

Can You Bend it Like Beckham?

THE PHYSICS OF SOCCER: USING MATH AND SCIENCE TO IMPROVE YOUR GAME

by Deji Badiru, published by iUniverse, 1663 Liberty Drive, Bloomington, IN 47403, www.iuniverse.com,

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Soccer, or football, as it is better known in this part of the world, is one of the most popular team games. The kind of frenzy and passion a game of soccer generates is only to be seen to be believed. Dangerous and tragic stampedes have occurred at many games.

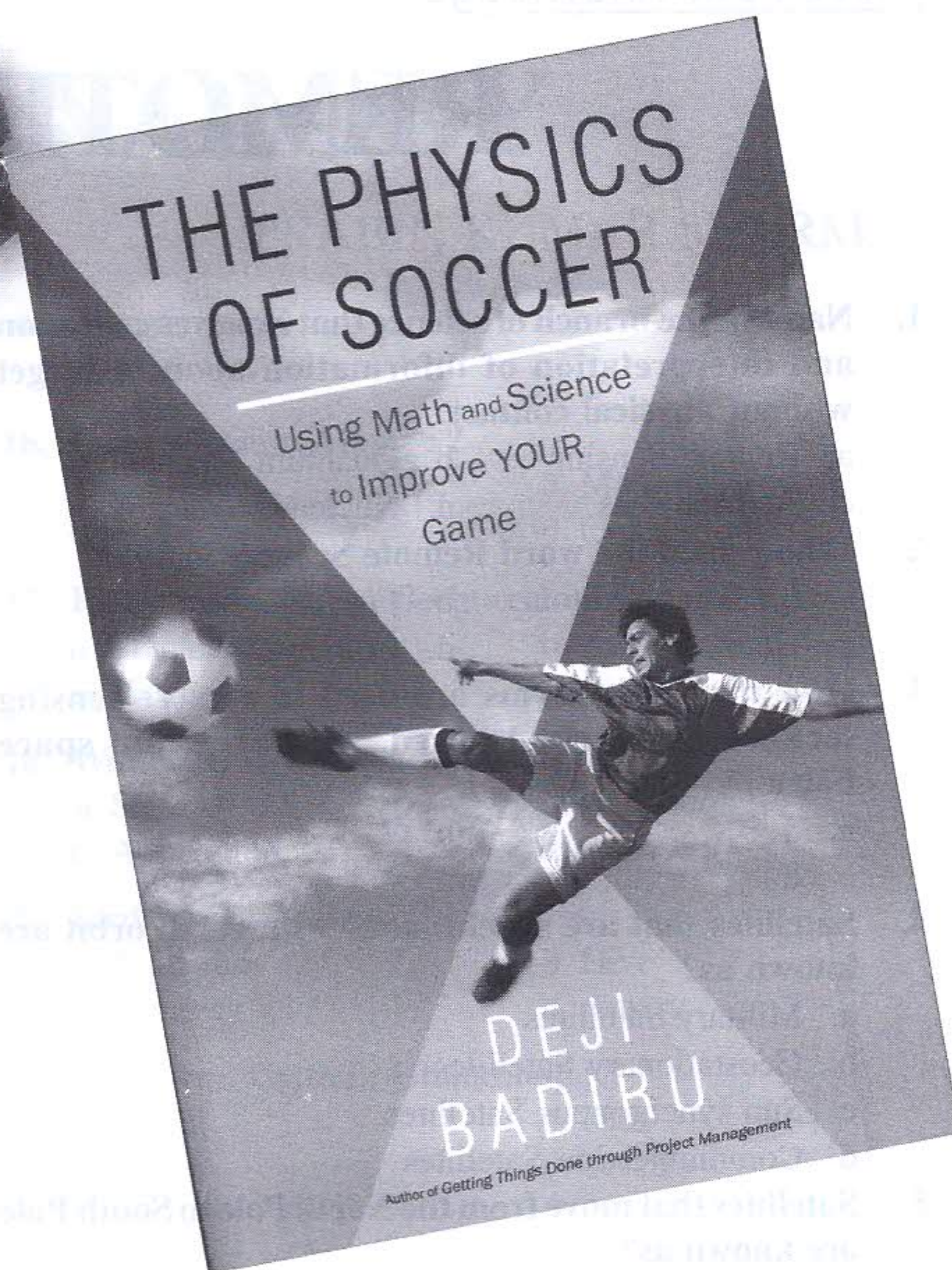
There are innumerable theories on how soccer came into being. While according to some, it started in Brazil when a few children came across a bucket of soft rubber and turned it into a ball shape, others point to Roman soldiers who used the heads of enemies in a game with simple goal posts. While some credit the Mayan and Aztec Indians for originating soccer others give credit to China where soccer is said to have been played with leather balls in celebration of the emperor's birthday.

But whatever the origin, there is no getting away from the fact that the game is immensely popular the world over. And as you delve deeper into the game you find much of the soccer skills firmly rooted in scientific principles. That is the interface that Deji Badiru talks about in his book *The Physics of Soccer: Using Math and Science to Improve Your Game*. The credentials of the author? Well, he has been a soccer player for over forty years, soccer coach for eight years and has spent over thirty years as an engineering educator.

Soccer is a game played with a lot of passion, stamina and speed. Did you know that in a ninety-minute game of soccer, on an average, a player has ball possession for only about three minutes? So, skill, speed and technique are of paramount importance. And, according to the author, a close study of scientific principles will help players perfect their techniques.

For instance, a football player needs to be able to accelerate from zero to top speed to beat an opponent to the ball. The ball can come from any direction and so the ability to react quickly and take advantage of the ball requires proper starting motion and good acceleration. This component needs to be built into training programmes.

The soccer player also uses various parts of his body and also accessories to his advantage. For instance, the tip of the soccer shoe is often used as a wedge to separate the ball from the ground thereby lifting the ball up for skilful ball handling. Then, a skilful player can also use his outstretched leg and thigh as a ramp to roll the ball down onto his foot much like happens with an inclined plane.



Since soccer is a game of motion, a close look at the laws and principles of motion is also a must. Taking just one instance, according to the laws of motion, the longer a force acts on an object, the faster the object will move. This principle of force duration is applied in reverse when a soccer player receives a fast pass. The ball is brought under control more effectively by elongating the duration of the stopping force. This is accomplished by drawing the foot back as the ball makes contact with the foot.

And then there is the legendary banana kick perfected by David Beckham. He is reputed to be able to bend the ball around a wall of defenders and also trick the goalkeeper. The banana kick is the outcome of both skill and science. The ball is not kicked along the line of the center but rather across the ball with a twisting flick of the foot. The result is a spin on the ball that sends the ball on a trajectory often difficult for opponents to guess. Of course, delve deeper and you will find a whole lot of complex physics too involved such as gravity, drag and Magnus force.

Apart from developing his own stamina and speed, an intelligent player also studies the motion tendencies of opponents to find out their stability attributes such as center of gravity and so on.

The author also details several scientific training practices that enable players to develop speed, judge the power they should impart to their kick to give the ball just the right force and height, and so on. And of course, the seventeen steps to supersonic soccer using Brian Peacock's doctrine.

An interesting book for those who have an interest in soccer and also a slight hang of science, which is necessary to be able to understand the various math and science principles the author introduces in the book.

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