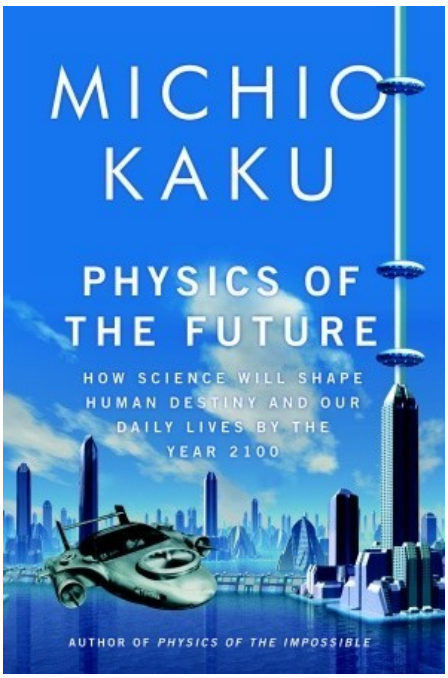

Physics of the Future: How Science Will Shape Human Destiny and Our Daily Lives by the Year 2100

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Space elevators. Internet-enabled contact lenses. Cars that fly by floating on magnetic fields. This is the stuff of science fiction--it's also daily life in the year 2100.

Renowned theoretical physicist Michio Kaku details the developments in computer technology, artificial intelligence, medicine, space travel, and more, that are poised to happen over the next hundred years. He also considers how these inventions will affect the world economy, addressing the key questions: Who will have jobs? Which nations will prosper? Kaku interviews three hundred of the world's top scientists--working in their labs on astonishing prototypes. He also takes into account the rigorous scientific principles that regulate how quickly, how safely, and how far technologies can advance. In *Physics of the Future,* Kaku forecasts a century of earthshaking advances in technology that could make even the last centuries' leaps and bounds seem insignificant.

Physics of the Future: How Science Will Shape Human Destiny and Our Daily Lives by the Year 2100 Details

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From Reader Review Physics of the Future: How Science Will Shape Human Destiny and Our Daily Lives by the Year 2100 for online ebook

Daniel Clausen says

A fantastic journey into the future of science, technology, and humanity.

Pamela (slytherpuff) says

See more of my reviews at Bettering Me Up.

I was really disappointed in this book. I was expecting more information on physics (darn the title for misleading me!) and was instead presented with a book about the future of technology. Which is cool, since that's my field of expertise and I've seen some of the things that Kaku mentioned in the book.

There were some glaring omissions (where is Virgina Tech's CHARLI? And no DARwin? He's the RoboCup champ, for goodness sake!) in the AI section, though it's possible I skimmed over them while my mind was wandering. I'm not going back to check.

After I finished the first two chapters, I could read no further.

The writing made me cringe. I'm surprised that an editor didn't catch some mistakes: lack of proper grammar (especially colons and semicolons); repeating information from previous paragraphs; cliches and hyperbole; and so on.

Kaku repeated the phrase "it may take decades to accomplish this feat" over and over. And over and over and over. Well, yes. This is a book about the future, right? (Darn the misleading title again!)

Michael says

Lot of thrilling stuff here in one competent package from a scientist who puts on a futurologist’s hat to give us a tour of how far science will advance and change society over the next 100 years. His topics cut a broad swath with chapters on each of the following: computers, artificial intelligence, medicine, nanotechnology, energy, space travel, wealth, and humanity’s stages of civilization. It’s fun to hear from a knowledgeable writer just how likely it is we will achieve many of the themes of science fiction.

Ordinarily, I digest technological progress in little blips of news pieces or brief magazine features that tend to bounce off my mind. I know from my own experience how science accomplishments get hyped and distorted in the media. For these reasons, it was very satisfying to get updates and reasoned projections on a wide variety of fields of work

The doubling of computer processing power each year has gone on for decades, conforming to Moore’s Law.

Continued shrinking of transistor size driving this progression will soon reach a limit based on quantum limits to how small circuit templates can be etched. Still, before that limit is reached, computing capacity will be astounding and cheap processing power will be emdedded everywhere imaginable. Some of you will have played with the Android mobile phone voice interface Siri. I asked it "Why is There Air?", and in seconds it gave me a link to the Bill Cosby routine video from 1964. Pretty handy power already here. The recent release of Google glasses points the way to where portable computing combined with wireless Internet access might take us. Kaku projects that the only screen we will need in the future will a transparent one within contact lenses. Circuits with microlasers are under way that can beam data or video images right on the retina.

Computing power readily translates into great success in playing chess, which is based on picking the best move from projecting zillions of possible responses of the opponent. However, true artificial intelligence (AI) progress is stuck in a rut. Attempts to program in autonomy are stymied by barriers in achieving performance based on common sense, and pattern recognition is barely at the level of the mosquito. But “bottom up” approaches for robots learning from errors are beginning to hold promise, and simulations based on brain circuitry are becoming a focus. On the question of when computers with advanced articifical intelliegence will achieve self consciousness (“singularity” in sci fi parlance), Kaku doesn’t know whether to side with those that say 20 years, others who say 100 years, or still others who say never. Unlike the Termnator scenario with Skynet starting a machine-human war, the author thinks we will make sure our robots are kind, addressing the contradictions possible in Asimovs 3 laws and avoiding the temptation to automate Predator drones in warfare.

The medicine section of the book was fun for me due to my background in biomedical science and recent work on telemedicine programs. Having a computer interface through contact lenses and wireless voice control should prove pretty effective in medical care and emergency medicine. Kaku book predicts that within 100 years humans will to be able to control computers with their mind. Already we have paraplegics with scalp sensors linked to computer controls that they can write email and play 3D games. Next will be mind-controlled arms and legs for such patients. So maybe we won't have war with machines like Terminator movies make hay with. Biotechnology fused with nanotechnology has a lot of room for speculative scenarios. And if the genetic folks look like they are headed toward bringing back the mammoth, should we try to recover the Neanderthal? Would we put them in a zoo or Harvard? Are we on the way to being able to make a Jurassic Park? Though DNA is too degraded, maybe we can make a generic dinosaur by interpolating between bird and lizard genomes to recreated the ancestral genes. If the snake retains the genes for legs in a suppressed state, maybe some ancient genes are already in there.

Nanotechnology’s promise of “making something from nothing” is still far from achieving machines that can carry out molecular assembly from raw materials. Still Kaku does a good job in covering early stages in progress along these lines and the technical issues involved. He has a nicely concentrated discussion over the implications of a future society where jobs and work are largely unneeded. The worker’s mantra of “each according to his ability” will change into “to each according to his desire.” Similar to many sci fi renderings, many believe that:
…without the motivating factor of scarcity and money, it could lead to a self-indulgent, degenerate society that sinks to its lowest level. Only a handful of the most artistically motivated will strive to write poetry. The rest of us, the critics’ claim, will become good-for-nothing loafers and slackers.

For the future of energy, he is deft and informative about progress on initiatives such as hydrogen powered cars, fusion plants, solar energy plants in orbit, and frictionless transportation using magnetic lifting driven with superconductivity. For the future of space travel, he seems reasonable in his projections for colonies on the moons of Earth and other planets and exploration of asteroids. Serious work is going on the dream of a

space elevator, but prospects for massive production of materials strong enough to sustain such a device are unclear. Kaku favors the likelihood of detecting an alien civilization, but he is pretty cautious in predicting the sci fi dream of spaceships with “ramjet” engines scooping up hydrogen as fuel for a fusion engine or with antimatter drives. Instead he seems to favor unmanned interstellar exploration by tiny craft with self-replicating miniature robots, possibly in the form swarming nanobots that can join up in various ways to morph into diverse machines.

The book is an easy read for people with only modest scientific literacy. For sci fi fans, it should whet their appetite even more for wonders of the future.

Mike Mullin says

Excellent when Kaku focuses on technology, physics or string theory. When he veers onto other topics such as history, education, or culture Kaku produces about one WTF? statement per page. Not only are his opinions on these subjects often totally unsupported by evidence, they occasionally contradict other assertions found a few pages away. Even when Kaku sticks with what he knows, his predictions for the future seem almost laughably optimistic and naive. Every problem has a technological solution that, like a glittery rainbow unicorn, will swoop down to make us happier and wealthier. Never mind that all technologies have dark sides--in one blackly humorous passage Kaku extols the virtues of antimatter as rocket fuel while briefly sweeping over its potential as a global suicide device. By the fiftieth time Kaku used the phrase "In the future," I was thinking: In the future, we'll all have access to drugs as good as the ones Kaku's taking right now.

Fred Forbes says

I had the pleasure of hearing Michio Kaku speak at a convention and figured if his books are as thought provoking as his speeches, I should grab one. He does write well but I think the title of this one is a bit misleading. It ranges far beyond physics to a variety of sciences to lay out a timeline of coming advances but most importantly it goes far beyond science to human relationships, economics and trade and personal lifestyle. Probably the most intriguing development to me it the incorporation of computers into a contact lens that is capable of being controlled telepathically and that can perform all the functions that current machines do and more. Pick up a copy in a bookstore or library, read the last section which describes a "day in life" of a person on New Year's day in 2100. If that doesn't pique your interest in knowing how he got there, probably not your type of book, but it was certainly mine!

Colin Bendell says

Wow. I'm super excited about the future! Michio Kaku connects work being accomplished the labs with the applications in the future. This isn't about imagining some mythical utopia, but looking at the discoveries and inventions that exist today and how they can be combined and utilized in the future once the economies of scale and mass production are flushed out.

For example: We already can remotely control micro robots and we have the ability to analyze cells on a

single micro chip. In the future we should be able to inject micro controlled robots into the blood stream that then can perform biopsies and analyze the results instantaneously.

The only odd thing about the book is that Kaku seemed to reference 'Pentium' chips numerous times in the first half. It was almost as if the first part of the book was written a decade ago when people still knew what Pentium chips were.

On a personal note, I am not filled with dread of a future when moores law has hit a physical ceiling where chips can't get any faster. What will we do?!

C.W. says

Thoroughly engrossing, entertaining, interesting, and well put together; I enjoyed listening to this a lot, and thought it gave a great and insightful look into things that I don't know anything about. But now I kinda do! Michio Kaku made it all accessible while not dumbing it down at all - he's just got a great writing voice and way of expressing things that's easy to follow. Obviously knows what he's talking about and cares about giving you as much information, in as engaging a way as possible. In general just a lot of fun to read and experience!

Kim Pallister says

This was a horrible book. I gave up on it a third of the way through. I'm not sure why people give the author high marks. Perhaps his earlier works are better and he phone this one in.

The book claims to look at scientific advances in a number of fields (computers, biology, etc), and drawing from interviews with hundreds of leading scientists, make predictions about the next 90 years.

What it does instead is the worst kind of pop-science futurism. The author picks and chooses from science that supports his favorite hypotheses, and then draws them out to extreme predictions. In doing so he pays almost no attention to factors that could influence other directions, gives no insight into his calculations (if any were done) on how to get to the endpoint. I'm OK with the idea of making concepts accessible to the layperson, but the leap from there to "trust me, I'm a scientist" is one that goes too far.

In addition, the areas of the book he covered that I have some expertise in (silicon design and manufacturing, augmented reality, virtual reality) were so riddled with error, unimaginative future use cases, and misuse of terminology, that I couldn't trust him on other areas in which I'm not an expert.

To add insult to injury, he uses a horrible amount of adverb-laden hyperbole. The first chapter alone had enough "we will have the power of the gods of mythology!" mentions that I almost didn't make it to chapter two.

Gendou says

This books is more about the TECHNOLOGY of the future than the physics thereof.

Really, if you've kept up with Tech news, you can just skip reading this book...
I counted no fewer than 34 references to "God" or "gods", a bad sign on it's own.
There is more time dedicated to ancient mythology than to actual physics!
The most annoying is the **indicative future** used without proper qualifiers.
For example, he says something "will happen", instead of examining the LIKELIHOOD that it will happen.
This is Kaku's worst writing habit, his hyperbolic/extreme language a close second.
He loves to use words like "telepathy" and "magic" when he really means mind-machine interfaces and advanced technology.
His over-confident tone is made worse by the preposterousness of some of the claims!
Kaku bizarrely champions Kurzweil and like-mined wearers of tinfoil hats.
The whole singularity silliness is transparent nonsense to computer scientists.
Kaku's proposed "Caveman principle" is moronic, he really needs to re-read "The Selfish Gene"...
This book is full of historical inaccuracies, if not dubious over-simplifications.
Kaku blames human aging on 2nd law of thermodynamics, which is entirely incorrect.
Aging is caused primarily by the shortening of telomeres, which is controlled by the genes.
He goes on to correctly describe this, but his description contradicts this prior, false claim.
The book is full of these outrageous claims which seem not to be meant literally at all.
Rather, his writing style is to vomit extreme sounding language at the reader, presumably for entertainment.
This "Discovery Channel" bullshit is horribly offensive, and intellectually dishonest.
Kaku colorfully describes frogs and flies as "lower organisms", as if to mock readers with a High School education.
As if to prove how out of touch he is, Kaku proposes it will soon be common place to have one's genome on CD-ROM.
CD-ROM? Who still uses CD-ROMs?! Get with the program, grandpa!!
I can't count the number of times I vented my frustration by saying "cool story, bro" aloud while reading this book...

On a lighter note, the book includes a good commentary on economic bubble, and the changing world of music/newspapers.

The final message of the book is that "the people living today are the most important ever".
This is justified by our being the generation building a "planetary civilization".
I can't stand this sort of arrogant, self-centered grandiosity.

Max says

A light fun albeit selective exploration of the future of technology. From internet connected contact lenses and magnetic cars to starships and designer children, Kaku identifies many of the possible advances to occur in the next 100 years. If his optimistic presentation holds it will be a great time to live.

His greatest concern seems to be global warming which in his hopeful projections, mankind is able to handle. However he just touches the problem of man’s violent history and leaves out the future of weaponry and other sinister uses of technology. With all the conflict in the world as I read this from the Ukraine to Africa to the Middle East to Ferguson Missouri, it is hard for me to feel as upbeat as the author.

Kaku’s wondrous world of 2100 could be, but will it? Perhaps his quote of Gandhi at the end best expresses the challenges we humans face to make it another 100 years:

The Roots of Violence:

Wealth without work,
Pleasure without conscience,
Knowledge without character,
Commerce without morality,
Science without humanity
Worship without sacrifice,
Politics without principles.

Robert Kroese says

I got this book out of the local library because I heard the author on NPR and the book sounded interesting. I'm doing research for a near-future sci-fi novel and this sounded right up my alley.

First of all, the title is a misnomer. This book should be called Technology of the Future, as it's only tangentially about physics. The prose is painfully bad at times, tending toward cliches and mixed metaphors. Consider this gem, for example:

"Like a kid in a candy store, he delights in delving into uncharted territory, making breakthroughs in a wide range of hot button topics."

Or this one:

"In a word, perhaps no."

I found the references to Greek mythology and current cinema strained and pointless, and most of the content of the book is dumbed down to an almost ridiculous degree. It's also somewhat vague, repetitive and occasionally self-contradictory. Kaku is very "gee whiz isn't this neat" about everything and his attempt to deal with the social and ethical ramifications of the technologies he's gushing about read like essays written for a high school English assignment.

Still, there are some really cool ideas hidden amongst the nonsense, so if you get the book from the library like I did and skim through all the blather, it's worth picking up.

Efka says

Apie ši? knyg? galima kalb?ti daug ir ilgai, bet pakaks pasakyti tiek: jei išsipildys bent tre?dalis to, k? Michio Kaku numano, kaip galim? žmonijos ateit?, mes iš esm?s b?sim dievais. Bent jau pagal tradicin?, antikin? ar pagonišk?j? diev? supratim?.

Taip, yra ir ?ia keist? prognozi?. Yra ir toki? prognozi?, kurios jau po keletos met? po knygos išleidimo nepasitvirtino ("Naftos barelis šiuo metu kainuoja apie 120 doleri? ir nepanašu, kad ateityje d?l ko nors ši kaina tur?t? kristi"), bet yra ir toki? prognozi?, kurios aiškios, tik?tinos ir skamba labai logiškai.

Ši knyga yra žinojimo kvintesencija. Perskaityti j? beveik privaloma kiekvienam save gerbian?iam fantastui, technokratui ar šiaip apie ateit? smalsaujan?iam žmogui. Bet be viso to, dar reikt? nepamiršti, k? sak? I. Asimov'as, kurio teigin? šioje knygoje citavo ir Michiu: "Li?dniausias dabartin?s visuomen?s aspektas yra tas, kad mokslas žinias kaupia grei?iau, nei visuomen? išmint?." Tod?l reikia tik?tis, kad mes, žmonija, sukaupsime ir išminties, nes informacija be jos - tik šlamštas.

Marty Essen says

This is probably not a book some hard-core science fuddy-duddy is going to enjoy. But if you are just fascinated by learning new things or contemplating the future, this soft-core science book is for you.

For me, any book that makes learning fun is a good one. Just think of how many people will pick up Professor Kaku's book that haven't read much more than a science-related newspaper article since high school!

My favorite sections of Physics of the Future were the chapters on the Future of Energy (especially his discussion on global warming) and the Future of Space Travel (especially his discussion on nanoships). But so much is covered here that most people will find something that piques their interest.

Professor Kaku has a gift for making learning about science wonderful and exciting. And in this book, he'll make you "think of the possibilities!"

Marty Essen, author of Cool Creatures, Hot Planet: Exploring the Seven Continents

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Sam says

I read a couple hundred pages on an airplane, and I regret having made an impulse-purchase of this book in the airport bookstore. Like others, I was disturbed by the poor writing (annoying tone, repetitive and useless allusions to mythology, weird Star Trek obsession...). And as others stressed (and which if I'd had more time before my flight I might have realized by skimming more thoroughly before purchasing), this book has practically no physics in it. At some point I might go back and read some of Kaku's predictions in more detail, but on the whole they strike me as no more illuminating than the guesses of anyone even modestly familiar with some of the early-stage technologies the author is riffing on. In particular, there is very little depth in his analysis of the impact caused by various technological shifts. For (what strikes me as) more incisive futurism, I suggest the work (especially on "ems" or whole-brain emulation) of economist Robin Hanson.

Faith says

I had not heard of this author until I read that former President Clinton was reading a couple of his books. Now I plan to read more by him. This book gave me a lot to think about and explained technology and concepts in a way that made them accessible to me. Fortunately, the author writes about a lot more than physics. He covers many areas of the sciences and social sciences and interweaves ideas from various disciplines in a comprehensible and entertaining manner.