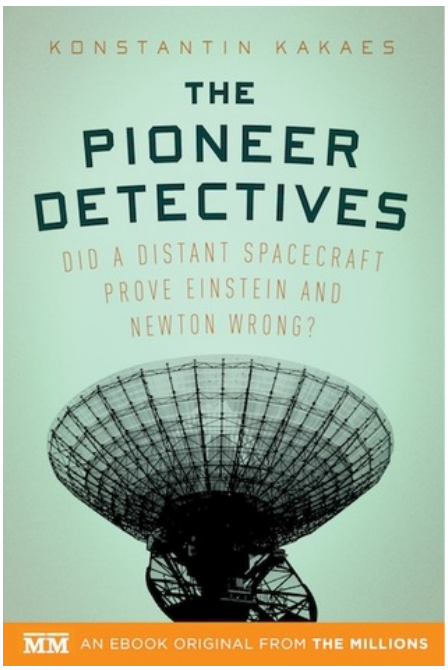

The Pioneer Detectives

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Explore one of the greatest scientific mysteries of our time, the Pioneer Anomaly: in the 1980s, NASA scientists detected an unknown force acting on the spacecraft Pioneer 10, the first man-made object to journey through the asteroid belt and study Jupiter, eventually leaving the solar system. No one seemed able to agree on a cause. (Dark matter? Tensor–vector–scalar gravity? Collisions with gravitons?) What did seem clear to those who became obsessed with it was that the Pioneer Anomaly had the potential to upend Einstein and Newton—to change everything we know about the universe.

With riveting prose and the precision of an expert, Konstantin Kakaes gives us a scientific police procedural, tracking the steps of those who sought to unravel this high-stakes enigma. His thrilling account draws on extensive interviews and archival research, following the story from the Anomaly's initial discovery, through decades of tireless investigation, to its ultimate conclusion. "The Pioneer Detectives" is a definitive account not just of the Pioneer Anomaly but of how scientific knowledge gets made and unmade, with scientists sometimes putting their livelihoods on the line in pursuit of cosmic truth. Perfect for fans of John McPhee, Thomas Kuhn, and Ed McBain, this is also an immensely enjoyable story accessible to anyone who loves brilliant, fascinating long-form journalism.

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ABOUT THE AUTHOR: Konstantin Kakaes is a Bernard L. Schwartz fellow at the New America Foundation, writing about science and technology, and is the former Mexico City bureau chief for The Economist. His work has been published in The Wall Street Journal, Foreign Policy, and The Washington Post and appears frequently in Slate. Before becoming a journalist, he studied physics at Harvard University.

The Pioneer Detectives Details

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From Reader Review The Pioneer Detectives for online ebook

Franz says

The Pioneer space probes, launched in the early '70s, appeared to travel infinitesimally slower than Einstein's theory of general relativity would predict. Was this evidence that Einstein's theory was wrong? If not, what was causing this strange anomaly? Pioneer 11 surprisingly remained in communication with scientists on earth decades beyond its predicted death. Kakaes describes the painstaking efforts of dedicated scientists who accumulated and analyzed the sparse and often corrupt data sent faintly from well beyond Neptune, far beyond the limits of our solar system. Finally, in 2012, the researchers published their results.

An engrossing book, relatively short. I read it on one long sitting today. I can't claim to understand all the physics or explanations; I'm just not geeky enough. But anyone with only a slight familiarity of physics will get some benefit. Written for the general reader who is curious about how the world works.

Sid says

Good read if you like space and science. Be warned that the book is quite technical. While you dont need to know anything fancy, you need to have an appetite for some technical discussions.

The book is about an investigation into an unknown acceleration that was impacting Pioneer 10 and the story behind trying to decode it. The author gives a good background into the problem, and the people behind the investigation. The underlying theme of the book is a meta discussion on the scientific method and how theories and experiments are rarely as clear cut as it may seem to the general public. This is a pretty short book, that tackles a single subject in detail.

Mary says

The Pioneer Detective is about a small group of scientist who discover an anomaly in some of the data with regard to the speed of travel of the Pioneer 10 & 11 satellites. Unless explained this data would call into questions Einstein's Theory of Space and Time.

This short work is the story of scientists investigated, theorized, and ultimately reconciled the data. A really interesting read that provides an example of how scientific theories come into being, how they are tested, and how dedicated and intelligent these scientists were.

For lovers of popular science.

Chazzbot says

Great science essay that explains a compelling mystery, clearly explains the science behind the investigation of the mystery, reveals the personalities of the scientists engaged in the mystery, and underscores the

significance of the scientific method.

Though the mystery itself involves some complex theories about how gravity works (or doesn't), the writing here is always clear, and can be easily understood by anyone interested in the story. What makes this essay better than most is the time Kakaes takes to tell the background stories of the scientists involved and the arduous process of collecting the necessary data from a space probe that many at JPL had abandoned. Kakaes also details the complications of pulling information from outdated technology, and hints that our own sense of history is threatened by the same process.

There are also some great tidbits here regarding the plaque placed onboard Pioneer 10 (a precursor to the golden records on the Voyager probes), and which scientist could not resist putting his fingerprint on it.

Highly recommended for space enthusiasts, or anyone interested in learning why the scientific method is so important.

Quartzen says

This was a fascinating look at the search to figure out why NASA's Pioneer probes accelerated very slightly slower than Einstein's theory of general relativity would predict, an effort spanning decades- nearly the entire careers of some of the scientists involved. The descriptions of the science were clear and easy to read, as were the struggles against outside forces like budgets and data preservation and the excitement of new equipment and techniques that could be applied to the problem, things I find too rarely discussed in popular treatments of scientific research in my reading.

It was really interesting to read about a research effort (view spoiler). If I had one quibble with the book, though, it's that the coda seemed a little bit unnecessarily cruel to one of the primary sources who had spent his life's work on the anomaly in service of a philosophical point about "correct" and "incorrect" scientist reactions to the ultimate findings of the research.

Arun says

Science enthusiasts will love this book! A very well written account of the investigation on the anomalies of the pioneer space probes. It's just amazing to read about how far these probes are and how faint the strength of their signal is by the time it reaches earth. It also gives us an insight on how scientific inquiry works in general to solve mysteries.

Alexey Goldin says

This is a great story about scientists finding a small inconsistency in their measurements, doggedly pursuing it for decades, overcoming animosity from peers and bureaucracy and.... not ending up with great discovery. As it happens almost always. We do not often hear stories like this, usually we read only about happy endings, so we underappreciate scientists effort and sacrifice. Without thousands of not-so-happy endings like this we would not have happy endings like theory of relativity, Higgs boson and pretty much all of modern science. This is a book about the hidden part of scientific process, which is usually edited out for

convenience.

I met Slava Turyshev (one of main characters) while I was at JPL a few times. He is a great person and scientist.

James says

A great book about science, research, and psychology. Quick read. Nothing technical. It's about several scientists' decades long dedication to finding the truth behind an anomaly in the trajectories of the Pioneer 10 and 11 spacecraft - a mysterious, slight alteration in their expected course that challenged Einstein's General Theory of Relativity. The author tells a great story about a couple of scientist who tirelessly researched this issue, but also paints a great picture about the amazing Pioneer satellites, but perhaps the real hero of the story is the Pioneer satellites themselves, which greatly exceeded anyone's expections regarding their lifetimes and the value of the information they returned to earth. The book also touches on the psychology of research, and the unavoidable human tendency to believe what we want, and interpret data to suit our beliefs.

Jason Kirk says

Amazon.com Review: Space exploration's disappointments sometimes yield more dramatic stories than other endeavors' great successes. Case in point: the mystery of Pioneer 10's stubborn refusal to adhere to its projected trajectory. Launched in 1972 and now quietly hurtling well beyond Neptune's orbit, Pioneer 10 drifted hundreds of thousands of miles off course. But why? Could some as yet undiscovered fundamental force have finally tipped its hand? As with most hopes and dreams, the promise of groundbreaking scientific discovery isn't easy to let go, and among *The Pioneer Detectives* , one scientist's refusal to relinquish his belief that the spacecraft's errant path provided the smoking gun for a new physics proves particularly powerful and sad. Another's long and careful journey to the core of the mystery illustrates both the brilliant self-correcting venture of science itself and--more to the point--journalist Konstantin Kakaes's understanding that science stories are, at their base and at their best, human stories. --Jason Kirk

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Karan says

Keeping this one short, as befits a short e-book. I read this while waiting for an interminably delayed flight to take off from San Diego International Airport, fully expecting to have to give up on it after a bit and seek lighter reading. To my surprise, I found myself engrossed, and quickly at that.

The Anomaly (with a capital A, it was that Anomalous) was simple: the Pioneer spacecraft had been found to be accelerating just _slightly_ faster than predicted by Einstein’s theory of general relativity. The book is the story of the Anomaly and the people surrounding it: how it was discovered, how it shaped careers and lives and how, anticlimactically, it was ultimately resolved by building an elaborate thermal model of the spacecraft that showed that the Anomaly arose from the fact that one side of the Pioneer probe was slightly hotter than the other.

Kakaes has a firm grasp of the science, exhibited through lucid, easy to follow explanations woven in throughout the book. However, what really brings The Pioneer Detectives to life is the fact that Kakaes is

equally gifted at telling the stories of the people whose lives the Anomaly touched. Perhaps the one flaw of the book is that it left me asking for more, disappointed with the conclusion; in the real world, it turns out, stories often conclude in a less-than-poetic way. (But of course, this is arguably the world's, and not the book's fault.)

Gendou says

I wanted to hate this book. The tabloid question that is its subtitle is really annoying. Spoiler alert, the answer is no, the Pioneer Anomaly does not prove Einstein and Newton wrong. It was explained away as a result of heat dispersion. The beginning of the book was full of tabloid nonsense, too, like calling gravity a mysterious force. I forgave Kakaes by the end of the book, which is wonderful and reads like poetry.

Jim says

Fun little Kindle Single. A geek detective story. The Pioneer 10 and 11 spacecraft, the first spacecraft to visit Jupiter and Saturn now headed for the star Aldebaran that it will reach in 2 million years (if the Klingons don't blow it away first), began exhibiting some anomalous distance and velocity readings. For over a decade a few intrepid scientists at JPL, Ames Research Center, and a few volunteers worked to track down the source. With some hoping this might herald a flaw in Einstein's theory of relativity, and possibly new insight into gravitational theory, they finally figured it out. I won't spoil it here, but the fun in this is not the destination, but the journey. Well written and quite worth an hour or two of your time!

Keeley says

This is a quick and engaging popular-science book, recounting the history of a challenge to Einstein's Theory of General Relativity, which describes the workings of gravity. The challenge arose from anomalous data about the travels of the Pioneer 10 spacecraft. Kakaes lays out his tale with the clear language and assured pacing of an experienced journalist, and in many ways the book felt like a really good piece of long-form journalism (say from Slate or The Atlantic), without all the ads. In fact, if I have one criticism for the book, it is that it could have been longer. There were a lot of interesting hints about NASA politics, international trends in scientific research, and our understanding of the solar system -- any of which could have been expanded into a chapter. The flip side of this, though, is that the book stays focused. It's the first book I've read in an e-reader format, and seemed pretty ideally suited for it: interesting, short, not convoluted, good layout, sparing endnotes.
If you're interested in astronomy, or any popular-science topics, you will enjoy this book. As someone who hasn't studied any physics since high school and avoided most college science, I was able to follow most of the text and only skimmed through a couple of sentences. So, if you're not a science buff but you like learning new things about history, policy or exploration, you should be able to enjoy it too.

Jim says

The Pioneer I and II space probes are 200,000 miles short of where they should be. Over millions of miles

this amounts to 0..02% anomaly, but nonetheless, an anomaly. This anomaly challenges Einstein's theories of gravity, dark matter and dark forces. The data streams for twenty years were analyzed down to the minutest detail included momentum of the radio signals that were sent from the Pioneer space probes.

The answer was in the differential heating of the spacecraft by the sun and the radioactive energy sources within the Pioneers themselves. A short interesting book about space travel and science.

Peter Williams says

I have ways had a childlike interest in space and although in no way do I profess to understand the nuances of the actual physical science discussed in this short informative book, Kakaes has written it in such a way that mere mortals can understand without dumbing down in the writing style and form. Basically a large journalistic piece in which the passion of the author is in no way hidden. A very interesting and at times mind blowing read when you try to comprehend the distances that this space probe has travelled.
