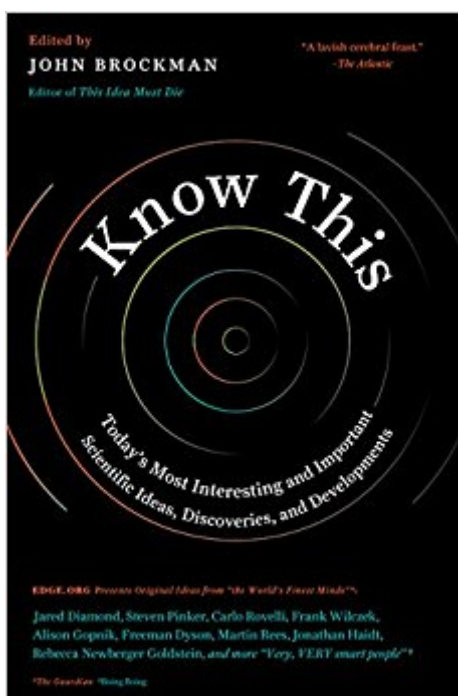


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Know This: Today's Most Interesting And Important Scientific Ideas, Discoveries, And Developments



Synopsis

Today's most visionary thinkers reveal the cutting-edge scientific ideas and breakthroughs you must understand. Scientific developments radically change and enlighten our understanding of the world -- whether it's advances in technology and medical research or the latest revelations of neuroscience, psychology, physics, economics, anthropology, climatology, or genetics. And yet amid the flood of information today, it's often difficult to recognize the truly revolutionary ideas that will have lasting impact. In the spirit of identifying the most significant new theories and discoveries, John Brockman, publisher of Edge.org ("The world's smartest website" -- The Guardian), asked 198 of the finest minds What do you consider the most interesting recent scientific news? What makes it important? Pulitzer Prize-winning author of *Guns, Germs, and Steel* Jared Diamond on the best way to understand complex problems * author of *Seven Brief Lessons on Physics* Carlo Rovelli on the mystery of black holes * Harvard psychologist Steven Pinker on the quantification of human progress * TED Talks curator Chris J. Anderson on the growth of the global brain * Harvard cosmologist Lisa Randall on the true measure of breakthrough discoveries * Nobel Prize-winning physicist Frank Wilczek on why the twenty-first century will be shaped by our mastery of the laws of matter * philosopher Rebecca Newberger Goldstein on the underestimation of female genius * music legend Peter Gabriel on tearing down the barriers between imagination and reality * Princeton physicist Freeman Dyson on the surprising ability of small (and cheap) upstarts to compete with billion-dollar projects. Plus Nobel laureate John C. Mather, Sun Microsystems cofounder Bill Joy, Wired founding editor Kevin Kelly, psychologist Alison Gopnik, Genome author Matt Ridley, Harvard geneticist George Church, *Why Does the World Exist?* author Jim Holt, anthropologist Helen Fisher, and more.

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Customer Reviews

“Addictive, fascinating, exciting--even on topics I already knew quite a lot about. Very high quality.” (Daniel C. Dennett, bestselling author of *Breaking the Spell*; University Professor and Austin B. Fletcher Professor of Philosophy and Co-Director of the Center for Cognitive Studies at Tufts University) “Delightful. ... Lucid intellectual hors d'oeuvres that deserve rereading.” (Kirkus Reviews) “Brockman's array of contributors and subject matter makes for an often lively collection.” (Publishers Weekly)

Today's most visionary thinkers reveal the cutting-edge scientific ideas and breakthroughs you must understand. Scientific developments radically change and enlighten our understanding of the world—whether it's advances in technology and medical research or the latest revelations of neuroscience, psychology, physics, economics, anthropology, climatology, or genetics. And yet amid the flood of information today, it's often difficult to recognize the truly revolutionary new ideas that will have lasting impact. In the spirit of identifying the most significant new theories and discoveries, John Brockman, publisher of *Edge.org* (“The world's smartest website” —*The Guardian*), asked 198 of the finest minds: What do you consider the most interesting recent scientific news? And what makes it important? Pulitzer Prize-winning author of *Guns, Germs, and Steel* JARED DIAMOND on the best way to understand complex problems • author of *Seven Brief Lessons on Physics* CARLO ROVELLI on the mystery of black holes • Harvard psychologist STEVEN PINKER on the quantification of human progress • TED Talks curator CHRIS J. ANDERSON on the growth of the global brain • Harvard cosmologist LISA RANDALL on the true measure of breakthrough discoveries • Nobel Prize-winning physicist FRANK WILCZEK on why the twenty-first century will be shaped by our mastery of the laws of matter • philosopher REBECCA NEWBERGER GOLDSTEIN on the underestimation of female genius • music legend PETER DINKELBAUM on tearing down the barriers between imagination and reality • Princeton physicist FREEMAN DYSON on the surprising ability of small (and cheap) startups to compete with billion-dollar projects. Plus Nobel laureate JOHN C. MATHER, Sun Microsystems cofounder BILL JOY, *Wired* founding editor KEVIN KELLY, psychologist ALISON GOPNIK, *Genome* author MATT RIDLEY, Harvard geneticist GEORGE CHURCH, *Why Does the World Exist?* author JIM HOLT, anthropologist HELEN FISHER, and more.

Know This: Today's Most Interesting and Important Scientific Ideas, Discoveries, and Developments (Edge Question) by John Brockman is a thought-provoking book of essays brought to you by The Edge that provides readers with better tools to think about the world. The Edge is an organization that presents original ideas by today's leading thinkers from a wide spectrum of scientific fields. The 2017 Edge question is, "What do you consider the most interesting recent (scientific) news? What makes it important?" This interesting thorough 608-page book includes 198 essays from the brightest minds. For my sake, I created a spreadsheet of all the essays and graded them from zero to five stars based on quality. Five star essays are those that provide a great description of the author's favorite scientific concept. On the other hand, those receiving a one or even a zero represent essays that were not worthy of this book. Of course, this is just one reviewer's personal opinion. I basically reprised the same formula I used to review, "This Explains Everything" and "This Will Make You Smarter".

Positives:

1. This series by "The Edge" always deliver a high-quality product.
2. A great topic, "What do you consider the most interesting recent (scientific) news? What makes it important?"
3. A great range of scientific essays provided by subject matter experts.
4. There were a number of outstanding essays deserving of five stars for me. I will list my favorites as positives in this review. In order of appearance, the first by Steven Pinker, "Human Progress Quantified". Makes the compelling case that the world is actually getting better.
5. Richard Muller's "Human intuition is a notoriously poor guide to reality".
6. "The Greatest Environmental Disaster". Someday global warming may become the primary threat. But it is air pollution that is killing people now. Air pollution is the greatest environmental disaster in the world today.
7. Donald D. Hoffman's "The Abdication of Spacetime". Nathan Seiberg, of the Institute for Advanced Study at Princeton, said, "I am almost certain that space and time are illusions. These are primitive notions that will be replaced by something more sophisticated."
8. Seth Lloyd's "One Hundred Years of Failure". Encouragingly, the advances in quantum gravity supplied by quantum-information theory do not yet seem to be counterbalanced by backsliding elsewhere.
9. Brian G. Keating's "Looking Where the Light Isn't". Excellent essay. "The next century of general relativity promises to be as exciting as the first. Spacetime tells matter how to move; matter tells spacetime how to curve," said John Archibald Wheeler. We've seen what the curvature is. Now we just need to find out what the matter. And where better to look for lost matter than where the

dark is. 9. Neil Turok's Simplicity. Such a theory won't be concerned with kilograms, meters, or seconds, only with information and its relations. It will be a unified theory not only of all the forces and particles but also of the universe as a whole.

10. Steve Giddings' New Probes of Einstein's Curved Spacetime and Beyond? The community has been abuzz about the possible discovery of a new particle at the LHC, seen by its disintegration into pairs of photons. If this is real and not just a fluctuation, there's a slim chance it is a graviton in extra dimensions, which, if true, could well be the discovery of the century.

11. Rudy Rucker's The Universe Is Infinite. Many cosmologists now think our spatial universe is infinite.

12. Gregory Benford's Pluto Now, Then on to 550 AU. New Horizons is important not just for completing our first look at every major world in the solar system. It points outward, to a great theater in the sky, where the worlds of the galaxy itself are on display.

13. Scott Aaronson's How Widely Should We Draw The Circle? By letting us simulate quantum physics and chemistry, quantum computers might spark a renaissance in materials science, and allow (for example) the design of higher-efficiency solar panels.

14. John Tooby's The Race Between Genetic Meltdown and Germline Engineering. Natural selection is the only physical process that pushes species' designs uphill against entropy, toward greater order (positive selection) or maintains our favorable genes against the downward pull exerted by mutation pressure (purifying selection).

15. Eric Topol's The 6 Billion Letters of Our Genome. So the biggest breakthrough in genomics' Science's 2015 Breakthrough of the Year is the ability to edit a genome, via so-called CRISPR technology, with remarkable precision and efficiency.

16. Juan Enriquez's Life Diverging. Thus the biggest story of the next few centuries will be how we begin to redesign life-forms, spread new ones, develop approaches and knowledge to further push the boundaries of what lives where.

17. Thalia Wheatley's Biology Versus Choice. The emergence of perhaps the greatest developing news story: the widespread understanding that human thought and behavior are the products of biological processes.

18. Gino Segre's Diversity in Science. Science has become increasingly collaborative in a way that makes diversity a paramount necessity.

19. David G. Myers's We Fear the Wrong Things. The hijacking of our rationality by fears of terrorist guns highlights an important and enduring piece of scientific news: We often fear the wrong things.

20. Oliver Scott

Curry's "Morality Is Made of Meat". "Morality is natural, not supernatural. We are good because we want to be, and because we are sensitive to the opinions—the praise and the punishment—of others. We can work out for ourselves how best to promote the common good, and with the help of science make the world a better place."—21. Christian Keysers' "Optogenetics". "For the first time, we can selectively re-create arbitrary states in the brain—and hence the mind."

Negatives:

1. At over 600 pages, it will require an investment of your time.
2. Some essays were not worthy of this book. That said, the series has improved and there were very few lemons.
3. Lacks visual material to complement the excellent narrative.

In summary, I'm a big fan of *The Edge*. I enjoy essays from great minds covering a wide variety of topics and this one doesn't disappoint. This has close to 200 essays and it never fails to be provocative and inspirational. The search for knowledge is a fun and satisfying pursuit. Pick up this book and enjoy the ride.

Further recommendations: "This Explains Everything: Deep, Beautiful, and Elegant Theories of How the World Works" and "This Will Make You Smarter" by John Brockman, "A Universe from Nothing: Why There Is Something Rather than Nothing" by Lawrence Krauss, "The Greatest Show on Earth: The Evidence for Evolution" by Richard Dawkins, "The Disappearing Spoon: And Other True Tales of Madness, Love, and the History of the World from the Periodic Table of the Elements" by Sam Kean, "The Tell-Tale Brain: A Neuroscientist's Quest for What Makes Us Human" by V.S. Ramachandran, "The Believing Brain: From Ghosts and Gods to Politics and Conspiracies" by Michael Shermer, "How to Create a Mind: The Secret of Human Thought Revealed" by Ray Kurzweil, "The Blank Slate: The Modern Denial of Human Nature" by Steven Pinker, "Guns, Germs, and Steel: The Fates of Human Societies" by Jared Diamond, "Why Evolution Is True" by Jerry A. Coyne, and "Subliminal: How Your Unconscious Mind Rules Your Behavior" by Leonard Mlodinow.

All OK.

Though of short essays, the range of topics is broad in scope and, mostly, surprisingly interesting.

The authors produce a complete exposition about the great questions of the science. If the physics is interesting about cosmology, the biology had had big successes with the applications of results of DNA. The informatics is construing algorithms always more efficient, so we can be satisfied of this situation. Also the war against the cancer is won more often. This technology looks like winning, but

the difficulties are always present, because that is a characteristic of a science which want become better.

Brings one up to date very many important topics and leads to further inquiry. Outstanding "thinkers" who cover their ground with brevity and cogency.

Brilliant!

A collection of very short essays - enough, in some cases, to whet your appetite - but not much depth or substance. Might be good as an introduction for people who do not follow science at all.

In *Know This*, editor Brockman of the Edge.org presents nearly 200 essays over 600 plus pages that relate the most current scientific activities. One aspect that makes the book appealing is that each of these pieces by well know and or expert authors is short for quick reads and sharing (average 3 or so pages). Some have complained that there is not an overall theme, but reading along what came through to me was the answer to the Edge question about what is important or worth knowing as well as general themes related to recent scientific news and its bearing on our society. There do seem to be themes among the collection of articles. For example, there are early articles about climate science, then a series of pieces on updates regarding Large Hadron Collider findings, other developments in physics and astronomy (e.g. re gravitation waves, survey of Pluto), then material on gene editing (CRISPR), the brain, computing, new imaging tools and other matters. Among my favorite pieces include the Preface by John Brockman (page xxxvii) relates why science information is the news that stays news. Quoting Stewart Brand from his own *Third Culture* essay from 1991, he indicates that *Science is the only news. . . [A]ll the human interest . . . the politics and economics [are] the same sorry cyclic dramas. Human nature doesn't change much; science does, and the change accrues, altering the world irreversibly. It is helpful to read such wisdom when dealing with what some now are calling The Trouble with Reality* (see my review of Brook Gladstone's book by that name). Then, there is the first essay by Harvard Psychologist Steven Pinker entitled *Quantification of Human Progress* (page 1) where he speaks about different ways of looking at the activities of our species and whether we are advancing overall. Given all the different indicators of ups and downs, he concludes that such measures are important in giving some basis for improvement. He ends saying *The empowering feature of a graph is*

that it invites you to identify the forces pushing a curve . . . and then to apply them . . . It was reinforcing for me to see the inclusion of authors whose books I have reviewed where their pieces provide updates or supplements to their work. For example, see my reviews of Sean Carroll's *Particle at the End of the Universe*, Rudy Rucker's *Mind Tools*, Lisa Feldman Barrett's *How Emotions Are Made*, Paul Saffo (along with Robert Johansen, David Sibbet, and others) *Leading Business Teams*, Eric Topol's *Creative Destruction of Medicine*, Kevin Kelly's *The Inevitable*, and Keith Devlin's *The Unfinished Game*. In a similar vein, it was good to come across additional authors with whom I have been familiar such as Mary Catherine Bateson, Lisa Randall, and Douglas Rushkoff as well as others who I had not heard of before. As I write these words a smile comes to my face as I hear on BBC radio about a Chinese experiment related to Einstein's predicted "spooky action at a distance" or quantum non-locality as described in Cambridge Professor Ross Anderson's *Replacing Magic with Mechanism?* (page 131). Also, in the final essay in the collection, *Envoi: We May All Die Horribly* (page 568), Stanford Biology Professor Robert Sapolsky, writes about the containment of the Ebola epidemic saying ". . . it's a rough approximation of how science can save us. It would be nice if the general population thought the same. Read *Know This* to learn of recent developments and share your learnings with your neighbors to help more appreciate science as news that stays news.

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