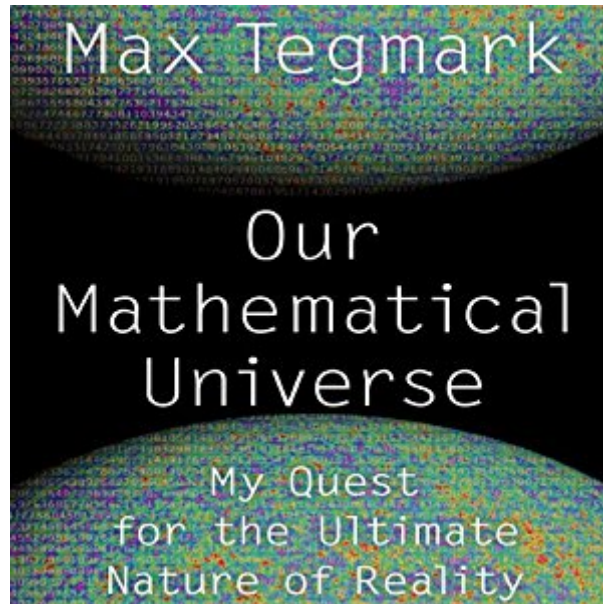


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# Our Mathematical Universe: My Quest For The Ultimate Nature Of Reality



## Synopsis

Max Tegmark leads us on an astonishing journey through past, present and future, and through the physics, astronomy, and mathematics that are the foundation of his work, most particularly his hypothesis that our physical reality is a mathematical structure and his theory of the ultimate multiverse. In a dazzling combination of both popular and groundbreaking science, he not only helps us grasp his often mind-boggling theories, but he also shares with us some of the often surprising triumphs and disappointments that have shaped his life as a scientist. Fascinating from first to last - this is a book that has already prompted the attention and admiration of some of the most prominent scientists and mathematicians.

## Book Information

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## Customer Reviews

Books that discuss the nature of reality have become a cottage industry lately. Brian Greene, Stephen Hawking, Roger Penrose and now Max Tegmark have all attempted to explain the physicist's view of the ultimate nature of reality to a popular audience. Penrose's book, with its advanced mathematics, is geared towards those with a technical background but the trend has been to simplify the science and make these books anecdotal and gentle. Tegmark seems to have discovered the sweet spot between hard core science and a fun read, using the word "geeky" as a red flag any time a technical detail is about to be broached. His language is reader friendly and easy to understand. Tegmark is a good writer and anyone that has seen him on television (Through the Wormhole, for example) knows that he is funny and well-grounded in popular culture. Our Mathematical Universe is a nearly perfect example of a popularized science book. Years of reading

science books have produced a personal pantheon of the finest I've ever come across. There are several aspects of Tegmark's book that have placed it amongst the three finest popular science books I've ever read. The other two books are Albert Einstein and Leopold Infeld's *The Evolution of Physics* and Kip Thorne's *Black Holes and Time Warps: Einstein's Outrageous Legacy* (Commonwealth Fund Book Program). The first book, *The Evolution of Physics*, is still the clearest exposition of classical and (relatively) modern physics ever written, despite its age. It remains the most authoritative, concise and profound discussion of the source of Einstein's world-shattering ideas, and has never been surpassed as a book written by a great scientist for a popular audience. Kip Thorne's book combines personal reminiscence and scientific exposition with an elegance and depth that makes it my choice as the finest modern popularized science book. Thorne proved that you can write about science in an engaging manner without sacrificing either intelligence or necessary relevant technical detail. The attributes that raise Tegmark's book amongst the very finest in the genre are its engaging writing style, its willingness to discuss technical details about recent trends in cosmology without sacrificing either intelligence or clarity, and its almost subversive depth. Tegmark has a flair for discussing some really knotty topics like the significance of the cosmic microwave background, Einstein's theory of gravitation, the geometry of curved space, mathematically precise cosmology, dark matter and dark energy without losing the reader in a labyrinth of confusing and difficult scientific details. Tegmark teaches without ever being pedantic and he entertains while he clarifies and enlightens. There aren't many science writers who can write about such abstract and craggy subjects as cosmology, multiple multiverse levels, and mathematics as the ultimate nature of physical reality with Tegmark's wit and ease. If you are a fan of reading popularized science books, *Our Mathematical Universe* is one of the finest I've ever read and definitely worth your consideration.

Despite its name, "*Our Mathematical Universe*" is not a math book. It is an exploration of the nature of our physical reality according to the author's own Mathematical Universe Hypothesis (MUH). However, the MUH has been noted by math fans. For instance, it is the last subject covered in *The Math Book* by Clifford Pickover. At the end of the first chapter, Tegmark suggests that if you are a physicist you can skip ahead. I do not recommend this. Tegmark tells his story in a lively manner punctuated by illustrations and personal anecdotes. It is all a good read. Along the way, we learn that the author has conducted a survey of physicists, repeated over time, about the quantum wave function. Early on, sentiment favors the Copenhagen interpretation. Later, Many Worlds is favored. I fall into that latter group. Tegmark proposes a life-or-death quantum machine-gun test of Many

Worlds. I do not think that his test is necessary. The improbable victory of the Mets in game six of the 1986 World Series is sufficient proof for me. Tegmark says that it is not enough to say that mathematics describes physical reality, but that our physical reality is mathematics. Our conservation laws are expressions of symmetries of the mathematical object that is our (multi)universe. Also, time is just another coordinate in space-time. Its passage is an illusion. I have read that Tegmark sends e-mails to his future selves. Like many physicists, I believe that the Second Law is perhaps our most important concept. I think that Tegmark should have said more about how the MUH treats entropy. Finally, Tegmark presents a way to test the MUH. If the universe is not a mathematical object, then physics will reach a dead end in which we can no longer describe reality by mathematics. If the MUH is correct, then we will continue to find mathematical descriptions. Tegmark is an excellent storyteller. This work is well worth reading and thinking about.

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