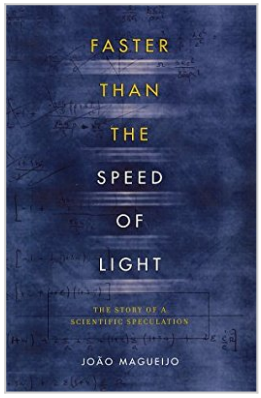

Faster Than the Speed of Light: The Story of a Scientific Speculation

By Joao Magueijo

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Nothing travels faster than the speed of light, and light travels at one fixed speed. This idea is considered a foundation of modern physics, but what if it is wrong?Theoretical physicist Magueijo presents the idea that light traveled faster in the early universe than it does today. The varying speed of light theory solves some of the most intractable problems in cosmology, and could have major implications for the study of physics.

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Editorial Review

Amazon.com Review
Among physicists, it is widely assumed that one's greatest chance for a breakthrough discovery will come before one reaches the age of 30. True or not, this idea leads young physicists such as João Magueijo to pull out all the intellectual stops in the search for glory and immortality. In *Faster Than the Speed of Light*, Magueijo reveals the short, brilliant history of his possibly groundbreaking speculation--VSL, or Variable Light Speed. This notion--that the speed of light changed as the universe expanded after the Big Bang--contradicts no less prominent a figure than Albert Einstein. Because of this, Magueijo has suffered more than a few slings and arrows from hidebound, jealous, or perplexed colleagues. But the young scientist persisted, found a few important allies, and finally managed to shake up the establishment enough to get the attention he merited and craved. Magueijo begins the book with a suitably accessible explanation of special and general relativity, then moves on to the ideas that laid the groundwork for VSL. In the process, he rips the doors off of scientific academia and airs quite a bit of dirty laundry. Comparing himself to Einstein throughout the book, Magueijo approaches his topic and its dissemination with cocksure genius, expecting readers to sympathize with him as he battles to win favor. And we do. The scientific process is "rigorous, competitive, emotional, and argumentative," writes Magueijo. His theory could knock down two solid pillars of cosmology--inflation and relativity. Not only does his radical notion deserve a trial by fire, it also deserves a champion like Magueijo, who isn't afraid of the flames. --*Therese Littleton*

From Publishers Weekly
Could Einstein be wrong and Magueijo right? Equally pressing for Magueijo, a lecturer in theoretical physics at London's Imperial College, is whether the physics editor at the preeminent science journal Nature is in fact "a first class moron" for rejecting his last paper. And did that cosmologist from Princeton steal his idea? What about all those hours wasted writing requests for funding from those "parasites," those "ex-scientists well past their prime" who dispense the monies that make contemporary science possible? Welcome to the world of career science, disclosed here in all its flawed brilliance. Magueijo's heretical idea-that the speed of light is not constant; light traveled faster in the early universe-challenges the most fundamental tenet of modern physics. Deceptively simple, the theory came to the author during a bad hangover one damp morning in Cambridge, England (many of the author's breakthroughs seem to arrive at unexpected moments, like while he's urinating outside a Goan bar). If true, Magueijo's Variant Speed of Light theory, or VSL, rectifies apparent inconsistencies in the Big Bang theory. Magueijo cunningly frames his journey with the stories of other famous, courageous heretics, notably Einstein himself, and one suspects an apologetics at work here. Magueijo, a 35-year-old native of Portugal, is opinionated and can seem immature and almost bratty in his diatribes against the banalities of academia or the hypocrisy and backbiting of peer review. But his science is lucidly rendered, and even his penchant for sturm und drang sheds light on the tensions felt by scientists incubating new ideas. This book shows how science is done-and so easily can be undone.

From Scientific American
Breaking the old speed limit posted by one Albert Einstein in his 20s, this book deploys a racy and provocative text to convey its popularized content of a new cosmology. Jocular, ironic, witty, self-centered, even indignant, Magueijo is all too ready to castigate his adversaries, those comfortable gatekeepers of learning. The author is no aspiring youth but a tenured professor of theoretical physics, age 35. In spite of his own stature within learned gates -- University of Lisbon, then Cambridge on a prime fellowship, now enjoying tenure at great Imperial College in London -- his voice is embittered. This journey of youthful

success is recalled in complaint about the idiots, the sexually deficient, the money wasters. The thin volume is studded with familiar four-letter words, invoked with rude claims about the motives of colleagues, shadowy referees, editors and others encountered. Our current scenario for cosmology clearly opened its second act among the high simplicities of the 1970s with two visible puzzles. Why is 3-D cosmic space accurately flat (like old Euclid's own), although it lies within Einstein's universal 4-D curved spacetime? Why is its content so uniform on large scale? In 1980 Alan H. Guth of the Massachusetts Institute of Technology found a unitary explanation for both riddles. Named inflation, it postulates a minute interval of unusually sudden spatial expansion immediately before the slow, steady expansion of space carried all matter outward. That transient field eventually decayed to yield the complex mix of particles (including radiations) that still move through space. The early push is maintained in the Hubble expansion observably under way, now quite likely speeding up. This very cosmos was in fact described well before any of its complex contents were known. In 1918 Einstein and his friend the Dutch astronomer Willem de Sitter found the broad space and time properties we now believe. Inflation is the repulsive side of gravity's attraction, a kind of matter that stretches cosmic space so fast and far that almost every flaw has been ironed out to approximate local flatness. Our current particle physics allows such behavior, making such a surprise acceptable. Today we freely use what seemed unrealizable in those days. Nobody would have believed the account Einstein and de Sitter arrived at had it not fitted so neatly what we observe. Before and beyond all the starry galaxies, we see a distant uniform surface, the origin of almost all cosmic photons, pure thermal radiation with utter conformity to the established spectrum shape of old Max Planck's. The same temperature is seen at every point of the sky to better than one part in 100,000. Your coffee cream confirms: uniformity in fluids comes from stirring. It is easy to believe that those photons broke free of the expanding opaque plasma, to stream along while much slower action built the lumpy, gravitating assemblages we call galaxies. The time of that breakout was a rough half a million years after the inflationary flash. It is the minor deviations from simplicity that give us any early detail. For the past half a dozen years, the task has been to analyze all those minor flaws as hints of the earliest matter and of its changes and motions as our present cosmos grew. There are no new real puzzles, although certainly a great deal remains to be learned -- most importantly, the dark, enigmatic legacy of AE: his cosmological "constant." The book at hand is a People's Manifesto by an articulate and inventive opposition to the complacent consistency I have just expressed. The author and his colleagues are now skeptical of inflation: it is a tale much too pat, an expansion at unlimited speed. To stir the dense, hot mix in the early epochs, you have to race and beat light itself out to the remote boundaries of inflation. Faster than light? Einstein and his partner admitted only one way this could happen: with repulsive gravity. It is in their theory! Perhaps there is another way, suggests Magueijo. If matter in motion is too slow for light, why not make the speed of light faster and faster into the past? Throwing out heavyweight Einstein and his near constant speed of light is no easy task. Yet that is the burden of the new iconoclasts. Maybe they can make a cosmos with wildly varying speeds of light, and maybe they can keep the gas uniform, but they give no clear reward for so denying our well-tested Einstein on this theorist's journey into the past. Their strongest argument is the very flatness of space: it turns out that a cosmos with a changing speed of light must be a flat one and a uniform one as well, if energy is to be conserved. There is much more to be said about the untested physics of these variable vacuum light speeds. More than one form of theory is out there, to say nothing of the myriad options opened by multiple dimensions. Magueijo sums up with the view that the AE establishment "think they own us; we think ... they are just a bunch of squares.... We have all the fun in the universe." I hope my comments demonstrate that his last remark is wrong; there is fun with Einstein, too, plus plenty of impressive experimental support. As for the true prize, the grandeur of cosmology, neither the Academy nor its clever hecklers have yet grasped its origins.

Philip Morrison, professor of physics (emeritus) at the Massachusetts Institute of Technology, wrote the book reviews and the Wonders column for this magazine for 35 years.

Users Review

From reader reviews:

Lisa King:

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