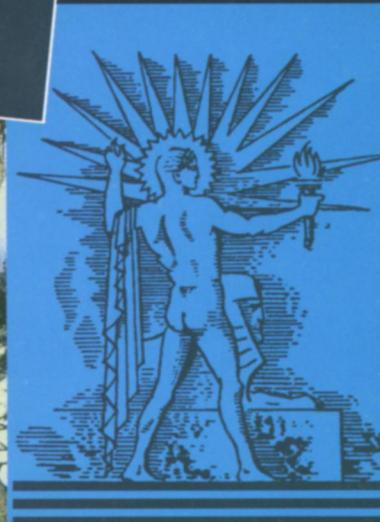
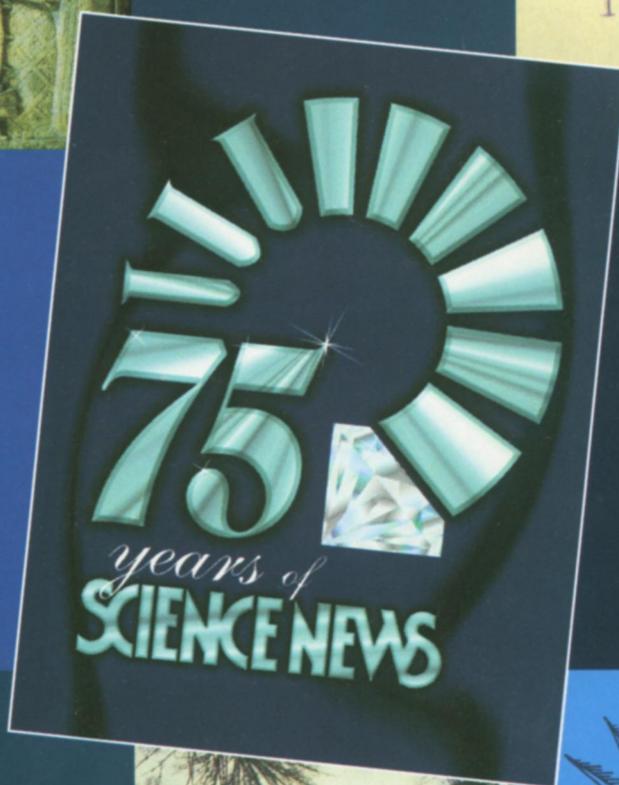
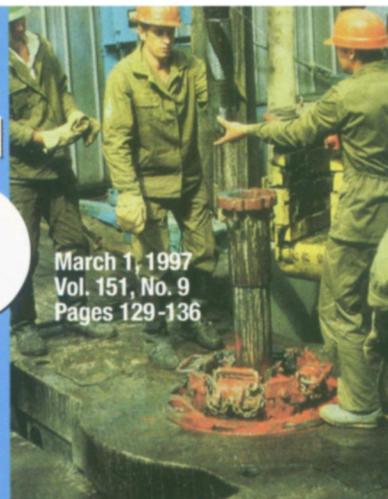


The Weekly Newsmagazine of Science

SCIENCE NEWS

March 1, 1997
Vol. 151, No. 9
Pages 129-136



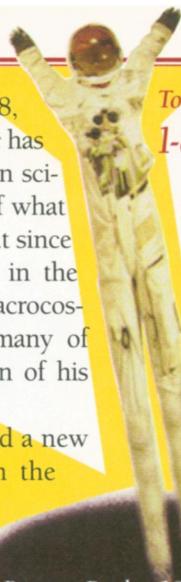


In the years since its publication in 1988, Stephen Hawking's *A Brief History of Time* has established itself as a landmark volume in scientific writing. The book was on the cutting edge of what was then known about the nature of the universe, but since that time there have been extraordinary advances in the technology of observing both the micro- and the macrocosmic worlds. These observations have confirmed many of Hawking's theoretical predictions in the first edition of his book.

For this expanded edition, Hawking has prepared a new introduction, written an entirely new chapter on the fascinating subject of wormholes and time travel, and updated the original chapters to include his most recent research and other new findings.

To heighten readers' understanding of complex concepts that they may have found difficult to grasp the first time around, this edition is enhanced throughout by more than 240 color illustrations, including satellite images, photographs made possible by spectacular technological advances such as the Hubble Space Telescope, and computer-generated images of three- and four-dimensional realities, all of which brings to the reader the tantalizing secrets at the heart of time and space.

— from Bantam Books



Bantam Books, 1996, 248 pages
7 7/8" x 10", hardcover, \$37.50

To order by phone, call:

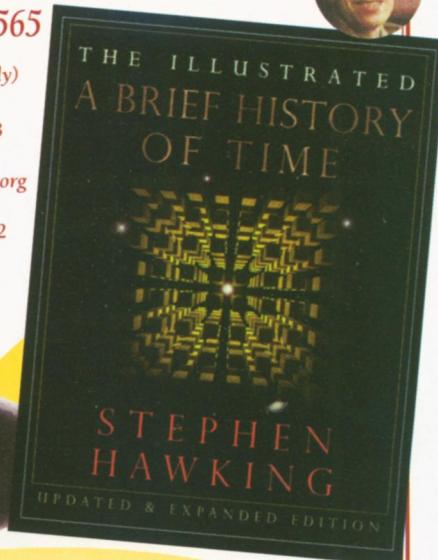
1-800-544-4565

(Visa or MasterCard Only)

In DC area:
202-331-9653

E-mail:
snbooks@scisvc.org

Fax:
202-785-1242



IllusBrHistH

Science News Books
1719 N Street, NW, Washington, DC 20036

Please send _____ copy(ies) of *The Illustrated A Brief History of Time*. I include a check payable to Science News Books for \$37.50 plus \$2.00 postage and handling (total \$39.50) for each copy. Domestic orders only.

Name _____
Address _____
City _____ State _____ Zip _____
Daytime phone _____

(used only for problems with order) RB2670

Chronicle of the World captures the full sweep of the incredible history of humanity as never before. It is a story of heroes and villains, of great battles and great empires, of appalling cruelties and sublime works of art—all told in a journalistic style. It's much like reading ancient newspapers.

Arranged in chronological order, the book summarizes the period from 3.5 million years B.C. to the present day. The period from 1945 to today is presented in an intriguing "you-are-there" format.

The book begins with a world timeline, which presents a brief overview of the course of human history under headings like politics, society, technology, and culture. At the beginning of the book, a 2-page spread may cover hundreds of thousands of years; by the end of the 18th century, coverage averages 2 years a spread. Short chronology entries list dates of important events, such as deaths, productions of works of art, inventions, etc.

— from Dorling Kindersley

Dorling Kindersley, 1996
1,175 pages, 9 1/2" x 11 3/4"
hardcover, \$59.95

To order by phone, call:
1-800-544-4565
(Visa or MasterCard Only)

In DC area: 202-331-9653
E-mail: snbooks@scisvc.org
Fax: 202-785-1242

Chronicle of the World



The ultimate record of world history

Science News Books, 1719 N Street, NW, Washington, DC 20036 ChronWorldH
Please send me _____ copy(ies) of *Chronicle of the World*. I include a check payable to Science News Books for \$59.95 plus \$2.00 postage and handling for each book (total \$61.95). Domestic orders only.

Name _____
Address _____
City _____ State _____ Zip _____
Daytime Phone _____

(used only for problems with order)

RB2669



Definitive Feynman

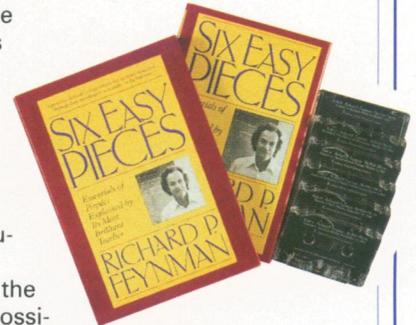
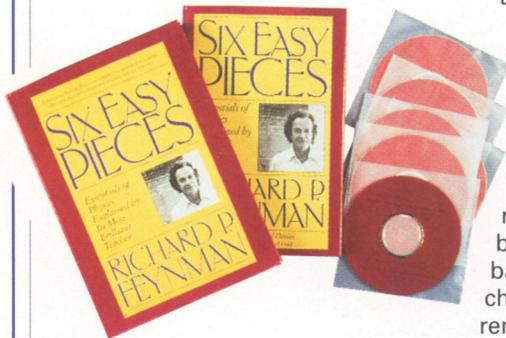
Actual recordings of Richard Feynman in the classroom

SIX EASY PIECES is a publishing first. Richard Feynman, one of the purest theoretical thinkers of all time, was also an unusually gifted teacher. His lectures were famous for breathtaking originality and the inspired use of clever examples and stories. This package consists of six CDs or cassette

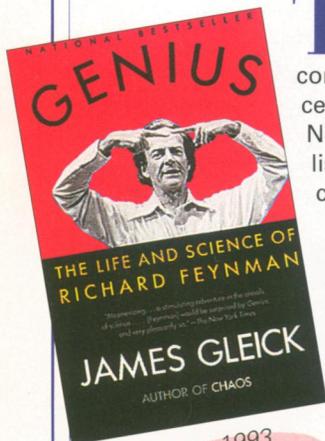
tapes, each featuring Feynman delivering a lecture from the famous course that resulted in his landmark book, *Lectures on Physics*. Nobel Laureate Feynman gave these lectures only once, to a group of Caltech undergraduates in 1961 and 1962.

The accompanying book grew out of the need to bring to as wide an audience as possible a substantial yet non-technical physics primer based on the science of Richard Feynman. We have chosen the six easiest chapters from *Lectures on Physics* (originally published in 1963), which remains his most famous publication.

— from Addison-Wesley



Addison-Wesley, 1995, 6 CDs or 6 cassettes, \$59.95/CD or \$49.95/tape; Book, 146 pages, 6½" x 9½", hardcover



Vintage, 1993,
531 pages, 5¼" x 8"
paperback, \$14.00

To his colleagues, Richard Feynman was not so much a genius as he was a full-blown magician: someone who "does things that nobody else could do and that seem completely unexpected." The path he cleared for 20th-century physics led from the making of the atomic bomb to a Nobel Prize. At the same time, the ebullient Feynman established a reputation as an eccentric showman, a master safe cracker and bongo player, and a wizard of seduction.

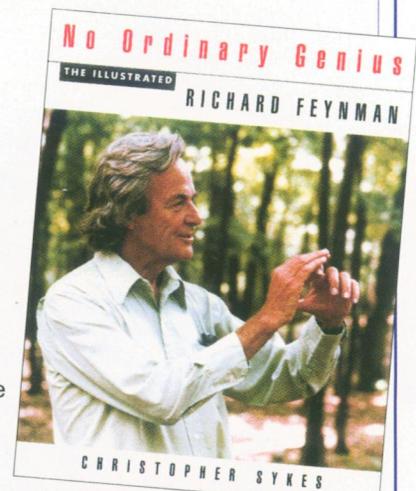
Now James Gleick, author of the bestselling *Chaos*, unravels the dense skein of Feynman's thought as well as the paradoxes of his character in **Genius**—a biography of outstanding lucidity and compassion that was nominated for a National Book Award.

— from Vintage

This intimate, moving, and funny book — **No Ordinary Genius** — traces Feynman's remarkable adventures inside and outside science in words and more than one hundred photographs, many of them supplied by his family and close

friends. The words are often his own or those of family, friends, and colleagues. Feynman's enthusiasm is wonderfully infectious. It shines forth in these photographs and in his tales — of learning science from his father and the *Encyclopædia Britannica*, working at Los Alamos on the first atomic bomb, unraveling the mysteries of liquid helium, or investigating the causes of the Challenger space shuttle disaster.

— from W.W. Norton



W. W. Norton, 1994, 272 pages
8" x 10", paperback, \$19.95

Science News Books,
1719 N Street, NW, Washington, DC 20036

6 EasyPieceCD NoOrdGenius
6 EasyPiecesT Genius

Please send the item(s) marked below. I include a check payable to Science News Books for the price of the item(s) plus \$2.00 postage and handling for each item (maximum \$6.00 charge). Domestic orders only.

Six Easy Pieces CD, \$59.95 No Ordinary Genius, \$19.95
 Six Easy Pieces Tapes, \$49.95 Genius, \$14.00

Name _____

Address _____

City _____ State _____ Zip _____

Daytime Phone _____

(used only for problems with order)

RB2671

Order by phone for
faster service!

1-800-544-4565
(Visa or MasterCard only)

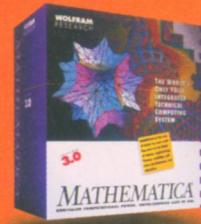
In DC area:
202-331-9653

E-mail:
snbooks@scisvc.org
Fax: 202-785-1242



years of
SCIENCE NEWS

“**Mathematica 3.0** is



...a real feat by Wolfram Research!”

Stunning!

—Oliver Johns
Professor of Theoretical Physics

A Million Users and Growing

Breathtaking Computational Power

$$\int \frac{1}{1-x^2} dx$$

$$\frac{1}{5} \sqrt{\frac{2}{5-\sqrt{3}}} \tan^{-1} \left(2 \sqrt{\frac{2}{5-\sqrt{3}}} \left(\frac{1}{4}(-1-\sqrt{3})+x \right) \right) +$$

$$\frac{1}{5} \sqrt{\frac{2}{5+\sqrt{3}}} \tan^{-1} \left(2 \sqrt{\frac{2}{5+\sqrt{3}}} \left(\frac{1}{4}(-1+\sqrt{3})+x \right) \right) +$$

$$\int \frac{1}{x} dx = \ln|x| + C$$

$$\int \frac{1}{x^2} dx = -\frac{1}{x} + C$$

$$\int \frac{1}{x^3} dx = -\frac{1}{2x^2} + C$$

$$\int \frac{1}{x^4} dx = -\frac{1}{3x^3} + C$$

$$\int \frac{1}{x^5} dx = -\frac{1}{4x^4} + C$$

$$\int \frac{1}{x^6} dx = -\frac{1}{5x^5} + C$$

$$\int \frac{1}{x^7} dx = -\frac{1}{6x^6} + C$$

$$\int \frac{1}{x^8} dx = -\frac{1}{7x^7} + C$$

$$\int \frac{1}{x^9} dx = -\frac{1}{8x^8} + C$$

$$\int \frac{1}{x^{10}} dx = -\frac{1}{9x^9} + C$$

New Generation Interactive Documents

- Structure Programmable
- Fully Active
- Optimized for Screen or Print

Table 1: Presentation Form

$$\alpha^2 - \beta \mid (\alpha - \beta) \mid (\alpha + \beta) \mid \alpha^2 - \beta^2$$

$$\alpha^2 - \beta \mid \alpha^2 - \beta^2 \mid (\alpha - \beta) \mid (\alpha^2 + \alpha \beta)$$

Table 1: Printout Form

$\alpha^2 - \beta$	$(\alpha - \beta)(\alpha + \beta)$	$\alpha^2 - \beta^2$
$\alpha^2 - \beta$	$\alpha^2 - \beta^2$	$(\alpha - \beta)(\alpha^2 + \alpha \beta)$

Totally Easy Interface

- Access the power of Mathematica just by pushing buttons
- Build up any interface you want
- Use Mathematica's uniquely powerful built-in programming language
- Use MathLink for easy interfaces to external programs

Expand[e]	BesselI[a, m]
Factor[e]	BesselJ[a, m]
Together[e]	BesselK[a, m]
Apart[e]	BesselY[a, m]
Cancel[e]	Erf[e]
	Gamma[m]
	Zeta[m]

WOLFRAM
RESEARCH

LEADERS IN ADVANCED COMPUTING

Find out more about Mathematica 3.0 for yourself at
<http://www.wolfram.com/stunning/scn>
or call 1-800-943-9618. Get the new edition of *The Mathematica Book* at your local bookstore.

AVAILABLE NOW for Microsoft Windows, Macintosh, and most Unix platforms. Order anytime on the web at <http://www.wolfram.com/stunning/scn>.

Mathematica is the world's only fully integrated system for technical computing, and is currently used by over a million technical professionals and students. Mathematica 3.0 is the result of five years of intensive R&D, and introduces major new concepts in computation and presentation, unprecedented ease of use, and a revolutionary symbolic document interface.



For a complete catalog of Wolfram Research products, contact: Wolfram Research, Inc.: <http://www.wolfram.com>; info@wolfram.com; +1-217-398-0700. Wolfram Research Europe Ltd.: <http://www.wolfram.co.uk>; info@wolfram.co.uk; +44-(0)1993-883400. Wolfram Research Asia Ltd.: <http://www.wolfram.com.jp>; info@wolfram.com.jp; +81-(0)3-5276-0506. © 1997 Wolfram Research, Inc. Mathematica is a registered trademark of Wolfram Research, Inc. and is not associated with Mathematica Policy Research, Inc. or MathTech, Inc.

THE MATHEMATICA BOOK is now available at bookstores everywhere.

We invite you to visit our web site at:
<http://www.sciencenews.org>

SCIENCE NEWS
 ONLINE

- Highlights from current and past issues
- Special coverage of SCIENCE NEWS' 75th anniversary
- MathLand and other features not in the magazine
- Full-text editions of selected articles from SCIENCE NEWS
- Book and gift listings
- Ability to search and contact SCIENCE NEWS ONLINE
- Bibliographic references for SCIENCE NEWS articles

THE LATEST IN WEATHER TECHNOLOGY NOW FITS INTO THREE LITTLE BOXES

Davis Instruments, the world leader in affordable, professional-quality weather stations, is proud to announce that it has expanded its weather line to include the

GroWeather system and a line of **EnviroMonitor** weather stations.

GroWeather™

Finally, an advanced weather station that helps you manage pest control, irrigation, and crop development. GroWeather calculates evapotranspiration, growing degree-days, and over 70 other values. Optional data logger/software stores, graphs, and tracks water usage, crop factors, pest onset, and more.



Energy EnviroMonitor™

Now you can evaluate and manage your energy needs more efficiently. Energy EnviroMonitor tracks heating, cooling, and wind-chill degree-days, solar radiation and wind run. Optional data logger/software can track fuel consumption and fuel delivery schedules.



Health EnviroMonitor™

It's never been easier to monitor the weather conditions that lead to sunburn, skin cancer, or hypothermia. Health EnviroMonitor displays heat stress, wind-chill, UV intensity and UV dosage, as well as solar radiation. Optional data logger/software estimates minutes to burn based on skin type and much more.



Call for a free catalog!

1-800-678-3669

Davis Instruments

3465 Diablo Ave., Hayward, CA 94545
 (510) 732-9229 • FAX (510) 732-9188 • sales@davisnet.com • www.davisnet.com • NC375U

In Preparation

1995-1996 SCIENCE NEWS ON CD-ROM

Searchable full text of news stories, features, notes, and letters from January 1995 through December 1996
 Windows® and Mac® compatible

Order now to reserve your copy at prepublication prices

— a savings of up to 20% —

\$47.50 per order; \$37.50 for SCIENCE NEWS subscribers
Plus \$4 handling and mailing fee

To order, call or fill out the form below and mail today!

Visa or MasterCard, order today at prepublication prices and

Save up to 20%

1-800-544-4565 / DC 202-331-9653

FAX: 1-202-785-1242

E-mail: sn_cdrom@scisvc.org

Web: <http://www.sciencenews.org>

Specifications for PCs 386SX processor or higher • Microsoft® Windows 3.1 or higher in an enhanced mode with virtual memory (and DOS 4.1 or higher) • 2X speed CD-ROM drive with Microsoft® MSCDEX ver. 2.0 or higher • 8 MB RAM with 6 MB of free hard disk space • VGA monitor as minimum. Super VGA monitor with 800 x 600 resolution is preferred
Specifications for Macintosh® System 7 or higher with Color Quickdraw is required • A Macintosh® compatible CD-ROM drive with Foreign File Access installed is required • 8 MB of RAM and 9.5 MB of hard disk space • A monitor with 256 color display and 640 x 480 or higher resolution
Specifications for UNIX® UNIX® workstations running SunOS 4.1.x (also under Open Windows™ 3.0), SGI® running IRIX® 5.0.x • ISO-9660 compatible CD-ROM drive

SCIENCE NEWS ON CD-ROM

1719 N Street, NW, Washington, DC 20036

SciNewsCDS
 SciNewsCDN

Please send me _____ copy(ies) of SCIENCE NEWS ON CD-ROM

- enclosed is \$51.50 — nonsubscriber's rate — for each order payable to SCIENCE NEWS (includes postage and handling)
- enclosed is \$41.50 — subscriber's rate — for each order payable to SCIENCE NEWS (includes postage and handling)
- bill my Visa or MasterCard \$51.50 nonsubscriber's rate
- \$41.50 subscriber's rate, for each order.

Name _____

Address _____

City _____ State _____ Zip _____

Credit card # _____

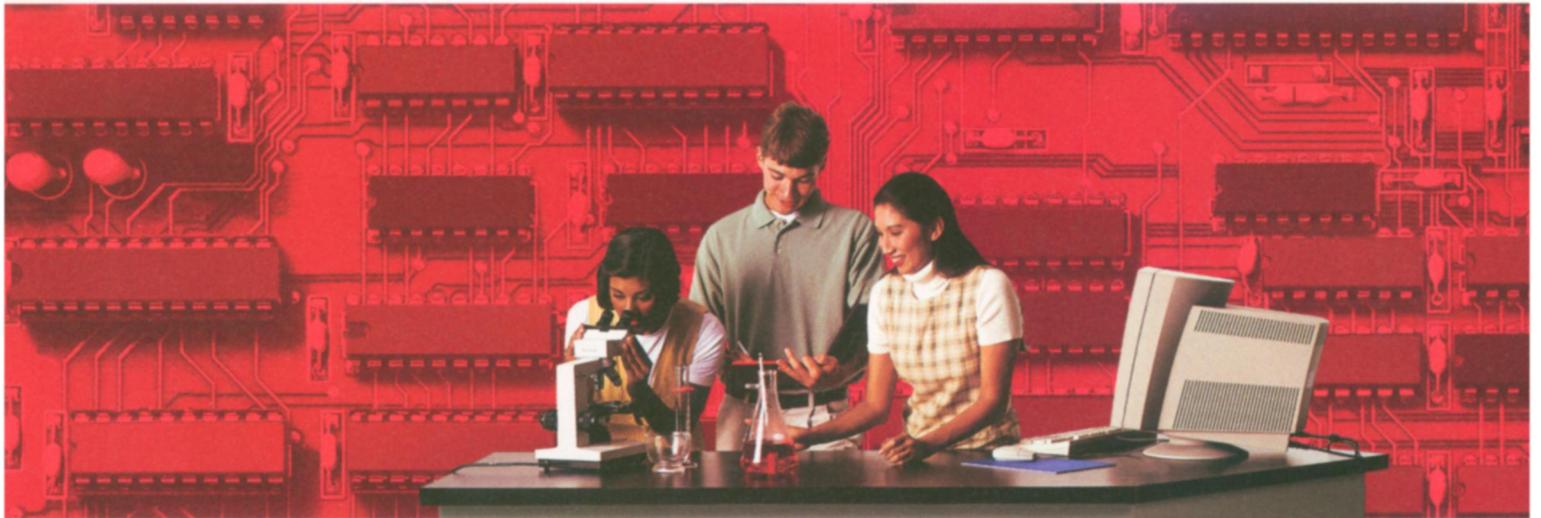
Signature _____ Exp. Date _____

Daytime phone _____

(used only for problems with order)

BB397CD

Microprocessors aren't the only brains we develop.



At Intel, we're devoted to the development of young minds as well as technology. Which is why we support valuable programs that help students develop math, science and engineering skills. The International Science and Engineering Fair builds tomorrow's leaders by giving students opportunities to find innovative solutions through applied science.

We are proud to be a major ISEF sponsor and we encourage students and educators from around the world to participate.

Science Comes Alive

IN THIS UNIQUE COLLECTION OF SCIENTIFIC, EDUCATIONAL AND OPTICAL PRODUCTS FOR EDUCATORS, STUDENTS AND INVENTORS.

FOCUS YOUR AUDIENCE'S ATTENTION WITH NEW RUSSIAN

LASER POINTER



Lightweight, measures only 5" long. Ideal for lecturers, educators, instructors, sales meetings and slide show presentations.

Project a brilliant red laser dot to focus attention to slide presentations, charts and sales meetings at distances up to 150 feet. Compact pen style class IIIa laser pointer is manufactured in Belarus at the IDK optical factory, this pen-style laser pointer is an excellent value. Features heavy-duty construction, baked enamel grey finish and pen clip-on switch. 6-8 hours continuous battery life, uses 2 "AAA" batteries (included). Solidly-built, yet weighs only 1.6 oz. Rated output: 5mW at 670nm.



DANGER
LASER LIGHT
*AVOID DIRECT EYE EXPOSURE
*DO NOT STARE INTO BEAM
*DO NOT POINT AT OTHER PEOPLE
CLASS IIIa LASER PRODUCT

Caution: Laser light, avoid direct eye exposure.

Our lowest price ever! **\$41.95** PE53,049

OPTICS • ASTRONOMY • BIOLOGY • CHEMISTRY • PHYSICS • MICROSCOPES MAGNETS • MOTORS • TELESCOPES • MAGNIFIERS • BINOCULARS • ROBOTS

7x50 US Navy Specification Military Binoculars.

Waterproof nitrogen-filled Fujinon binoculars are made in the USA. These are the same binoculars supplied to the US Navy for demanding sea duty. Brand new 7x50 binoculars meet or exceed military requirements for strength, performance and quality. For maximum light transmission and image brightness, all optical surfaces are coated with magnesium fluoride. The lenses and Bak-4 prisms are sealed with light alloy housings from which all air, moisture and contaminants have been purged by dry nitrogen. The eyepieces are O-ring sealed, 100% waterproof and impervious to temperature extremes from -20°C to +70°C, the 7x50 BIF series is designed for use anywhere on earth. For a more comfortable grip as well as added protection against impact, the binocular housing is covered with a strong, durable rubber coating. The eyepieces provide a focusing adjustment range of +4 diopters with 1-diopter calibration. Includes neck strap and lens cover. Field of View: 380 ft. Weight: 2.9 lbs. **PE53,459 \$229.00**

Fun And Intriguing! You'll Play For Hours With These Colorful Magnetic Magic Marbles.

Build a mountain or odd geometric patterns with these fascinating, high impact plastic marbles. Each marble has both a negative and positive pole. A challenge to your imagination. Fun for youngsters, adults too!

PE34,988 (Pkg. of 20) @ \$4.25 Ea.
15 Pkg. or more @ \$3.80 Ea.
(10 Pkg. or more) @ \$3.25 Ea.
PE37,623 (50 Marbles incl. bag) @ \$12.95 Ea.



Authentic WWII Memorabilia Tank Prism.

During W.W. II U.S. Army tanks carried panoramic periscopes so they could maneuver secured without exposing the driver in battle. The glass prism head for these periscopes was a favorite target for enemy snipers, thus each tank carried many spares. Packed in its original issue carton each prism is housed in an army brown metal frame which snapped into the periscope. Glass prism measures 54mm x 38mm x 146mm. Package weight 2 lbs. Original value to U.S. Gov't \$50.00 each in 1944. **PE53,462 \$19.95**

SCIENCE DISCOVERY!

Edmund 400X International Standard Full Size Student Microscope... Ideal For Every Classroom.

Open the hidden world to budding scientists to explore the fields of health, science and medicine with this professional instrument. It's the best quality and most economically priced microscope for the home/school budget. Features a large 14 1/2" tall heavy duty all metal frame built to International DIN Standards and weighs a hefty 7 lbs. 4 oz. Comes with three turret-mounted achromatic objectives, 40X - 100X - 400X and accepts all DIN objectives and eyepieces. Rack and pinion COARSE/FINE focusing allows for high power performance. Substage iris diaphragm provides precision light control for high contrast. Focus stop slide protection, adjustable inclination and spring clips included. This ES-400X student microscope, backed by a five year limited warranty, is highly recommended for your child's first microscope. Dust cover incl. **Reg \$145. PE52,453 \$120.00**
ES 400X Microscope with Plug-In Illuminator **PE53,087 \$189.00**
Wooden Storage Carrying Case **\$34.50 Value/PE53,234 \$29.95**

IT'S EASY TO ORDER WITH OUR FRIENDLY SERVICE

BY PHONE: 1-800-728-6999
Mon.-Fri. 8AM-8PM; Sat. 9AM-4PM (EST)
BY FAX: 1-609-547-3292
BY E-MAIL: scientifics@edscl.com
24 HOURS A DAY, 7 DAYS A WEEK
BY MAIL: enclose check or by credit card

Metric Triple Balance Ohaus Scale With Single Pan Balance.

The classic weighing instrument provides accurate weights year after year. Rugged construction, weigh anything - liquids, solids or live animals. Three tiered, notched beams (100-550, 10-100, 0-10 grams) have center readings, sliding poises, 610 gram capacity. Stainless 6" platform 18x6x6". **PE71,985 \$97.50**
Accessory Weight Set, expands scale to 2,610 capacity including 1-500 and 2-1000 gram wts. **PE41,766 \$26.00**

Deluxe Gyroscope Performs Gravity Defying Feats, Rotates 3 To 5 Minutes.

Demonstrates 'gyroscopic inertia' or rigidity in space as first recorded by Sir Isaac Newton in the 17th century. An object rotating about a fixed axis holds its position with respect to inertial space, no matter how the spinning object's support is moved about. Gyro-controlled guidance and navigation systems are used in ships, planes, missiles and space craft and used in mapping/survey work, oil drilling and motion-picture production. With laser gyros and advanced control mechanisms, gyroscopic principles promise to be an important part of tomorrow's technology. Space-age design gyroscope measures 3 1/4". **PE38,647 \$9.95**

Russian Mini Monocular Night Vision Scope... Ideal For Navigation, Camping, Security And Wildlife Observation.

• Palm-Sized Image Intensifier
• Built-in Illuminator for Total Darkness
• Focus-Free Objective, Adjustable Eyepiece Diopter

The newest in Russian night vision equipment, this pocket-sized scope is designed to fit into the palm of your hand. Compact, lightweight unit allows for easy extended use. This portable scope can be carried in your pocket, briefcase or purse. The built-in infrared illuminator lights up your field of view for totally dark viewing environments, but at wavelengths invisible to the human eye. Objective lens of the scope is pre-focused, only the eyepiece diopter requires adjustment for a clear, sharp image. **PE53,328 \$359.00**

Add Spectacular Color To Your Home With A Rainbow Light Display.

Our equilateral prism mounted in an attractive high tech positioning base catches the sunlight from your window sill and projects the ever-changing rainbow patterns over your walls, ceiling and floor. It's almost like being inside a multi-faceted diamond. Glass equilateral prism is 2" (50mm) long with 1" (25mm) faces. Black plastic mount is 3"x1 1/4"x1 1/4". **PE38,400 \$8.95**

Crash & Burn... A Chemistry Based Learning Lab.

Take a journey into basic chemical versus physical reactions. Experiments take you through thermal chemistry, glow-in-the-dark chemistry, precipitation, and coagulation. Stimulations of all 5 senses. Use **Crash & Burn Chemistry Kit** in the classroom, at home, in Science Fairs. Complete with chemicals, hardware and illustrated step-by-step booklet. For ages 10 years & up. **PE53,073 \$29.95**

ES Mighty Magnet Lifts Over 200 Pounds.

Go fishing with our Mighty Magnet. Fun to use around docks and bridges. A 'must' for a boat, it helps retrieve metal objects that fall overboard. You'll be amazed at what you pull up. Made with a bright orange Poly-Vinyl Chloride coating to resist corrosion and chipping. Many industrial and maintenance uses. Weighs 2 lbs., measures 4"x3 1/4"x3 1/4". **PE71,135 \$34.95**

Electric Diving Submarine Toy.

Our battery operated electric motor plastic toy submarine dives and resurfaces to the delight of young U-Boat commanders. 13" long and approximately 2" in diameter with diving depth adjustment or surface cruise mode. Requires 2 "AA" batteries (not included). **PE53,472 \$11.95**

Our Six Most Popular Science Toys That Teach.

Classic science demonstrations have amazed and intrigued young minds for generations. You'll have fun learning from science. **Save \$5.30 on our famous favorites!**

- Amazing Flying Bird • Fickle Foam • Whirling Gyroscope • Sun Powered Radiometer • Rainbow Maker • Space Pet

A \$28.25 Value!
SPECIAL PRICE \$22.95
PE52,380

IT'S SCIENCE FAIR TIME!

Every Detail Of Your Eye Enlarged.

Check contact lenses and inspect your own eye with our unique close-up eye inspection mirror. Our precision radius mirror with front surface coating allows you to inspect your own eye by simply holding the mirror approximately 2 inches in front of your eye. Ideal for contact lens wearers or to inspect for irritant alien particles. Mirror is 2 inches in diameter with front surface aluminized coating. **PE39,152 \$14.00**

Radiometer... A Solar Engine.

It's fascinating to watch the delicate vanes within this 5" precision-made sphere spin faster and faster illustrating the basic principles of solar heating. When light strikes the vanes it transfers heat and the vanes begin to move. Four vane rotor spins continuously at up to 3000 RPM. Works from artificial or direct sunlight. An attractive conversation piece. **Plain Glass Radiometer PE60,082 \$7.95**
Silvered Radiometer PE60,529 \$14.95

Perform Experiments With Equilateral Prisms Discovered By Sir Isaac Newton.

Prism discovery optics have three equal 60° angles, ideal for classroom demonstrations. Turn sunshine into rainbows, bend light, even make a periscope. You can perform Newton's basic dispersion of white light into the spectrum experiments. All prism faces are 25mm. **Set of 5 Acrylic Prisms PE52,885 \$26.95**
Equilateral Acrylic Prisms
75mm, **PE53,150 \$5.95**
25mm, **PE53,157 \$4.95**
100mm, **PE53,160 \$6.95**
50mm, **PE53,158 \$5.50**
150mm, **PE53,161 \$8.00**

Can You Tell Which Ball Is A Happy Bouncer, And Which Ball Is Not?

Two seemingly identical black spheres with marked differences in their physical properties. Balls are 3/4" in diameter and have the same density, mass, color and appearance; yet when dropped to the floor one jumps wildly, the other is motionless. Marvelous thought provoker for discrepant event science. Fact sheet on physical and chemical properties plus experiments for classroom use included. **PE39,129 \$4.95; PE53,619 Package of Four Pairs \$16.50**

Revolution™... A Floating/Spinning Phenomenal

Learn the science behind this fascinating near-perpetual motion device. The Revolution™ demonstrates many scientific phenomena of physics. Just place the pointed end against the glass inset and gently twirl with your fingers. Let go and watch it spin and float. **PE53,435 \$15.95**

Amazing Happy Bird Never Stops Drinking!

Fascinating to watch the Drinking Bird, it never stops drinking. Simply dunk the bird's head and release it, the Drinking Bird will bob back and forth while periodically taking a drink. May be used as a relative humidity indicator. **Ideal Science Project Aid.** Learn the science behind it! Drinking Bird's body is a glass vial filled with Freon -11 and red dye. May stain if broken. Leg supports and hat are plastic. **Package of Two PE53,617 \$9.95**

Free Standing Science Fair Project Display Boards. NSTA Approved.

Enhance your science fair projects with our expandable science fair project boards. Extra sturdy, corrugated boards are faced with white bond paper for a beautiful finished appearance. Pre-folded sides can be folded forward (as illustrated) for a free standing presentation. Boards are 36" x 24" folded; 36" x 48" expanded. **Package of 3 Boards PE52,383 \$14.95**

Build Your Own 2000° Solar Furnace With This Fresnel Lens And Harness The Sun's Rays!

Use this precision lens as a solar cooker for heating food, as a kiln for pottery - and even to melt metal or for other solar experiments. Lens has 50 lines per inch and measures 11" x 11" x 1/4" thick. Unmounted lens comes with instructions on how to build the 360° stand and frame shown. **Caution: Adult supervision required.** **PE52,833 \$22.95**

Motors By The Bag For Hobbyists & Modelmakers.

Our inexpensive motors can make wheels go 'round, propellers turn. Unlimited applications. Have fun by adding motion to your science fair projects, demonstrations and experiments with this special bag of 20, 1" motors with 1/4" long shafts. **20, 1" Motors PE1304 \$15.50**

SCIENTIFICS FREE CATALOG

Explore a fascinating world of science with over 5,000 scientific, educational, optical and products that can be adapted for science fair projects in our new, 112 page "SCIENTIFICS" color catalog. Write, call, fax or e-mail today for your FREE copy.

You Must Be Pleased! - Money Back Guarantee
If you are not completely satisfied with your purchase, return the merchandise in its original package and we will cheerfully refund your money in full.
We Back Our Products! Our 45 day unconditional guarantee means you take no risk on any product you buy from us.

Edmund Scientific Co. CONSUMER SCIENCE DIVISION
Dept. D97C, C915 Edscorp Bldg., Barrington, NJ 08007





**Science Service Publication
75th Anniversary Supplement**

Thomas Peter Bennett	Publisher
Julie Ann Miller	Editor
Blair Burns Potter	Managing Editor
Dan Skripkar	Production/Design Director
David Lindley	Associate Editor
Janet Raloff	Senior Editor Environment/Policy
Ivars Peterson	Online Editor Mathematics/Physics
Bruce Bower	Behavioral Sciences
Richard Monastersky	Internship Coordinator Earth Science
Kathleen Fackelmann, Steve Sternberg	Biomedicine
Ron Cowen	Astronomy
Tina Adler, Christine Mlot	Life Sciences
John Travis	Biology
Corinna Wu	Chemistry/ Materials Science
Paul Smaglik	Science Writer Intern
Meghan Mitchell	Editorial Assistant
Cait Anthony	Books/Advertising
Donald R. Harless	Business Manager

SCIENCE NEWS (ISSN 0036-8423) is published weekly on Saturday, except the last week in December, for \$49.50 for 1 year or \$88.00 for 2 years (foreign postage \$6.00 additional per year) by Science Service, 1719 N Street, N.W., Washington, D.C. 20036. Preferred Periodicals postage paid at Washington, D.C., and additional mailing office. **POSTMASTER:** Send address changes to SCIENCE NEWS, P.O. Box 1925, Marion, Ohio 43305. Change of address: Four to six weeks' notice is required — old and new addresses, including zip codes, must be provided. Copyright © 1997 by Science Service. Title registered as trademark U.S. and Canadian Patent Offices. Printed in U.S.A. on recycled paper. ♻️ Republication of any portion of SCIENCE NEWS without written permission of the publisher is prohibited.

Editorial and Business Offices
1719 N St. N.W., Washington, D.C. 20036
202-785-2255; scinews@scisvc.org

Advertising Representative
Lewis Edge & Associates, Inc.
366 Wall St., Princeton, N.J. 08540, 609-683-7900

Subscription Department
P.O. Box 1925, Marion, Ohio 43305
For new subscriptions only, call 1-800-247-2160.
For customer service, call 1-800-552-4412.

SCIENCE NEWS ONLINE <http://www.sciencenews.org>

S6	Letter from the Publisher
S6	A Taxonomy of Images
S8	Letter from the Editor
S9	Books
S10	Looking Back From News Wire to Newsweekly Anna Maria Gillis
S12	Time Line
S12	Looking Forward Minds Meet in the Social Whirl Bruce Bower
S13	Fractal Past, Fractal Future Ivars Peterson
S14	Nanotech: Bigger Isn't Better Corinna Wu
S15	Biology's Periodic Table John Travis
S16	Earths Beyond Earth Ron Cowen
S17	Future Health, Future Choices Kathleen Fackelmann
S18	Quantum Mechanics Gets Real David Lindley
S19	A New World of Pollutant Effects Janet Raloff
S20	The Call of Catastrophes Richard Monastersky
S21	Gene Cuisine on the Menu Steve Sternberg
S22	Poetry
S25	A Lighter Look Dr. Seeker's Future Imperfect Bruce Bower
S26	Anniversary Crossword
S27	SCIENCE NEWS: Cover to Cover



Science Service is a nonprofit corporation founded in 1921 to increase the public understanding of science. It publishes SCIENCE NEWS and administers the International Science and Engineering Fair and the Science Talent Search.

Board of Trustees — *Chairman*, Dudley Herschbach; *Vice Chairman*, Gerald F. Tape; *Secretary*, David A. Goslin; *Treasurer*, Willis Harlow Shapley; Joseph W. Berg Jr.; Robert W. Fri; J. David Hann; Shirley M. Malcom; Eve L. Menger; C. Bradley Moore; Ben Patrusky; H. Guyford Stever; Sanford J. Ungar; Deborah P. Wolfe; *Chairman Emeritus*, Glenn T. Seaborg; *Honorary Trustees*, Edward Bliss Jr.; Bowen C. Dees; Elena O. Nightingale; O.W. Riegel; John Troan.

Officers—*President*, Thomas Peter Bennett; *Vice President and Business Manager*, Donald R. Harless.