

Physics in comic books

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The two highest-grossing movies of 2018 to date, *Avengers: Infinity War* and *Black Panther*, feature main characters who have advanced degrees in physics. Iron Man's creator Tony Stark earned his master's degree in physics at MIT. T'Challa, who later becomes Black Panther, earned his physics PhD at Oxford University. Although Stark and T'Challa did not pursue physics as a career, Bruce Banner, whose alter ego is fellow Avenger the Hulk, was a physicist when he acquired his body-expanding superpower.

In the early 1960s when Marvel's Stan Lee and Larry Lieber created the Hulk and Iron Man, the Soviet Union, the US, and the other nuclear powers were detonating new nuclear weapons to test them. Both Stark and Banner are weapons designers, a natural choice of métier, given the prominent role physicists played in the Manhattan Project and its successors.

Lee created Black Panther in 1966. It's possible he gave T'Challa a physics PhD to prepare him for leading Wakanda, a technologically advanced African country whose wealth depends in part on vibranium. Physics would be useful for understanding the fictional metallic element and its applications.

But I suspect another motivation. T'Challa's physics education is revealed in a flashback to the character's physical and mental accomplishments as a young man. What better way to convince readers of a character's high intelligence than to have him be a physicist! Lee bestowed a PhD in biophysics on the leader of the X-Men, Charles Xavier, for possibly the same reason.

It's nice to see physicists depicted as superheroes rather than as mad scientists or brilliant geeks. It's also nice to see filmmakers update characters with science in mind. In the original comic, Black Panther's young sister Shuri is a warrior. In the movie, director Ryan Coogler and cowriter Joe Robert Cole turned

her into a technology genius—a female, African, teenage equivalent of James Bond's quartermaster, Q.

Just as interesting and welcome, I think, are comics in which

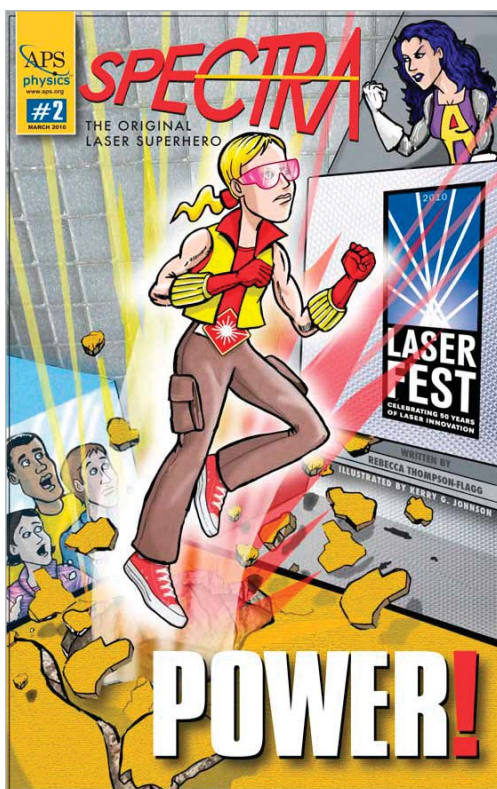
physics appears not just in a character's backstory but as an integral part of the plot. That's the case for *RASL* (2008–12). Written and illustrated by Jeff Smith, the story involves two

unification theories. One was expounded by Albert Einstein in "New possibility for a unified field theory of gravitation and electricity," which appeared in 1928 in the *Proceedings of the Prussian Academy of Sciences*. The comic's main character, a researcher named Robert Johnson, uses the theory to build the T-suit, a personal teleportation device for battlefield use. When he tests the T-suit on himself, he is indeed teleported—but not between locations in the world he lives in. Rather, he finds himself in a parallel version of his world. The second unification theory is one that Nikola Tesla was working on when he died. In *RASL*, theory helps Johnson realize what the T-suit does.

Fundamental physics is also integral to *FBP: Federal Bureau of Physics* (2014–16). Written by Simon Oliver and illustrated by Robbi Rodriguez, the comic relates how special agent Adam Hardy and his FBP colleagues intervene with quantum technologies to maintain the increasingly fragile integrity of spacetime.

Why might Smith, Oliver, and others have made physics central to their stories? Physics seeks to account for the natural world on all its scales, from quarks to cosmos. Perturbing

nature by adjusting its physics offers a broad and limitless canvas for ideas. The writers were inspired by physics, I suspect, because physics itself is inspiring. PT



Spectra: The Original Laser Superhero is a physics-inspired, educational comic for middle schoolers. Written by Rebecca C. Thompson for the American Physical Society, the comic is available for free at www.physicscentral.com/explore/comics.