# SCIENTIFIC AMERICAN

## **CONTENIDO**

## VOLUME 304 No. 2 FEBRUARY 2011

### **FEATURES**

### **HEALTH**

### 40 How to Fix the Obesity Crisis.

Although science has revealed a lot about metabolic processes that influence our weight, the key to success may lie elsewhere. *David H. Freedman*.

#### **SPACE**

#### 48 Citizen Satellites.

Even a small research group can now afford to send its own science experiments into Earth orbit.

Alex Soojung-Kim Pang and Bob Twiggs.

#### **SUSTAINABILITY**

### 54 The Blue Food Revolution.

New fish farms out at sea, and cleaner operations along the shore, could provide the world with a rich supply of much needed protein. *Sarah Simpson*.

### **COGNITIVE PSYCHOLOGY**

### 62 How Language Shapes Thought.

The languages we speak affect our perceptions of the world. *Lera Boroditsky*.

### **BIOLOGY**

#### The Inner Life of the Genome.

The way our genes are arrayed and move in the 3-D space of the nucleus turns out to profoundly influence how they function, in both health and disease.

Tom Misteli.

#### **ECOLOGY**

### 74 A Fried to Aliens.

Ecologist Mark Davis thinks his colleagues exaggerate threats from invasive species.

Interview by Brendan Borrell.

#### **ASTROPHYSICS**

### 78 X-ray Vision.

Thanks to amazing mirrors, NASA's NuSTAR telescope, scheduled to launch in 2012, will peer past clouds of dust to reveal hidden phenomena in

the cosmos.

Fiona Harrison and Charles J. Hailey.

#### **NEUROPROSTHETICS**

### 80 Mind Out of Body.

Brain-wave control of machines will allow the wheel-chair-bound to walk and portends a future of mind melds and thought downloads.

Miguel A. L. Nicolelis.

#### HISTORY OF SCIENCE

#### **Jefferson's Moose.**

Thomas Jefferson waged a second revolution, fighting the image created by European naturalists of a degenerate America. *Lee Dugatkin*.

#### **DEPARTAMENTS**

### **6** From the Editor

#### 8 Letters

## 14 Science Agenda.

States should eliminate voluntary exemptions from childhood vaccines. *The Editors*.

#### 16 Forum.

The bright side of science gridlock in Washington. *Francesca Grifo*.

### 20 Advances.

Vitamin D throwdown. Gut worms. Fat cats, A bird-watcher in Baghdad. What we can't smell. Death by plastic. A magnet for flu. Winter babies. Mystery of the talking particles. Math and popularity.

### The Science of Health.

Popular demand for an unproved surgery for MS shows the growing power of social media.

Katie Moisse.

#### 38 TechnoFiles.

The success of Google's Android software doesn't prove that open is better. *David Pogue*.

#### 88 Recommended.

Bringing prehistory to life. The deadly choices of the antivaccine movement.

Kate Wong.

### 89 Skeptic.

Houdini's skeptical advice.

Michael Shermer.

# 90 Anti Gravity.

Can't science and art get along? *Steve Mirsky*.

# 91 50, 100 & 150 Years Ago.

# 92 Graphics Science.

Your brain in love. *Mark Fischetti*.

## On the Cover

If current trends continue, an excess of weight will surpass smoking as the primary cause of preventable deaths in the U.S. Health experts, however, often overlook the best near-term strategy for stopping the obesity epidemic behavior-modification methods that have been shown to change people's eating and exercise habits.

Illustration by Bryan Crhistie.