

AMERICAN SCIENTIST

CONTENIDO

VOLUME 103, No. 5, SEPTEMBER-OCTOBER 2015

DEPARTMENTS

306 **From the Editor.**

307 **Letters to the Editors**

310 **Spotlight.**

New sites on the trail of early humans • Hydraulic fracturing and water quality • A guide to atmospheric pollutants • Briefings.

317 **Sightings.**

Particles crash again.

318 **Engineering.**

An incubator for cooperation across the disciplines.

Henry Petroski.

322 **Arts Lab.**

Visualizing biological networks as mandalas.

Caryn Babaian.

326 **Computing Science.**

Programs and probability.

Brian Hayes.

SCIENTISTS' NIGHTSTAND

360 **Book Reviews**

Mathematics, symmetry, and art • The meaning of touch • Dragonflies up close.

FROM SIGMA Xi

365 **Sigma Xi Today.**

Kansas City meeting • *American Scientist* awards • Evan Ferguson Award winner • Science communication ships • McGovern Award winner.

FEATURE ARTICLES

330 The Most Powerful Movements in Biology.

From jellyfish stingers to mantis shrimp appendages, it takes more than muscle to move extremely fast.

S. N. Patek.

338 The Past and Future Space Suit.

New designs and materials promise suits with greater functionality.

David P. Cadogan.

248 Do Humans Possess a Second Sense of Hearing?

Mammalian ears, including our own, still rely on features from our early vertebrate ancestors.

Neil Todd.

356 A Protective Cloak Against Earthquakes and Storms.

It's not invisibility, but cloaking technology may be able to shield objects from other types of damaging waves.

Gregory J. Gbur.

THE COVER

Oil rigs, such as this one in the North Sea off the Scottish coast, are often subjected to pummeling ocean waves. Other powerful waves, such as seismic and magnetic ones, can also cause great damage. Researchers are exploring concepts from cloaking technology that might be used to protect structures or objects from such waves. Cloaking, in theory, usually means making something invisible by redirecting light waves around it so the observer sees light that doesn't appear to have interacted with anything. It's possible that such a technology may never be feasible. But a Gregory J. Gbur explains in "A Protective Cloak Against Earthquakes and Storms" (pages 356-359), by changing the density of water or ground, ocean or seismic waves can be made to change speed, and thus direction, divesting them around an object and "cloaking" it from damage, if not from sight. (Photograph by Gandee Vasan/Getty Images.)