Notices

of the American Mathematical Society

EDITOR: Hugo Rossi

ASSOCIATE EDITORS:
Robert J. Daverman, Robert M. Fossum , Susan Friedlander (*Forum Editor*), Steven Krantz, Susan Landau, Andy Magid, Mary Beth Ruskai

CONTRIBUTING EDITOR: Keith Devlin

MANAGING EDITOR: Sandra Frost

SENIOR WRITER: Allyn Jackson

PRODUCTION ASSISTANTS:
Muriel Toupin, Anne-Marie Epp

PRODUCTION:
Lori Nero, Donna Salter, Deborah Smith, Peter Sykes, Maxine Wolfson

ADVERTISING SALES: Anne Newcomb

SUBSCRIPTION INFORMATION: Subscription prices for Volume 43 (1996) are $270 list; $216 institutional member; $162 Individual member. (The subscription price for members is included in the annual dues.) A late charge of 10% of the subscription price will be imposed upon orders received from nonmembers after January 1 of the subscription year. Add for postage: Surface delivery outside the United States and India—$15; in India—$34; expedited delivery to destinations in North America—$32; elsewhere—$67. Subscriptions and orders for AMS publications should be addressed tho the American Mathematical Society, P.O. Box 5904, Boston, MA 02206-5904. All orders must prepaid.

ADVERTISING: *Notices* publishes situations wanted and classified advertising, and display advertising for publishers and academic or scientific organizations.

SUBMISSIONS: The *Notices* Editorial Board encourages submission of articles on mathematics, the profession, and mathematics education, as well as shorter articles or reviews, and Letters to the Editor. Written material can be sent directly to the editors or to the Providence office.

NOTICES ON e-MATH: Most of this publication is now available electronically through e-MATH on the World Wide Web. e-MATH is the Society's resource for delivering electronic products and services to mathematicians. To access the *Notices* on e-MATH, use the URL:

`http://e-math.ams.org/`

(or `http://www.ams.org/`)

(For those with VT100-type terminals or for those without WWW browsing software, connect to e-MATH via Telnet (`telnet e-math.ams.org`; login and password e-math) and use the Lynx option from the main menu.)

[*Notices of the American Mathematical Society* is published monthly by the American Mathematical Society at 201 Charles Street, Providence, RI 02904-2213. Second class postage paid at Providence, RI and additional mailing offices. POSTMASTER: Send address change notices to *Notices of the American Mathematical Society,* P.O.Box 6248, Providence, RI 02940-6248.] Publication here of the Society's street address, and the other information in brackets above, is a technical requirement of the U.S. Postal Service. All correspondence should be mailed to the Post Office box, not the street address. Tel: 401-455-4000. e-mail: `ams@math.ams.org`.

ABOUT THE COVER

The image of a black spleenwort fern was one of the first real world images to be encoded using IFS fractals. It suggested the feasibility of compressing photographs using fractal mathematics which was later established. See article "Fractal Image Compression" by Michael F. Barnsley on page 657.

Rising to the Challenge

I've certainly had my share of times when I've been at a party, said I'm a mathematician, and watched the conversation sputter to a halt. But I've also noticed that in the last ten years:

News of Wiles's proof of Fermat's Last Theorem made the front page of the *New York Times*.

Chaos by James Gleick, a book on chaos and fractals, was on the bestseller list for months.

"Breaking the Code", a drama about Alan Turing, was a hit in London, New York, and Chicago.

PBS ran an hour-long show on Ramanujan; the program included a discussion on the number of partitions of an integer n.

"Arcadia", Tom Stoppard's play combining discussions of chaos theory, fractals, proofs, and truth, played in London, New York, and San Francisco. Program notes for the British production included an essay on chaos theory by Robert May, formerly a mathematician at Princeton and Oxford, now chief scientific advisor to the British prime minister.

Parade Magazine runs a weekly column by Marilyn vos Savant that presents problems in logic and mathematical reasoning. Is the *Parade* audience interested in the mathematics problems she discusses? Yes! Vos Savant's discussion of the Monty Hall paradox exposed millions to conditional probabilities.

Nova produced "The Mathematical Magical Mystery Tour", an hour-long special on problems in mathematics, including Fermat's Last Theorem, the Goldbach Conjecture, the Riemann Hypothesis, and the Four Color Theorem.

It is a little outside the time frame, but Rubik's Cube is too outstanding an example to miss. At its heyday in the 1980s, the Hungarian puzzle could be found in virtually every American toy store. Over a hundred million were sold. How-to-solve-it books appeared by the dozens; some even featured group theory.

Americans are interested in mathematics. What do we do about it?

Recently NSF director Neal Lane spoke on the future of science, "[S]cience can only be funded if the electorate and their representatives remain convinced of its value and contribution. These understandings … need to be routine parts of a community discourse on the goals and values of various investments that the nation could or should make.

"I believe that the new leadership needed from the research community is to carry our understanding of science and its value into the life of our own communities … [S]cientists are the only genuinely credible people to deliver the message."[1]

In February my local shopping mall sponsored an Engineering Day. Each child who visited the Society of Women Engineers table received a paper coffee filter and a handful of toothpicks and mini-marshmallows. The challenge was to build a three-dimensional structure topped by the coffee filter. The young builders could keep as many Hershey's kisses as could simultaneously lie on their filter. The children quickly learned that triangles provide stable building blocks, while quadrilaterals do not.

Much of mathematics is an abstract endeavor, but often the problems we attempt to answer are not. What does Gödel's Incompleteness Theorem really mean? Can you hear the shape of a drum? How can we determine a protein structure from a linear sequence of RNA?

Mathematicians do not have to be the odd ones out at science fairs, public schools, or university-wide science lectures. The National Security Agency has an outreach program in which researchers give talks on cryptography and mathematics—even at elementary schools. The examples above point to a strong public interest in mathematics. Will we rise to the challenge? Not only will we benefit—so will the public.

[1]*See page 673.*

—Susan Landau