CityU 香港城市大學 City University of Hong Kong

Hong Kong Institute for Advanced Study

HKIAS Distinguished Lecture Series

Soccer Balls: Their History, Geometries, and Aerodynamics

Professor Étienne Ghys
French National Centre for Scientific Research

Date: 30 October 2024 (Wednesday)

Time: 4:30pm-5:30pm (Light refreshment will be served from 4pm-4:30pm)

Venue: HKIAS Lecture Theatre,
LG/F, Academic Exchange Building, City University of Hong Kong

Abstract While we may prefer kicking soccer balls to scrutinizing their seams, it's intriguing to discover that not all soccer balls are the same. Since 1970, each World Cup has introduced a new ball design—still roughly spherical, of course, but with remarkable innovations. We will examine the structure of some of these balls that we have all seen, without ever looking at them closely. We'll delve into the geometry and design of soccer balls: How can we craft an object that closely approximates a perfect sphere? And even if two balls share the same shape, why do they follow different flight paths? This will also bring us to the "drag crisis phenomenon," a concept well-known in fluid dynamics - and among goalkeepers. A blend of geometry, a touch of physics, and a dash of history!

Biography Étienne Ghys is a mathematician, Emeritus research director at the CNRS. He contributed to the creation and development of the mathematics laboratory at the ENS de Lyon. He is the Permanent Secretary of the Academy of Sciences since 2019. His scientific work focuses on geometry, topology and dynamic systems. For example, we owe him results allowing a better understanding of the topology of the famous Lorenz butterfly, a paradigm of chaos theory. He has actively helped to expand the diffusion of mathematics in France. The researcher's various mediums, audiences, and subjects include general audience books, films for teachers to use in classrooms, audiobooks for visually impaired persons, managements of the Year of Mathematics, a website, conferences, and media appearances. A fervent defender of using images, in 2009 he created the online version of the review Images des mathématiques (Images of Mathematics), whose goal is to present recent advances in mathematical research, in addition to its historical, cultural, and sociological aspects, with over ten million views! His diffusion activities have already been recognized by a number of awards, and have prompted the international mathematical community to enhance and improve scientific mediation activities. "I strive to share the pleasure of mathematics with the largest possible audience," recaps the internationally recognized mathematician, who was awarded the 1991 CNRS Silver Medal, the 2015 Clay award for dissemination of mathematical knowledge, the 2022 CNRS mediation Medal.

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