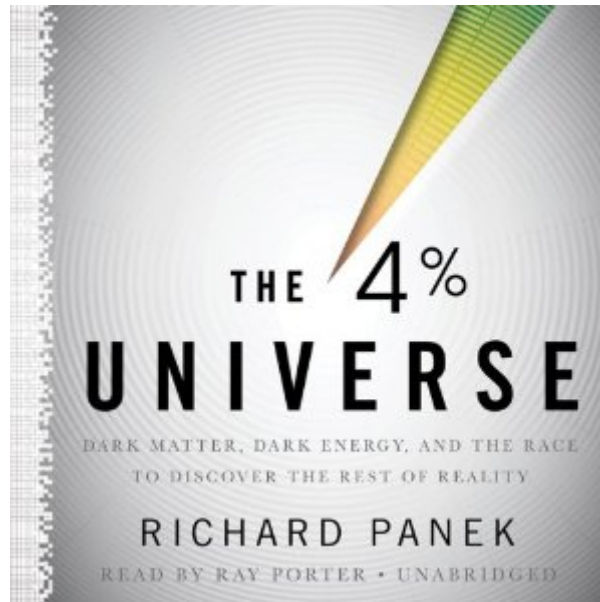


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# The 4 Percent Universe: Dark Matter, Dark Energy, And The Race To Discover The Rest Of Reality





## Synopsis

Over the past few decades, a handful of scientists have been racing to explain a disturbing aspect of our universe: only four percent of it consists of the matter that makes up you, me, our books, and every star and planet. The rest is completely unknown. Richard Panek tells the dramatic story of the quest to find this "dark" matter and an even more bizarre substance called "dark energy". This is perhaps the greatest mystery in all of science, and solving it will bring fame, funding, and certainly a Nobel Prize. Based on in-depth reporting and interviews with the major players—from Berkeley's feisty, excitable Saul Perlmutter and Harvard's witty but exacting Robert Kirshner to the doyenne of astronomy, Vera Rubin—the book offers an intimate portrait of the bitter rivalries and fruitful collaborations, the eureka moments and blind alleys, that have fueled their search, redefined science, and reinvented the universe. The stakes couldn't be higher. Our view of the cosmos is profoundly wrong, and Copernicus was only the beginning: not just Earth, but all common matter is a marginal part of existence. Panek's fast-paced narrative, filled with original reporting and behind-the-scenes details, brings this epic story to life for the very first time.

## Book Information

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## Customer Reviews

I am very impressed by the depth of Panek's research and his ability to summarize a whole century of cosmology in 240 pages, which is crowned with the discovery in 1998 by Perlmutter et al. and Riess et al. of the accelerating Universe and an associated mysterious vacuum or "dark" energy, one of the most important stories in science. As Panek says it, 1998 was a time of inflection in



cosmology since "the Universe wasn't what it used to be". By incorporating the very human side to these developments, Panek achieves a nice balance with the scientific content of the book. At the same time, he makes justice to Cal n/Tololo (C&T) contribution to this amazing discovery, which has been often neglected. A new evidence of this is Robert Kirshner's conspicuous omission of the C&T project in his comment to Panek's book, you can see it at [...]

Central to the book is the supernova experiment consisting in measuring distances to nearby and distant supernovae. As Kirshner says it in his review, this idea has deep roots in astronomy, going back to the pioneering work of Baade & Zwicky in the 30's, Kowal in 1968, Sandage & Tammann in the 70's, Kirshner in the 80's, and of course his group at Harvard in the 90's. Panek does not forget two relevant works in this field: the one by the Russian astronomer Yuri Pskovskii in 1977 who found the first evidence that thermonuclear (called Type Ia) supernovae were not perfect standard candles, and the one by the C&T team including astronomers from the Universidad de Chile (Jos  Maza) and the Cerro Tololo Inter-American Observatory (Nicholas Suntzeff, Mark Phillips and myself)) that provided the pioneering work in the early 90's, that led directly to the discovery of acceleration in 1998.

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