

28 COSMOLOGY Follow the Bouncing Universe

By Martin Bojowald

Our universe may have started not with a big bang but with a big bounce—an implosion that triggered an explosion, all driven by exotic quantum-gravitational effects.

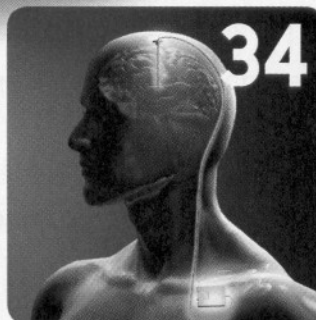


Image by Kenn Brown

34 NEUROSCIENCE Lighting Up the Brain

By Gero Miesenböck

A clever combination of optics and genetics allows neuroscientists to map—and even control—brain circuits with unprecedented precision.



44 GEOLOGY Birth of an Ocean

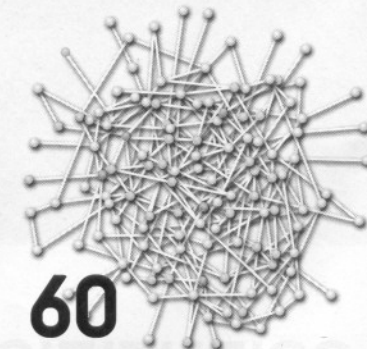
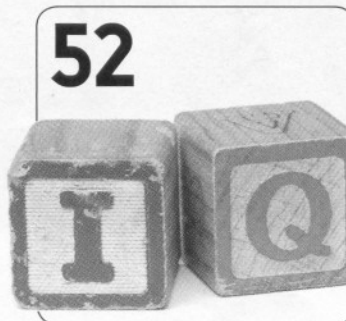
Story and photographs by Eitan Haddock

Through this dazzling photographic essay, visit an ocean that is forming in one of the hottest, most inhospitable corners of the globe.

52 COGNITION The Search for Intelligence

By Carl Zimmer

Scientists hunting among our genes for the factors that shape intelligence are finding them to be more elusive than expected.



60 INFORMATION TECHNOLOGY Web Science Emerges

By Nigel Shadbolt and Tim Berners-Lee

Studying the Web will reveal better ways to exploit information, prevent identity theft, revolutionize industry and manage our ever growing online lives.



ON THE COVER

One theory of quantum gravity suggests that the cosmos oscillates in size without ever reaching the infinite density associated with the big bang.
Image by Kenn Brown, Mondolithic Studios.

LIFE SCIENCE

66 Barcode of Life

By Mark Y. Stoeckle and
Paul D. N. Hebert

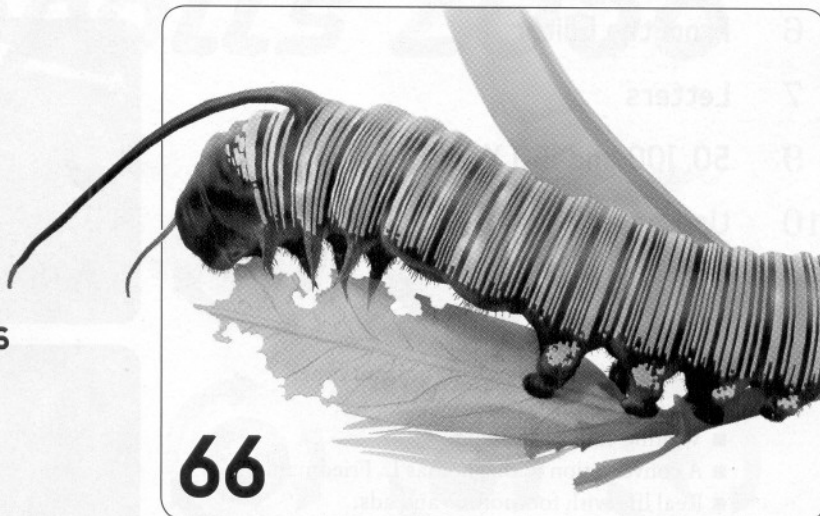
Inspired by commercial barcodes, DNA tags could provide a quick, inexpensive way to identify species.

INNOVATIONS

72 With Open-Source Arms

By Sam Boykin

An online community of engineers, designers and innovators—one of whom lost an arm in Iraq—is collaborating to make better prostheses for amputees.

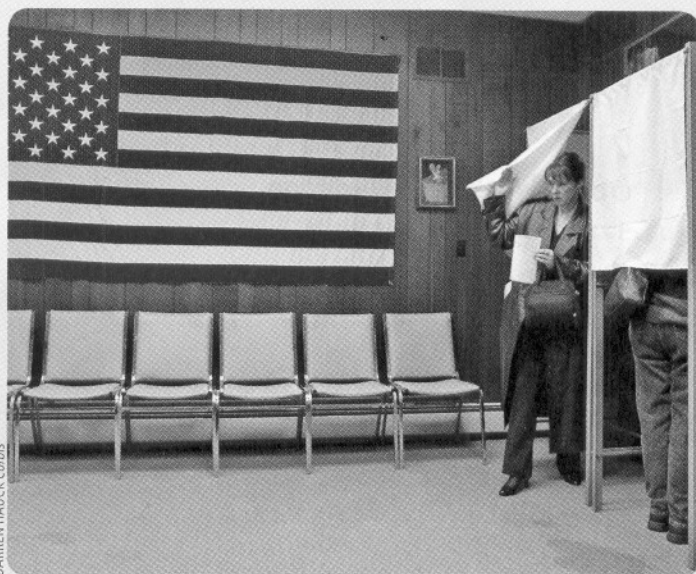


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Chemists have devised less expensive ways to tap the energy potential of this ubiquitous element.



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We discuss high-tech attempts to battle improvised explosive devices (IEDs), and journalist John Horgan talks about the possibility of eliminating war.



News

How the Seeds of the First Stars Formed
Simulations reveal that the cosmic dark ages ended when protostars coalesced from primordial clouds of hydrogen gas.



Video

Instant Egghead
From dark matter to synthetic biology, SciAm editors show how to explain complicated concepts simply, using the everyday stuff on their desks.



News

Could a Pill Replace Exercise?
A drug improves physical endurance in mice, but don't throw away your treadmill quite yet.

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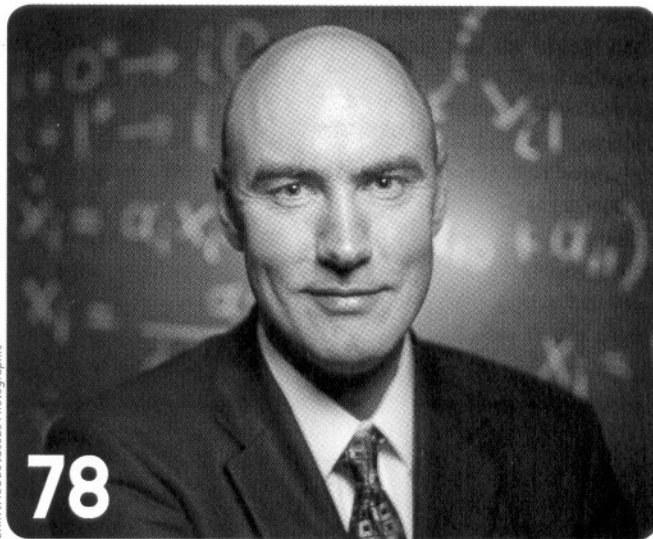
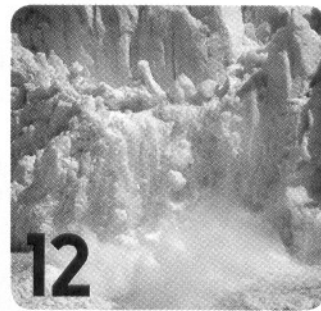
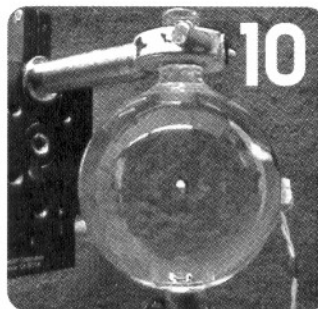
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ERIK JACOBS/JACOBS PHOTOGRAPHIC

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