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Quantum Theory

NEUROSCIENCE  
Breaking the  
Brain Barrier

CLIMATE SCIENCE  
A Battle Plan  
for Superstorms

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## Tiny Engines of Evolution

Millions of years ago  
phytoplankton powered  
the explosion of life



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JUNE 2013



# The New York Academy of Sciences Neuroscience Conferences

**JUNE**  
2013

June 19 - 20, 2013 New York, NY  
Progressive Multifocal  
Leukoencephalopathy

[www.nyas.org/PML2013](http://www.nyas.org/PML2013)

**SEPT**  
2013

September 18, 2013 Aspen, CO  
Bionic Skeletons and  
Beyond: Emerging  
Technologies for  
Spinal Cord Injury

[www.nyas.org/Bionic](http://www.nyas.org/Bionic)

**SEPT**  
2013

September 18 - 20, 2013 Aspen, CO  
Accelerating Translational  
Neurotechnology:  
Fourth Annual Aspen  
Brain Forum

[www.nyas.org/Neurotechnology](http://www.nyas.org/Neurotechnology)

**OCT**  
2013

October 24, 2013 New York, NY  
Seventh Annual  
Parkinson's Disease  
Therapeutics Conference

[www.nyas.org/MJFF7](http://www.nyas.org/MJFF7)

**NOV**  
2013

November 6 - 7, 2013 New York, NY  
Alzheimer's Disease  
Summit: The Path  
to 2025

[www.nyas.org/Pathto2025](http://www.nyas.org/Pathto2025)

**DEC**  
2013

December 10, 2013 New York, NY  
A Truce in the  
 $\beta$ AP-tist/Tau-ist War?  
A Unified Understanding  
of Alzheimer's Disease

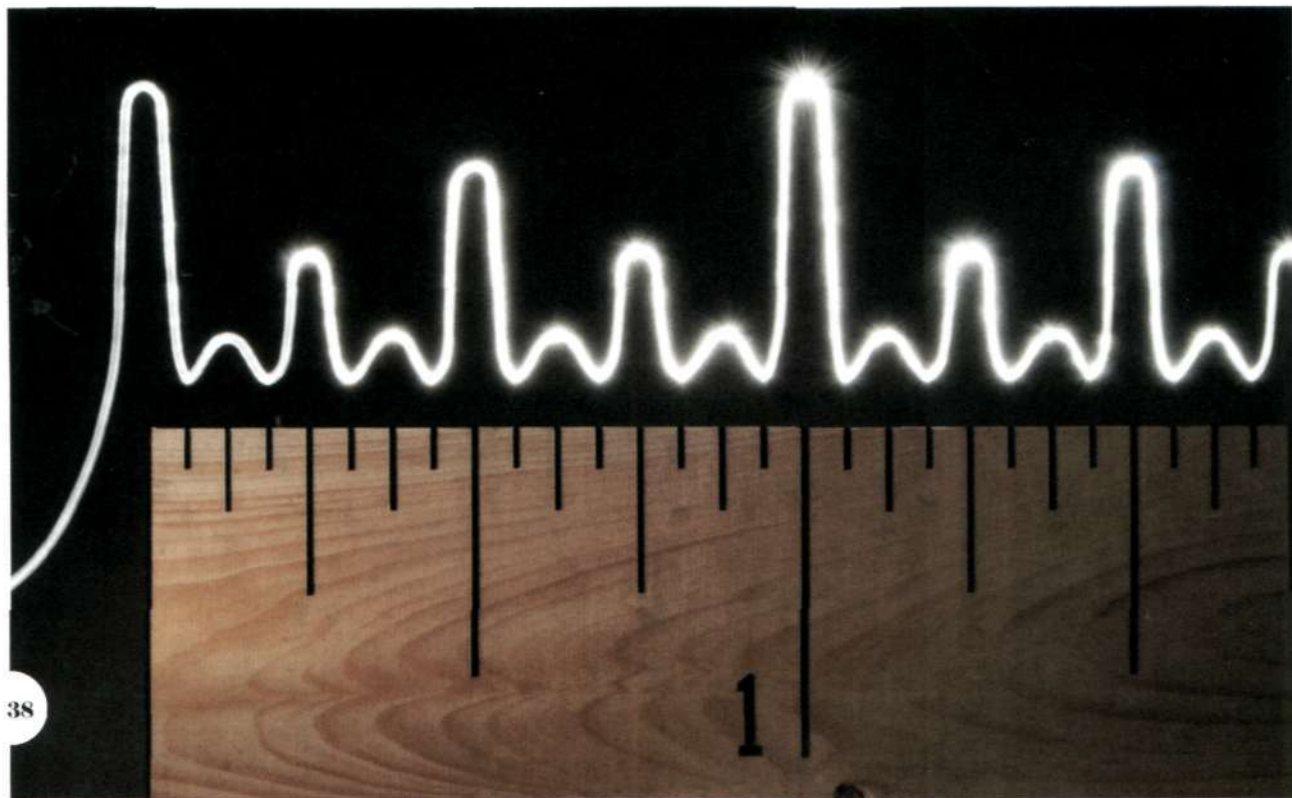
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The New York Academy of Sciences  
7 World Trade Center 250 Greenwich St. 40th Fl. New York, NY 10007  
212.298.8640 [www.nyas.org](http://www.nyas.org)



Increases in the abundance and nutrient content of minuscule aquatic plants known as phytoplankton probably helped to power a dramatic diversification of marine animals that started a quarter of a billion years ago. Photography by Chris Ross, Getty Images (background); Steve Gschmeissner, Science Source (phytoplankton).



## FEATURES

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#### 32 **Tiny Plants That Once Ruled the Seas**

Why did animal life in the ocean explode with diversity about 250 million years ago? The driving force may have been the rise of phytoplankton.

*By Ronald Martin and Antonietta Quigg*

### PHYSICS

#### 38 **Quantum Weirdness? It's All in Your Mind**

A novel version of quantum theory sweeps aside the bizarre paradoxes of the subatomic world.

*By Hans Christian von Baeyer*

### NEUROSCIENCE

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A new understanding of the blood-brain barrier as a living, mutable organ may revolutionize the treatment of cancer, Alzheimer's and other diseases. *By Jeneen Interlandi*

### CLIMATE SCIENCE

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The entire U.S. East Coast is vulnerable to ocean surges like the one that inundated New York City during Hurricane Sandy. Protective measures will be costly and disruptive. *By Mark Fischetti*

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The discovery of element 117 filled the last remaining gap in the periodic table. Just as the table is finally being completed, it may be losing its explanatory power.

*By Eric Scerri*

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Trees tell a tale of changing climate.

*By Marissa Fessenden*

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Stereotypes can become self-fulfilling prophecies, hindering performance in school, work and athletics. Researchers have found new ways to reverse and prevent this effect. *By Ed Yong*

### INFORMATION TECHNOLOGY

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The Web needs to radically change the way it handles information, says Markus Hofmann, head of Bell Labs Research. *Interview by Larry Greenemeier*