# SCIENTIFIC AMERICAN

## **CONTENIDO**

## VOLUME 305 No. 4 OCTOBER 2011

## **FEATURES**

### **ASTROPHYSICS**

## The Dark Side of the Milky Way.

Dark matter remains mysterious but is nonetheless helping to explain odd things about the galaxy we call home. *Leo Blitz*.

## SPECIAL YEAR OF CHEMISTRY CELEBRATION

### **46 ATOM POWER**

# 48 10 Unsolved Mysteries.

The International Year of Chemistry reminds us that many outstanding questions in science and technology are, at their core, issues for chemists to solve.

Philip Ball

## 54 The Scent of Your Thoughts.

Like other animals, humans unwittingly communicate by exchanging chemical signals.

Deborah Blum.

#### **GEOLOGY**

## 58 Afghanistan's Buried Riches.

Geologists working in the war-torn country say newfound deposits there could fulfill the world's desire for rare-earth and other critical minerals. *Sarah Simpson*.

### **MEDICINE**

## 60 A New Ally against Cancer.

The FDA recently okayed the first therapeutic vaccine against cancer, and other drugs that enlist the immune system to fight tumors are under study. *Eric von Hofe*.

## **FORENSICS**

### 72 How Skulls Speak.

As striking photographs show, the braincases of males and females differ in predictable ways.

Anna Kuchment.

### **PHYSICS**

### Waiting for the Higgs.

Even as the last protons spin through the most successful particle collider in

history, physicists hope to conjure one final triumph. *Tim Folger*.

### **PALEONTOLOGY**

## The Dinosaur Baron of Transylvania.

A maverick aristocrat's ideas about dinosaur evolution turn out to have been decades ahead of their time.

Gareth Dyke.

### **BIOLOGY**

# 84 Actuary of the Cell.

Nobel Prize winner Elizabeth H. Blackburn explains why she thinks she can assess a person's health by examining tiny stretches of DNA at the tips of chromosomes.

Interview by Thea Singer.

### **DEPARTAMENTS**

### **6** From the Editor

### 8 Letters

## 12 Science Agenda.

It is time to end invasive medical research in chimps.

The Editors.

# Forum.

Toxins are all around us and shouldn't be.

Patricia Hunt.

### 16 Advances.

Born scientists. Safer water. A high-tech sports "glove." Butterfly genetics. Tales of a cancer warrior. Archimedes' lost writings. Building a superfast Internet.

#### The Science of Health.

Immigrants in the U. S. are often healthier than those born here. Why is that?

Laura Blue.

### 34 TechnoFiles.

Praise for unsung trends in consumer electronics.

David Pogue.

### 88 Recommended.

Seductive orchids. The magic of reality.

Kate Wong.

### 90 Skeptic.

Be very wary of claims that we live in more violent times.

Michael Shermer.

# 92 Anti Gravity.

Riding the wave to birdbraindom. *Steve Mirsky*.

# 94 50, 100 & 150 Years Ago.

# 100 Graphics Science.

Disturbing trends in data hacking. *Mark Fischetti*.

## On the Cover

It's warped! The Milky Way galaxy, often depicted as a flat disk containing a spiral pattern of stars and gas, actually has a notable twist. The warp baffled astronomers until they realized that dark matter might form clumps and wrest the galactic disk into this shape. Dark matter also makes sense of other puzzles of our cosmic neighborhood.

Image by Kenn Brown, Mondolithic Studios.