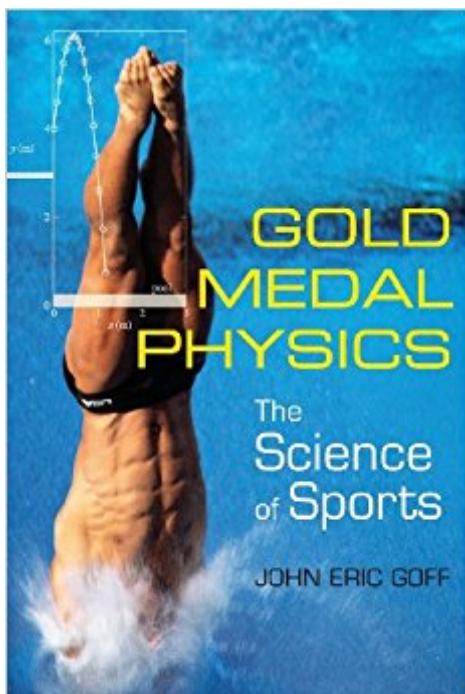


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# Gold Medal Physics: The Science Of Sports



## Synopsis

Nothing is quite as thrilling as watching superior athletes do the seemingly impossible. From Doug Flutie's "Hail Mary" pass to Lance Armstrong's record-breaking climb of Alp d'Huez to David Beckham's astounding ability to bend a soccer kick, we marvel and wonder, "How did they do that?" Well, physics professor John Eric Goff has the answers. This tour of the wide world of sports uses some of the most exhilarating feats in recent athletic history to make basic physics concepts accessible and fun. Goff discusses the science behind American football, soccer, cycling, skating, diving, long jumping, and a host of other competitive sports. Using elite athletes such as Greg Louganis and Bob Beamon as starting points, he explains in clear, lively language the basic physical properties involved in amazing and everyday athletic endeavors. Accompanied by illustrations and mathematical equations, each chapter builds on knowledge imparted in earlier portions of the book to provide a firm understanding of the concepts involved. Fun, witty, and imbued throughout with admiration for the simple beauty of physics, *Gold Medal Physics* is sure to inspire readers to think differently about the next sporting event they watch.

## Book Information

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## Customer Reviews

Mathematically minded readers who've always wondered how great athletes do what they do will learn from Goff how to view the world of sports through the lens of physics. Goff, a sports enthusiast and Lynchburg College physics professor, is more than comfortable analyzing a variety of feats of physical prowess, such as a spectacular play in the final seconds of a legendary 1982 Stanford-Berkeley college football game. After analyzing that play with its five lateral passes, Goff

moves on to stage 16 of Lance Armstrong's 2004 Tour de France win, and a record-breaking long jump by Bob Beamon at the 1968 Summer Olympics. While the discussion of the mechanics of angular momentum using the spins and rotations of ice skating and diving (Katarina Witt and Greg Louganis, respectively) will be familiar to nearly anyone who's read a physics textbook, Goff surprises with chapters on how to bend it like Beckham, win at sumo wrestling, and use statistics and probability to predict college football outcomes. Sports fans with a knowledge of geometry and trigonometry will enjoy Goff's cheerful revisiting of memorable athletic events. 70 illus. (Jan.)

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--This text refers to the Hardcover edition.

"Goff... is more than comfortable analyzing a variety of feats of physical prowess... Sports fans with a knowledge of geometry and trigonometry will enjoy Goff's cheerful revisiting of memorable athletic events." (Publishers Weekly)"A lively, pleasant read with plenty of real physics and mathematical details." (American Journal of Physics)"Sports libraries will find this engrossing." (Midwest Book Review)"How athletes, Olympian and otherwise, perform some of their most amazing physical feats." (Science News)

This book combines a geek's love of science with a jock's love of sports and explains the physics behind some of the greatest moments in sports: the Doug Flutie hail Mary pass vs. Miami, the last play of the 1982 Cal-Stanford game, etc. Good stuff!

What an interesting way to look at sports. I'm surely not a physicist, but this book was a clear and easy read to understand the relationship between physics and sports. I can see that the writer really has a passion for both. I'd recommend this book to anyone who has a love for all sports and wants to see "how its done".

Puts a difficult subject into perspective by applying directly to real life sports, an area that most people are familiar with. Well done.

Instead of repeating other reviewers, I focus mostly on unmentioned content, with a concentration on soccer. Vectors are used to decompose the motion of balls into their horizontal and vertical components. The angular motion of an ice skater is analyzed. The effects of air drag on a bicyclist are figured. There is a helpful bibliography of other books and articles which deal with the physics of

sports. A standard soccer ball, kicked at a speed of 5 m/sec, experiences a drag force of about 0.25 newtons. (Fig 7.7, p. 130). The corresponding numbers for higher speeds are: (7.5 m/sec, 0.5 newtons), (12 m/sec, 0.75 newtons), (15 m/sec, 1.0 newton), (18 m/sec, 1.5 newtons), and (20 m/sec, 2.0 newtons). A sphere having a rough surface, as it flies through the air, experiences less air drag than a smooth sphere of the same diameter and flying speed. This owes to the fact that the rough sphere creates a boundary layer that is decoupled from the main air stream that is resisting the movement of the ball. In effect, the boundary layer serves as a "lubricant" relative to the air stream. At a speed of over 7 m/sec, the hypothetical perfectly-smooth-surface soccer ball would experience a drag force of about twice that of its actual non-smooth-surface counterpart. Baseballs, soccer balls, golf balls, etc., all experience the same phenomenon to varying degrees. The interaction of the rotating boundary layer with the airflow around the kicked soccer ball is not symmetrical. This creates a force (the Magnus force) that causes the ball to curve as it flies through the air. The player who is kicking a penalty shot tries to get the ball to curve to an impact point in the corner of the net. When successfully executed, the goalie has almost no chance of stopping the kicked soccer ball.

Very fast, receive it next day. These are so great! Whenever I leave when running and sweating. These awesome, i am an expert " Suit for this price . She says it is very beauiful.

Gold Medal Physics: The Science of Sports pairs discussions of some amazing recent feats in athletic history with surveys of physics and science behind soccer, cycling, football, skating, jumping and other competitive sports. The result is an explanation that explains physics in clear layman's terms and offers illustrations and math equations to build upon and reinforce sports knowledge. Perfect for sports and science libraries alike.

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