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FUTURE MISSISSIPPI

Surprising adaptations of the
EARLIEST PENGUINS

AMERICAN Scientist

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World Cup redesigns
change how the ball
performs.



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DEPARTMENTS

130 From the Editors

131 Letters to the Editors

134 Podcast Preview

136 Spotlight

Three paths to fusion power • Small predator, big strategy • Strengthening AI guardrails • Briefings

144 Sightings

Roughing it

146 Perspective

Balls in the air
John Eric Goff

152 Technologue

The peril beneath the glow
Ainissa Ramirez

156 Science and Engineering Values

Building in our value(s)
Robert T. Pennock

SCIENTISTS' NIGHTSTAND

184 Book Reviews

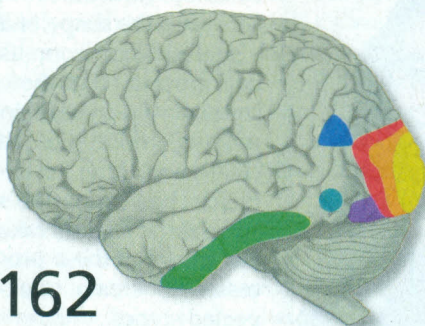
Frameworks of the mind • A galactic art salon • What lies beneath

FROM SIGMA XI

189 Sigma Xi Today

The future of science • Leadership nominations • Faces of GIAR: Prakash Prabhu • Faces of GIAR: Reena Debray • Jasmine Shah named Deputy Executive Director • IFoRE '26 • Monie A. Ferst Award winner

FEATURE ARTICLES



162

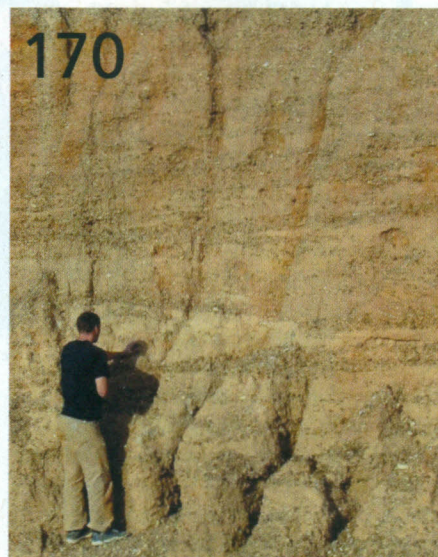
162 The Mind and the Mirror

René Magritte's art achieves its surreal effects by manipulating the neurobiology underlying human visual perception.
Russell D. Hamer

170 The Ancient Mississippi River's Return

Current flooding along preglacial tributaries foreshadows broader changes as North America rebounds from the most recent ice age.

Roy Van Arsdale, Youngsang Kwon, Randel Cox, and David Lumsden



170

176 Diversity from Isolation

Fossils of early penguin species reveal the myriad paths these birds took from the sky to the sea, and from temperate New Zealand to the frozen Antarctic.
Daniel T. Ksepka



176

THE COVER



The commemorative footballs created for each new World Cup are more than eye-catching visual redesigns; their surfaces can comprise different numbers of panels, new textural elements, and seams that vary in depth, width, and length. In "Balls in the Air" (pages 146–151), physicist John Eric Goff describes how these changes can significantly alter the flight of balls during Fédération Internationale de Football Association (FIFA) tournaments. Within a 20-year historical context of remodeled and recolored balls that includes the 2026 Trionda, Goff describes how such surface factors affect drag—and how that football-slowing force can suddenly change at certain speeds. When such changes happen at free-kick speeds, they can cause substantial headaches for goalkeepers. (Cover image by Ben Kirshner.)