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The 2003 Scientific American 50 List of Winners

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RESEARCH

RESEARCH LEADER OF THE YEAR

Roderick MacKinnon

Professor of molecular neurobiology and biophysics, Rockefeller University; investigator, Howard Hughes Medical Institute
Elucidated the structure and function of ion channels, particularly the potassium ion channel.

AEROSPACE

Larry Cornman and Robert Sharman

Project scientists, research applications program, National Center for Atmospheric Research, Boulder, Colo.
Discovered an algorithm that allows aircraft radar to better detect turbulence.

AGRICULTURE

Joanne Chory

Professor of plant molecular and cellular biology, Salk Institute for Biological Studies, San Diego; investigator, Howard Hughes Medical Institute
Pinpointed a gene that may allow shaded plants to grow more productively.

AUTOMOTIVE

Khalil Amine

Group leader, Battery Technology Development, Argonne National Laboratory, Argonne, Ill.
Made superior lithium-based batteries for hybrid vehicles and medical devices.

CHEMICALS AND MATERIALS

Thomas Szyperski

Associate professor of chemistry and biochemistry, State University of New York, Buffalo
Adapted nuclear magnetic resonance techniques to map a protein's atomic structure in hours, not days.

COMMUNICATIONS

David E. Culler

Professor of computer science, [University of California, Berkeley](http://www.eecs.berkeley.edu); former director of the Berkeley laboratory of Intel Research
Field-tested networks of sensors for military and environmental applications.

COMPUTING

Armando Fox

Assistant professor of computer science, Stanford University
Showed how software could protect networks from disastrous crashes in individual servers.

DEFENSE

Frank X. Hursey

President, Z-Medica, Newington, Conn.
Developed a mineral sponge that stops soldiers' blood loss.

ECONOMIC DEVELOPMENT

Richard Jefferson

Chair, Center for the Application of Molecular Biology to International Agriculture, Canberra, Australia

Helps innovators in the Third World develop biotechnologies.

ENERGY

James A. Dumesic

Professor of chemistry, University of Wisconsin-Madison

Pioneered economical catalysts for turning biomass into hydrogen fuel.

ENVIRONMENT

Daniel Pauly

Fisheries scientist, University of British Columbia

Advances the case for setting up marine reserves so that fisheries can make a comeback.

IMAGING

Philip E. Batson

Researcher, department of physical sciences, IBM Thomas J. Watson Research Center, Yorktown Heights, N.Y.

Demonstrated an electron microscope that can see objects smaller than an atom.

MANUFACTURING

David Grier

Professor of physics, New York University

Built arrays of optical tweezers that may eventually power micromachines.

MEDICAL PHYSIOLOGY

Roel Nusse

Professor of developmental biology, Stanford University School of Medicine; investigator, Howard Hughes Medical Institute

Purified a molecule that may help restore blood cells destroyed through chemotherapy.

MEDICAL TREATMENT

Bahige M. Baroudy and Chris Hitchcock

Baroudy, director, department of antiviral therapy, Schering-Plough Research Institute, Kenilworth, N.J., and Hitchcock, senior director of exploratory development, Pfizer Global Research and Development, Sandwich, England

Created drugs that blocked a receptor to prevent HIV from entering cells.

NANOTECHNOLOGY AND MOLECULAR ELECTRONICS

Charles Lieber

Professor of chemistry, Harvard University

Made nanowires, switches, sensors and lasers; fabricated electronic components and devices with features only billionths of a meter across.

PRIVACY AND SECURITY

Rakesh Agrawal

Fellow, IBM Almaden Research Center, San Jose, Calif.

Devised methods to preserve the privacy of information in large databases.

PUBLIC HEALTH AND EPIDEMIOLOGY

The Malaria Parasite/Mosquito Genome Projects

Unraveled the genetic information of the parasite that causes malaria and of the mosquito that spreads it.

BUSINESS

BUSINESS LEADER OF THE YEAR

Toyota Motor Corporation

Toyota City, Japan

Commercialized affordable hybrid cars.

AEROSPACE

Burt Rutan

President, Scaled Composites, Mojave, Calif.

Designed a reusable suborbital passenger spacecraft.

AGRICULTURE

Fernando de Castro Reinach

General partner, Votorantim Ventures, Saç Paulo, Brazil

Started biotechnology companies that are trying to improve Brazilian crops.

AUTOMOTIVE

DaimlerChrysler

Stuttgart, Germany

Pushed fuel-cell cars toward the commercial marketplace.

CHEMICALS AND MATERIALS

Novozymes

Bagsvaerd, Denmark

Launched a program to reduce by an order of magnitude the cost of enzymes for making ethanol.

COMMUNICATIONS

Steven Jobs

CEO, Apple Computer, Cupertino, Calif.

Started an online music service that serves as a model for the rest of the record industry.

COMPUTING

Intel Corporation

Santa Clara, Calif.

Crafted possible solutions for Internet bottlenecks and constructed chip sets that make wireless networking easier.

DEFENSE

Cepheid

Sunnyvale, Calif.

Enabled some post offices to track anthrax through use of biodetectors.

ENERGY

Changing World Technologies

West Hempstead, N.Y.

Devised a method for turning solid waste into oil.

ENVIRONMENT

Zeca Corporation and Los Alamos National Laboratory

Calgary, Canada, and Los Alamos, N.M.

Commercialized a process to convert coal into hydrogen fuel.

MANUFACTURING

Fluidigm

South San Francisco, Calif.

Built microscopic channels, pumps and valves that will create the fluidic equivalent of microchips.

MEDICAL TREATMENT

Genentech

South San Francisco, Calif.

Developed the first commercial drug that stops blood vessel growth in tumors.

NANOTECHNOLOGY AND MOLECULAR ELECTRONICS

Nanosys

Palo Alto, Calif.

Funded the development of nanotechnology.

PRIVACY AND SECURITY

Anonymizer

San Diego, Calif.

Protected the anonymity of those offering tips about corporate malfeasance.

PUBLIC HEALTH AND EPIDEMIOLOGY

Merck Research Laboratories

West Point, Pa.

Created a vaccine that may help eliminate cervical cancer.

ROBOTICS

iROBOT

Burlington, Mass.

Introduced the first truly mass-market household robot.

POLICY

POLICY LEADER OF THE YEAR

Gro Harlem Brundtland

Former secretary general, World Health Organization

Coordinated a rapid global response to stem the SARS outbreaks.

AEROSPACE

Harold W. Gehman, Jr.

Chair, Columbia Accident Investigation Board

Distinguished himself for a hard-nosed approach to investigating the Columbia accident.

AGRICULTURE

Paul R. Polak

President, International Development Enterprises, Lakewood, Colo.

Encouraged local markets to improve access to water for Third World farmers.

AUTOMOTIVE

Ken Livingstone

Mayor, London, England

Implemented tariffs to regulate city traffic.

CHEMICALS AND MATERIALS

Anthony J. Muscat

Associate professor of chemical and environmental engineering, University of Arizona

Introduced environmentally friendly chipmaking technologies.

COMMUNICATIONS

Edward Felten

Professor of computer science, Princeton University

Persistently criticized proposed digital TV standards.

COMPUTING

Henry Chesbrough

Visiting assistant professor, Institute of Management, Innovation and Organization, University of California, Berkeley

Advocated the abolition of the not-invented-here syndrome that afflicts many companies.

DEFENSE

Arthur K. Cebrowski

Director, Office of Force Transformation, U.S. Department of Defense

Articulated the "network-centric" approach to warfare implemented during the Iraq conflict.

ECONOMIC DEVELOPMENT

Frances J. Stewart

Professor of development economics, University of Oxford

Promoted anti-poverty campaigns to help quell armed conflicts in developing nations

ENERGY

Kurt Yeager

Chief executive officer, Electric Power Research Institute (EPRI), Palo Alto, Calif.

Lobbied for a major overhaul of the power industry long before the 2003 blackouts.

ENVIRONMENT

Andrew Balmford

Conservation scientist, University of Cambridge; co-founder, Cambridge Conservation Forum

Described how economic motives can justify preserving natural habitats.

MANUFACTURING

Heather White

Founder and executive director, Veritj, Amherst, Mass.

Campaigned to extricate migrant workers from virtual slavery.

MEDICAL TREATMENT

Anthony S. Fauci

Director, National Institute of Allergy and Infectious Diseases

Convinced the Bush administration to commit \$15 billion to combat AIDS in Africa and the Caribbean.

NANOTECHNOLOGY AND MOLECULAR ELECTRONICS

Phillip J. Bond

U.S. undersecretary of commerce for technology

Promoted nanotechnology effectively within the executive branch.

PRIVACY AND SECURITY

Joe Simitian and Steve Peace

Simitian, state assemblyman, (Palo Alto), and Peace, former state senator (San Diego County), California State Legislature

Sponsored law that requires issuing warnings when possible identity theft occurs.

PUBLIC HEALTH AND EPIDEMIOLOGY

Bill & Melinda Gates Foundation

Seattle, Wash.

Gave hundreds of millions of dollars to meet the challenges of global health.

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