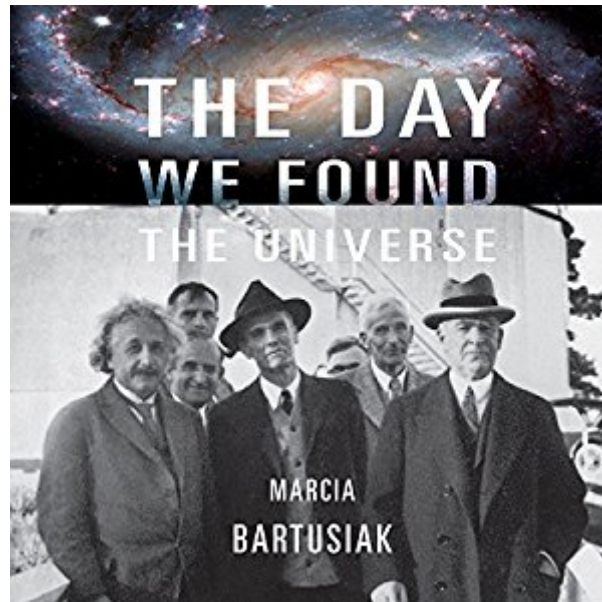




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# The Day We Found The Universe



## Synopsis

The riveting and mesmerizing story behind a watershed period in human history, the discovery of the startling size and true nature of our universe. On New Years Day in 1925, a young Edwin Hubble released his finding that our Universe was far bigger, eventually measured as a thousand trillion times larger than previously believed. Hubble's proclamation sent shock waves through the scientific community. Six years later, in a series of meetings at Mount Wilson Observatory, Hubble and others convinced Albert Einstein that the Universe was not static but in fact expanding. Here Marcia Bartusiak reveals the key players, battles of will, clever insights, incredible technology, ground-breaking research, and wrong turns made by the early investigators of the heavens as they raced to uncover what many consider one of most significant discoveries in scientific history. --This text refers to the Paperback edition.

## Book Information

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## Customer Reviews

Ms. Bartusiak's book reads remarkably like a novel, with considerable drama. It is not hype; there really were high-stakes controversies going on, which the author presents in bold relief. The selection of photos is superb, many from the archives of the Huntington Library. I consider myself fortunate to have been to Mt. Wilson several times, to Mt. Palomar, to Lowell Observatory in AZ, and to the Goldstone tracking station near Barstow. It is like having a front-row seat for much of this history. It is too easy to take for granted the personal risks and responsibility of the scientists involved. The astronomers even risked their lives in doing their work. In some positions of the 100

inch Mt. Wilson reflector, the observer's cage was rather exposed (up in the air), such that it was distinctly dangerous to spend the night sitting there to guide the scope and trying to stay awake. Observational errors could have the effect of sending one's colleagues off on a wild goose chase, requiring considerable effort to recover from. It's interesting to compare the nature of the Copernican revolution to the revolution described in this book. The earlier viewpoint shift moved the center of the Universe from the Earth to the Sun. That was a huge step in the context of the time, but was only the beginning. At the dawn of the 20th Century the "center" had shifted to the Milky Way galaxy. Little did people realize that the Milky Way was only one of billions. What follows should probably be considered a "spoiler" ruining some of the suspense; if that concerns you, bail out right now. Controversies erupted over the technical limitations of observations. Progress was often stymied by the lack of adequate resolving power or light gathering ability of the available telescopes. Thus there were several episodes of dramatic progress as new instruments came online. The Lick observatory in California built a huge refractor that made many discoveries, but it was James Keeler's rescue of a somewhat botched reflector that led the way forward. Reflectors were deprecated at the time, but afterward great new telescopes were all reflectors. The sky contains many luminous clouds, but though they are not all the same, it is very hard to tell which kind is which. Nebulas are gas clouds, while galaxies are star clouds and much farther away. One respected observer, Adriaan Van Maanen, reported seeing motion in several galaxies. This indicated that they had to be nearby, as otherwise motions would not be visible over just a few years. Hubble later showed that the galaxies could not be that close. Van Maanen then tried to retrace how he had arrived at his conclusions -- and could not. He and Hubble had a major falling out, winding up never again on speaking terms. Van Maanen reminds me somewhat of Percival Lowell, who reported seeing "canals" on Mars. Turned out it was an optical illusion that some individuals including Lowell are subject to. That one also set off a wild goose chase. Van Maanen's glitch remains a mystery. The last chapter of the book is titled "Started Off with a Bang". This is currently the "received wisdom" on the subject, but I am skeptical, as was Hubble himself, even though he supplied much of the data leading to that conclusion. Hubble said (and I agree) that the Big Bang is not the only possible explanation, and has several defects as an explanation. So I guess we shall see. Maybe.

This tells the story of how astronomers finally came round to see what Immanuel Kant thought was "obvious," namely that all of the spiral "nebula" were HUGE "island universes" like our entire Milky Way Galaxy, and not merely small proto-solar and proto-planetary disks of condensing gas and

dust. As with all of the Bartusiak books this one too is well-written and easy and fun to read. Especially interesting to me was just how close the Lick Observatory's Director, James E. Keeler, came to figuring out that the island universe interpretation was true, well before Curtis and Hubble finally provided evidence for the claim. Had he but lived a few months longer, Keeler's spectroscopic data of numerous spirals would have cinched the point. Unfortunately, like many others before him, he seems to have balked psychologically at accepting a universe that was so HUGE that even the 200 million stars of the Milky Way composed but one "galaxy" -- a term utilized only later -- among literally trillions of others in the observable universe. Still more unfortunately Keeler didn't live to complete his cutting-edge research, but died of lung failure and/or strokes, in 1900, at age 43!! Another good book which tells essentially the same story is "Man Discovers the Galaxies" by Berendzen, Hart and Seeley. That work came out in 1976 but is still considered the best account of the narrative of the discovery of the enormous size of the universe. That book also deserves 5 stars, IMO, but, while it includes more photographs etc., it doesn't include several very interesting parts of the quest, -- like the story of Keeler's death just on the brink of figuring it all out -- that are included in Bartusiak's more recent book.

Really enjoyed this book. Although sometimes confusing keeping all the names straight and who was doing what it was very enlightening as to how we got where we are today in our knowledge of the universe. Although I don't want to diminish the tasks at hand and the importance of their discoveries it does appear that in some cases it was a matter of being in the right place at the right time. I can't help but marvel at what I can see today with my 12" telescope and CCD camera versus what they could see 100 years ago with their 60". It makes me appreciate what a wonderful time of advancing technology that we are living in now! I think anyone who reads this, whether pro or amateur, will learn something new. Ms. Bartusiak has a very good writing style and does a good job of keeping what might otherwise have been a somewhat dry subject on a very fast moving and interesting level. I have already got another of her astronomy books waiting on my bookshelf. I highly recommend this book.

A thorough account of the history of astronomers attempts to understand the extent of the universe. Due honor is to Henrietta Leavitt who discovered the special class of variable stars that was key to Edwin Hubble's proof of the expanding universe. For those interested in the history of telescopes from their invention forward, this book also provides a thorough accounting of that fascinating story. This is the first book I've read by the author and it may not be the last!

Any book on covering the history of science is fraught with challenges. How do you present the science clearly without over simplifying? When presenting a scientist and their work it is easy to overlook those that contributed to the work. In her book Bartusiak conveys the science of the times, the confusion, contradictions in the data, and debates as they unfolded. And how the work of Hubble and others unfolded our understanding of modern cosmology. She gives proper credit to lesser known contributors, such as Milton Humason whose excellent observational work was critical to Hubble's discoveries. Yet she does not diminish the brilliance of Hubble's work. I highly recommend it to anyone interested in the history of science or astronomy.

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