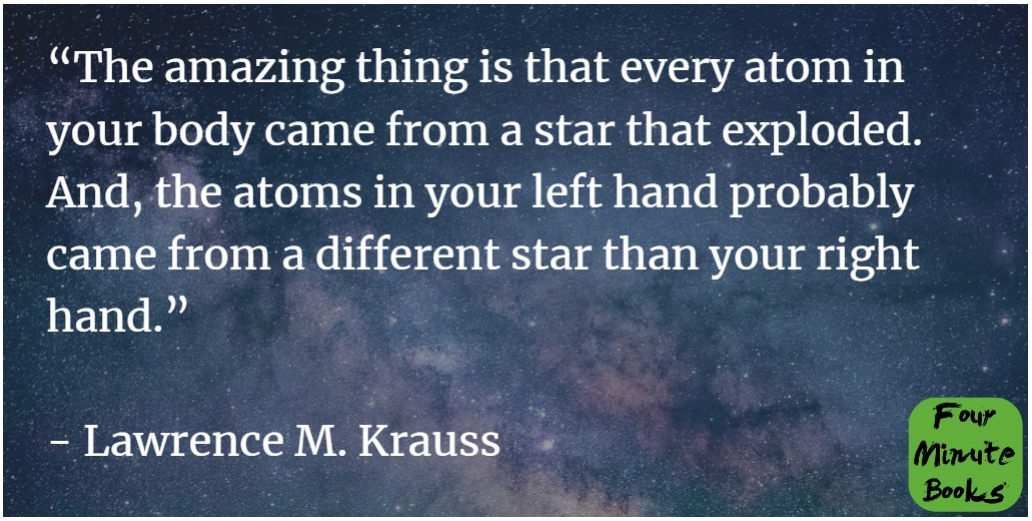
A Universe From Nothing Summary

1-Sentence-Summary: *A Universe From Nothing will enlarge your knowledge of our expanding universe by showing you how it began, what we're learning about it now, and what will happen to it in the future.*

Read in: 4 minutes

Favorite quote from the author:



When I was a kid I would sleep with my head at the foot of my bed so I could gaze at the stars as I drifted off each night. I loved recognizing constellations like Orion and the Big Dipper, seeing the moon, and wondering what was out there.

As I grew, my love for the stars did also. I got a telescope for my eighteenth birthday and still remember the night I found our neighboring Andromeda galaxy in it. Excitedly I told my family members that the image we were seeing that night was about 2 million years old!

If you're fascinated by the stars and our universe then you're going to love Lawrence Krauss's *A Universe from Nothing: Why There Is Something Rather than Nothing*. It'll show you the origins of the great expanse, what we're learning about it today, and even what the end of it all will be like.

Here are my 3 favorite cosmic lessons from this book:

1. Scientific research confirms that the expansion of our universe is real and is getting faster.
2. If you think there's nothing in the billions of miles between planets, stars, and galaxies, you're wrong.

3. Eventually we will only be able to see our own galaxy due to the expansion of our universe.

Get your telescope ready, because we're about to go on a journey to the stars!

Lesson 1: Our universe is expanding and doing so faster each day.

Everything we know began in the big bang 14 billion years ago. A lot has happened since then, including a lot of expansion of human knowledge about outer space. We've come a long way since thinking that the Earth was the center of our solar system!

Today we know through observation that our universe is expanding. Physicist George Lemaitre predicted that the theory of relativity that came from Einstein meant that our universe was not stationary but growing. Even Einstein rejected this theory, but not long after he was corrected by observation.

To understand how scientists figured this out, you need to know about the Doppler Effect. If you're sitting somewhere that you can hear the cars going by, you'll notice that the noise a car makes is different as it moves past you. Take a moment and try it out yourself, it's pretty interesting!

Research confirms that this same effect happens with light. Objects that are moving away from us have different shades of color than those heading in our direction. **In observation of the colors that celestial bodies have, researchers found that almost everything in our universe is moving away from us.** Looking more closely, they've discovered that the farther away an object is, it is moving away more rapidly. This confirms the theory that our universe is expanding faster.

Lesson 2: Dark energy and dark matter fill what we think of as emptiness between what we can see in our universe.

So we know that the universe is expanding, but what is causing this? Just as blowing a balloon up requires air, so does our universe have a force pushing it outward. The trouble is, there's nothing we can observe that's causing this. Physicists thus call this force in empty space "dark" energy. But they still can't explain where this propelling force comes from or even what it really is.

In addition to this mysterious energy, scientists have also discovered that most of the universe is invisible. They call this *dark matter*, but that's a little confusing because we can't see it. A better way to think of this unknown substance is invisible matter due to the fact that it's not visible to any of our instruments.

So how did we discover these strange pieces of our universe? **Calculations to determine the rotation rate of our universe show that there must be more mass than we can see.** In other words, the observable universe just isn't heavy enough to cause the speed at which we are rotating. Thus, invisible matter must exist.

Next time you look up at the night sky and see the darkness between stars you can remember that there is an invisible something there pushing our universe outward.

Lesson 3: Although we can currently see neighboring and even distant galaxies, eventually our expanding universe will make this impossible.

Alright so we've mentioned the invisible part and the observable section of our universe. But there's another area of the great expanse we haven't discussed. That's the part of the universe that we cannot see because it's too far away.

Outer space is really big. It's so vast that we have to speak in terms of light years, or how far light travels in one year. As I mentioned before, when I was looking at the closest galaxy to ours, it was two million light years away! But most objects are much farther than that. Some are so far away that their light will never reach us. And the number of celestial bodies that we can't see is increasing.

Think of the example of a balloon expanding again. Pretend you're blowing up a balloon and that it represents our universe and can grow outward forever. **Because it's "blowing up" faster each day, eventually everything will be so far apart that not even the light from other objects will reach us!**

That means that scientists trillions of years from now will have no celestial evidence of the Big Bang, dark matter and dark energy, or the expansion of the universe. They would wrongly conclude that our stationary, unmoving galaxy is all that exists.

A Universe From Nothing Review

I've always loved learning about space and our universe, and *A Universe From Nothing* didn't disappoint. While some of the concepts in this book are complex, I like how it explains them in a way that we all can understand. The attachment to the dogma that science rules over faith was a bit much for me, but I still enjoyed this book and think you will too!

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Who would I recommend the A Universe From Nothing summary to?

The 20-year-old college physics student who is curious to know more about how our universe began, the 54-year-old who is fascinated by the stars and wants to understand them better, and anyone who wants to learn about the past, present, and future of our universe.