-231) Heilbron's point is that Galileo wasn't writing science as we understand it today. He was marshalling the power of rhetorical techniques and poetical figures, along with accepted literary convention, to overwhelm his opponents, all of which helps explain the 'martyr' of early modern science who many times seems not very scientific to us now. Indeed, Galileo often hardly even seems particularly reasonable. One surprising problem with Galileo as a person was, ironically, his limited horizon, for as Heilbron remarks in a chapter titled "Miscalculated Risks": "We are reminded again [by Galileo's social connections] how provincial or peninsular Galileo's purview was: his subject may have been the universe, but his audience was a few dozen highy-placed literate Italians whose good opinion he prized." (page 245) Regardless what others might think, these "literate Italians" would appreciate him as a literate man, even as a literary figure, who knows how to turn a phrase -- or better, a quote from his favorite poem -- against a 'dishonorable' challenger like Lotario Sarsi Sigenzano, the pen name of Orazio Grassi, a Jesuit

astronomer and mathematician who (legitimately, in fact) disputed some of Galileo's views, for example, on the nature of comets, Galileo not being the sort of man to share celestial glory with others who dared to explore his heavens:"Quoting a line from Ariosto, Galileo intimated that he was condescending to argue over truths he already possessed. Noblesse oblige. The line referred to a fight between Orlando and Mandricardo over Orlando's sword. 'Mine [though] it is by right, let us stage a chivalrous duel for it.'" (page 245)What is significant in this is Galileo's manner of casting himself as a medieval knight in a romance, specifically Charlemagne's knight Orlando (also known as Roland), for at issue are not so much points of truth as points of honor. Intellectual opponents are not merely incorrect, they are unworthy!In a further joust with Sarsi (Grassi), therefore, Galileo constructs a literary scene in which he overwhelms this 'unworthy' opponent and scornfully advises him, "Therefore yield, and be silent," concerning which Heilbron dryly observes, "That is the way a knight does science." The real life Grassi does not fall silent, but publishes a rejoinder, a challenge to which Galileo replies . . . not at all. Why not? Because Galileo's friends, some of those "literate Italians" who mattered, "judged that he had saved their honor and his" own (page 252).The chapter that follows this one in Heilbron's biography of Galileo is titled "Vainglory." Galileo, as the proud knight Orlando, sensitive to slights, loses all perspective, falls victim to his overweening pride, and meets with a tragic conclusion in a mad, furious fight with the Church that he cannot win and could have avoided. But avoidance would have come at a price. While Pope Urban VIII had allowed for Galileo to advocate the use of Copernican theory as a device for calculating the apparent motions of the heavens, the theory could not be defended as literally, physically true. Actually, the Pope went a bit further than that, insisting that God, in His omnipotence and infinite wisdom, may in fact have used any of a potentially infinite possible structures for the cosmic mechanism hidden behind the facade that we empirically perceive with our eyes. This was the Pope's position, a variant on theological voluntarism (i.e., God's free will), which has a rather long history in Christianity. Galileo seems not to have liked the argument, but he put the Pope's position into the mouth of one of the three characters in his Dialogue, the character named Simplicio, the simpleton who supports the traditional, earth-centered cosmos that was a synthesis of Plato and Aristotle (even though the Pope's view is not, strictly considered, even Simplicio's position). But why didn't Galileo bend his knee on this point and express as his own the Pope's view on theological voluntarism? Heilbron suggests:"Had Galileo written such words, philosophers, mathematicians, and astrologers whose theories implicitly limited God's past and future actions would find themselves opposed to the greatest mathematician in Italy, and perhaps the world. But Galileo could not speak Urban's words. That would have amounted to a denial of his mission." (page 304)What was this mission? To defend

the truth of Copernicanism! For Galileo, Copernicanism was the physically correct system to hold, for both rational and empirical reasons. Galileo was, implicitly anyway, opposed to theological voluntarism. But why opposed? Did he consider as theologically unworthy the belief that God would offer a cosmic facade misleading scientists to the false conviction that one cosmic system is preferable to another, that one cosmic system is physically true even though it isn't true at all? Some things remain unclear about Galileo's views, but his lack of clarity was the sort of thing that raised Church suspicions and brought Galileo to be "vehemently suspected of heresy, namely of having held and believed a doctrine that is false and contrary to the divine and Holy Scripture" (page 317). Under that severe pressure, Galileo recanted. Heilbron offers a sympathetic perspective on Galileo in his moment before the Inquisition, but he never overlooks Galileo's flaws and limitations, and he treats the great man's career with wit and irony, precisely the sort of approach that a man like Galileo would understand. But Heilbron also judges with appreciation in that irony as he considers whether or not Galileo is headed for sainthood, an inquiry based on the Catholic Church's revaluation of Galileo's 'reform' of scriptural hermeneutics in a way that placed his belief "that human beings can reach truth by the light of reason" above Pope Urban VIII's denial "that humans can recognize truth unaided by revelation" (page 364), as well as on the reverential treatment of Galileo's bones as 'relics' by various devotees of that man: "It might be objected that Galileo performed no miracles. What then were the miracles of Thomas Aquinas? In fact, Galileo performed a stupendous miracle. He obliterated the ancient distinction between the celestial and terrestrial realms, raised the earth to the heavens, made the planets so many earths, and revealed that our moon is not unique in the universe. Not since creation had there been such a refashioning. Then there was the miracle of himself, a rare combination of talents and personalities, who, despite mania and depression, arthritis, gout, hernias, blindness, and overindulgence in wine and wit, lived to write three books -- the Messenger, the Dialogue, and the Discourse -- any one of which would have given him enduring fame. According to Galileo's mechanics, the slightest force can move the greatest weight given sufficient time. The direction of motion is clear. Who can doubt that within another 400 years the church will recognize Galileo's divine gifts, atone for his sufferings, ignore his arrogance, and make him a saint?" (page 365) Take these remarks with a hefty grain of salt, given the irony, but there's a pinch of sincerity revealed in these final words by Heilbron, properly interpreted with the aid of reason. Note, by the way, that this biography, published in the 400th anniversary year of the publication of the Starry Messenger, ends its story, appropriately enough for a book dedicated to a man concerned with the motions of the earth, on a page signifying both diurnal and annual motions, namely, page 365. I heartily recommend this biography by Heilbron to

anyone interested in the man Galileo. Some of the mathematics went above my head despite my background in the history of science, but the formulas and reasoning are part of Galileo's life, and Heilbron explains them with admirable clarity. Moreover, one need not understand all the technical details to appreciate Galileo's achievements, for the context provides sufficient information to offer readers an understanding of Galileo the philosopher (scientist), the mathematician, the inventor, the theologian, the musician, the literary critic, the author of literature, the literary character, and the bon vivant. In short, an excellent, informative, entertaining book.

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