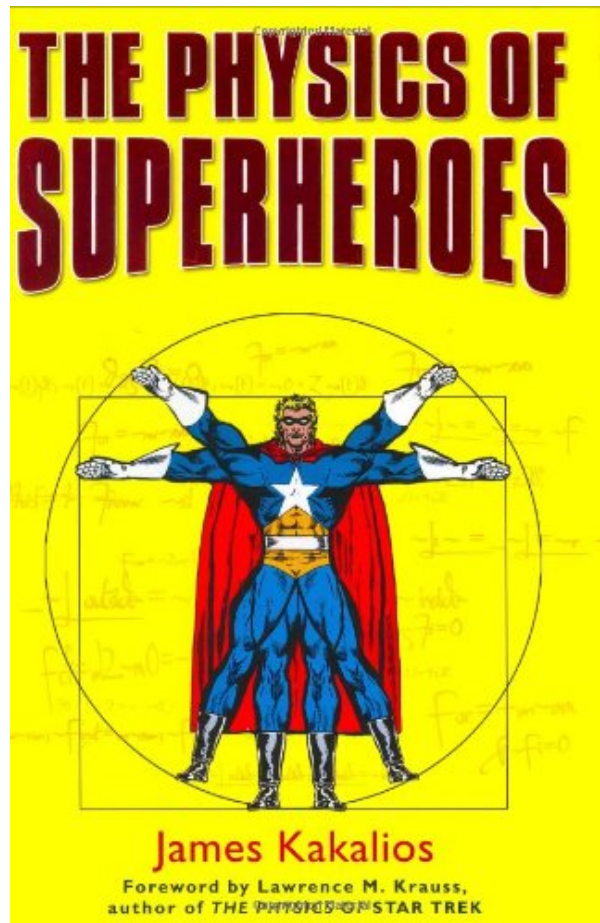


# THE PHYSICS OF SUPERHEROES BY JAMES KAKALIOS



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# THE PHYSICS OF SUPERHEROES



**James Kakalios**

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Starred Review. This terrific book demonstrates a number of important points. First, a subject that everyone "knows" is difficult and boring can, in the hands of a master teacher, be both exciting and fun. Second, it's a myth that only people particularly adept at mathematics can understand and enjoy physics. Third, superhero comic books have socially redeeming qualities. By combining his love for physics with his love of comic books, University of Minnesota physicist Kakalios has written a book for the general reader covering all of the basic points in a first-level college physics course and is difficult to put down. Among many other things, Kakalios uses the basic laws of physics to "prove" that gravity must have been 15 times greater on Krypton than on Earth; that Spiderman's girlfriend, Gwen Stacy, died because his webbing stopped her too abruptly after she plunged from the George Washington Bridge; and that when the Flash runs, he's surrounded by a pocket of air that enables him to breathe. Kakalios draws on the Atom, Iron Man, X-Men, the Ant-Man and the Hulk, among many others, to cover topics as diverse as electromagnetism, quantum mechanics, string theory and thermodynamics. That all of this is accomplished with enough humor to make you laugh aloud is an added bonus. B&w illus.

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From the Back Cover

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-Gerard Jones, author of Men of Tomorrow: Geeks, Gangsters, and the Birth of the Comic Book

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If superheroes stepped off the comic book page or silver screen and into reality, could they actually work their wonders in a world constrained by the laws of physics? How strong would Superman have to be to "leap tall buildings in a single bound"? Could Storm of the X-Men possibly control the weather? And how many cheeseburgers would the Flash need to eat to be able to run at supersonic speeds?

Face front, True Believer, and wonder no more! Because in *The Physics of Superheroes* acclaimed university professor James Kakalios shows that comic book heroes and villains get their physics right more often than you think.

In this scintillating scientific survey of super powers you'll learn what the physics of forces and motion can reveal about Superman's strength and the true cause of the destruction of his home planet Krypton, what villains Magneto and Electro can teach us about the nature of electricity—and finally get the definitive answer about whether it was the Green Goblin or Spider-Man's webbing that killed the Wall Crawler's girlfriend Gwen Stacy in that fateful plunge from the George Washington Bridge!

Along the way, *The Physics of Superheroes* explores everything from energy, to thermodynamics, to quantum mechanics, to solid state physics, and Kakalios relates the physics in comic books to such real-world applications as automobile airbags, microwave ovens, and transistors. You'll also see how comic books have often been ahead of science in explaining recent topics in quantum mechanics (with Kitty Pryde of the X-Men) and string theory (with the Crisis on Infinite Earths).

This is the book you need to read if you ever wondered how the Invisible Woman of the Fantastic Four can see when she turns transparent, if the Atom could travel on an electron through a phone line, or if electromagnetic theory can explain how Professor X reads minds. Fun, provocative, and packed with more superheroes and superpowers than an Avengers-Justice League crossover, *The Physics of Superheroes* will make both comic-book fans and physicists exclaim, "Excelsior!"

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By Brandon Hart

Loved it! He gets bogged down a little in the science stuff but comes out of it with simple but colorful examples of EXACTLY what is happening when a superhero performs their feat of power. He keeps based in reality though so if you expect him to tell you how Superman flies without wings then you're out of luck.

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I have searched for a book that would help me and my ten year old son learn about physics - and thisbook certainly hits the mark. The author's lighthearted approach and his linking the principles to comic book heroes makes for a brilliant read. Okay, so my boy might not get the whole picture first off - neither does his dad - but the examples Kakalios uses help to visualise the concepts and therefore help you to understand sometimes quite difficult concepts. Also makes for some interesting "mind-bending" musings 'twixt boy and man :)

Well Done Mr. Kakalios!

By the way - all the equations are in an appendix for those that need 'em

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