interpolation theory. His explanations of modal and nodal bases, differentiation and mass matrices, and the organization of global operators are clear and highly reproducible. The emphasis on algorithmic detail makes the text particularly attractive for students building their first high-order PDE solvers or trying to understand standard components of software packages.

In short, Giraldo's book succeeds by teaching the essentials of Galerkin methods extremely well, without straying into unnecessary abstraction. For instructors seeking a concise and implementation-friendly text, and for students wanting a single reference, this book is well worth serious consideration.

LILIA KRIVODONOVA
University of Waterloo

The Football: The Amazing Mathematics of the World's Most Watched Object. *By Étienne Ghys.* Princeton University Press, Princeton, NJ, 2025. $19.99. xi+136 pp., hardcover. ISBN 978-0691263120.

A quick and quirky read, *The Football: The Amazing Mathematics of the World's Most Watched Object,* by Étienne Ghys, introduces mathematical audiences to the development of the shape of a football (in the U.S., "soccer ball"), or football audiences to the development of mathematics. It mixes history, physics, art, mathematics, and sports in an entertaining look at the geometric foundations of a football.

Ghys first gives a brief overview of the ball itself with carefully selected reference images. Instead of simply delivering facts about the ball, Ghys helps the reader reason about the isometric projections and how this mathematical tool applies to football design. For example, on Page 3, we see a display of a soccer ball with one of the black hexagons centered toward us; with this display, we informally step through why there must be twelve total black panels on the ball. Even a reader without formal mathematical training can appreciate the style of thinking that allows us to see a simple two-dimensional image and construct a three-dimensional object in our minds. At this point, Ghys gives us a delightful and half-serious diatribe on how even professional organizations will depict incorrect or even impossible soccer balls. These antiexamples of soccer balls also sneakily introduce additional tidbits of polygonal geometry.

Next, we dive into the storied history of Platonic solids, along with commentary on the design process of new footballs. After concisely explaining the geometric intuition behind the iconic *Telstar* ball, the bulk of the book is a tour through some other famous balls focusing on those featured in famous matches. Ghys carefully constructs a theoretical framework to study how to construct Platonic solids, along with an extension to Archimedean solids through *truncation,* a concept that is both simple but not included in typical geometry curricula. In particular, the commentary on the *Brazuca* ball is both beautiful and an elegant display of reasoning with an Archimedean touch. Even geometers may learn something new about the practical applications of this ancient math.

Finally, in the last two chapters, we take a look at the physics of football flight, connections to origami, and some more formal concepts of geometry. Though the mathematics is not beyond grade school level, this part of the book is more abstract. Instead of relying primarily on figures as before, these chapters are written in prose that sometimes sits awkwardly between formal mathematical writing and the previous breezy tone. However, the discussion on drag introduces a very technical subject with the typical grace and enthusiasm of the book, which is how Ghys shines as a mathematics communicator.

In *The Football,* Ghys has something for everyone, no matter your interest in sports or mathematics. Most of the work is structured around figures, with the text punctuating the carefully selected images, which makes for a visually interesting and easy read. Although the book can be somewhat chaotic (you can skip around without difficulty), this work is a fun reminder of the ancient and neat mathematics that encompasses all areas of modern life.

DEVAVRAT VIVEK DABKE
Graham Capital Management

Copyright © by SIAM. Unauthorized reproduction of this article is prohibited.