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## The Future of Mathematical Communication

by Joe Christy

One of the first fruits of cooperation with LBL was the use of the MBone (Multi-Cast Backbone) to broadcast the Conference on the Future of Mathematical Communication, held at MSRI November 30-December 3, 1994. Stu Loken of LBL was one of the organizers of the meeting (along with Joe Christy, David Hoffman, John Gage, Andrew Odlyzko, and Richard Palais), and Van Jacobson of LBL, one of the fathers of the MBone, was one of the principal speakers.

Late last fall, MSRI brought together more than 150 mathematicians, librarians, software developers, representatives of scholarly societies, and both commercial and not-for-profit publishers to discuss the revolution in scholarly communication brought about by digital technology. The conference was funded by the Department of Energy, the National Science Foundation, and the Paul and Gabriella Rosenbaum Foundation. It focused on the impact of the technological revolution on mathematics, but necessarily included issues of a much wider scope. There were talks on electronic publishing, collaboration across the Internet, economic and intellectual property issues, and various new technologies which promise to carry the revolution forward. There were panel discussions of electronic documents in mathematics, the unique nature of electronic journals, technological tools, and the role of scholarly societies. There were focus groups on Developing Countries, K-12 Education, Libraries, and TeX. The meeting also embodied the promises of the revolution; it was multicast over the MBone channel of the Internet to hundreds of sites around the world and much information on the conference will be on is available our World Wide Web server at the URL <http://www.msri.org/fmc>.

We have received many comments about the meeting indicating that it has had a profound impact on how our community thinks about how scientists can communicate and make their work public. David Hoffman and Joe Christy are pursuing many projects that came into focus at the conference, some of which will be partially supported by the DOE grant mentioned above, others of which will require additional outside funding. These projects have caught the attention of John Gage of Sun Microsystems and MSRI's Board of Trustees.

1. We plan to begin regularly and routinely broadcasting notable scientific events at MSRI, beginning this summer with Persi Diaconis's lectures on Random Walks. The MBone technology has been developed at LBL and is now beginning to be embodied in commercial network hardware. Already, the FMC conference has spurred several mathematics sites to begin using the MBone to receive multicasts. While neighboring disciplines are beginning to follow the lead of the computer networking community and use the MBone for conferences and seminars, we will be breaking new ground for mathematical communication.

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2. We are seeking funding for a project to spur the use in the mathematical community of MBone technology. This will involve developing a "how-to" guide and serving as a resource to mathematical sites who wish to make use of the software, coordinating efforts to obtain both support hardware and network bandwidth for 20-30 sites, and leading in the production of content.
3. Cooperation with the UCB Library system on pilot projects in networked libraries, archiving and publication.
4. Collaborating with Sun Microsystems and the UCB Library system to set up an extensive electronic archive, including mathematics and technology. In particular this could serve as a base for a mirror site of *MathSciNet*, the online Math Reviews, and for an electronic *Pacific Journal of Mathematics*.



# The Future of Mathematical Communication

MSRI, November 30 - December 3, 1994

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This fall, MSRI will host a special conference on the Future of Mathematical Communication. The workshop is being organized by Joe Christy, John Gage, David Hoffman, Stewart Loken, Andrew Odlyzko, and Richard Palais.

In the last two years, there has been a huge increase in mathematicians' use of the Internet for communication, both formal and informal. Preprint servers have been established in several areas of mathematics. Scientific societies in the United States and abroad are exploring various sorts of electronic archiving and distribution of mathematical papers. New forms of mathematical communication - real-time video conferencing, multimedia mail, hypertext mathematical documents - are now possible. There are serious problems and open questions. The time is ripe for the mathematical community to examine issues, set goals, and coordinate efforts.

The conference will be organized around discussions, each led by experts and centered on a particular topic. There will also be six to eight lectures by leaders in their respective fields.

The discussions will be organized in order to cover the following topics:

- The various forms of electronic journals and how they are distinct from preprint servers
- Archiving, correcting and commenting on electronic documents
- The role of professional societies and traditional publishers in the transition to paperless journals
- New contents and multiple paths through a document
- Making authoring software easier to use for the creation of these new "papers"
- Verification, authentication and copyright issues
- TeX, hypertext and Mosaic
- Building bridges between researchers and elementary teachers and students
- Real-time mathematical collaboration over the Internet.

We are planning to multicast the conference in real time across the MBone channel of the Internet.

The mathematical community is warmly invited to attend. Please let us know if you plan to come. A limited amount of funding is available for partial support of people wishing to attend. Students, recent Ph.D.'s, women, and minorities are particularly encouraged to apply. To apply for funding, send a letter explaining your interest in the workshop together with a vita or bibliography, estimated travel and/or living expenses. If you are a student, also solicit a letter from a faculty advisor. All information should be received by October 1, 1994.

Shortly after October 1 there will be a mailing which will include hotel information, whatever program information is available at that time, and replies to requests for funding.

Communications about the workshop should be sent either by email to [work1194@msri.org](mailto:work1194@msri.org) or by regular mail to *Future of Mathematical Communication Conference, Mathematical Sciences Research Institute, 1000 Centennial Drive #5070, Berkeley, CA 94720-5070*. The workshop has a WWW page (accessible via mosaic, lynx, etc.) at the URL <http://www.msri.org/fmc/fmc.html>.

This conference is made possible by the support of the Department of Energy, the National Science Foundation, and The Paul and Gabriella Rosenbaum Foundation.

*The Institute is committed to the principles of Equal Opportunity and Affirmative Action.*

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# The Future of Mathematical Communication 11/30-12/3

	Wednesday	Thursday	Friday	Saturday
9:00		Van Jacobson on <b>Collaborative work across the Internet</b>	<i>Economic Issues for Information Networks</i> Jeff MacKie-Mason	<i>Copyright &amp; Intellectual Property in the 90's</i> Ann Okerson
9:30			<i>Pricing Information Goods</i> Hal Varian	<i>The ACM Electronic Publishing Plan</i> Gio Wiederhold
10:00		<i>Tea</i>	<i>Tea</i>	<i>Tea</i>
10:30		<b>WebRunner</b> James Gosling	<i>The Journal Publisher: Its Service and Cost</i> Janet Fisher	<i>Authenticating Digital Documents</i> Whitfield Diffie
11:00		<i>Portable Document Format for Mathematics</i> Deborah Triant	<i>The Journal of Universal Computer Science</i> H. Maurer	<b>Summary Discussion</b>
11:30		<i>The Electronic Journal of Combinatorics</i> Neil Calkin	<i>Documents ... Programmable</i> Stephen Wolfram	William Randolph Hearst III, Clifford Lynch, Bill Thurston
12:00		<i>Lunch and Demos</i>	<i>Lunch and Demos</i>	
12:30				
1:00	<b>Scholarly Publication at a Turning Point</b> Andrew Odlyzko			
1:30		<i>Electronic Journals, What Next?</i> Herb Wilf, moderator Alfonso Castro, Jacquelin Dietz, Larry O'Gorman	<b>Discussion of Scholarly Societies</b> Ann Okerson, moderator Jim Crowley, Joachim Luegger, Peter Michor, Dave Rodgers, Ralph Youngen	
2:00	<b>Reinventing Scholarly Communications</b> Peter Lyman			
2:30				
3:00	<i>Tea</i>	<i>Tea</i>	<i>Tea</i>	
3:30				
4:00	<b>What is a Mathematical Publication?</b> Richard Palais, moderator Paul Ginsparg, Pat Morgan, Frank Quinn, Ann Schaffner	<b>Demos</b> Focus Groups: <b>Developing Countries</b> (MSRI Library) <b>TeX</b> (MSRI Lecture Hall)	<b>Demos</b> Focus Groups: <b>High Schools</b> (MSRI Lecture Hall) <b>Libraries</b> (MSRI Library)	
4:30				
5:00		<b>Technological Tools</b> Stu Loken, moderator David Hoffman Van Jacobson Bill Johnston Deborah Triant		
5:30				
6:00				

7 PM Banquet

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**Conference on  
the Future of Mathematical Communication**

11/17/95

November 30 - December 3, 1994

at the

Mathematical Sciences Research Institute  
Berkeley, California

Roy Adler  
T.J. Watson Research Center, IBM  
P.O. Box 218  
Yorktown Heights NY 10598-0218  
adler@watson.ibm.com

James Beach  
Museum Informatics Project  
University of California Berkeley  
2111 Bancroft Way, Suite 501  
Berkeley CA 94720-6200  
beach@violet.berkeley.edu

Andres Albanese  
I.C.S.I.  
1947 Center St., Ste. 600  
Berkeley CA 94704  
aa@icsi.berkeley.edu

James Bean  
Department of Engineering  
University of Michigan  
1205 Beal Street  
Ann Arbor MI 48109-2117  
james.bean@umich.edu

D. Albers  
Mathematical Association of America  
Dolciani Mathematical Center, 1529 18th St.  
N.W.  
Washington, D.C. 20036-1358  
dalbers@maa.org

Nelson Beebe  
Department of Mathematics  
University of Utah  
Salt Lake City UT 84112  
beebe@math.utah.edu

John Alexander  
National Academy of Sciences  
2101 Constitution Ave.  
Washington, D.C. 20418-0001

Pam Bishop  
CTI Center for Mathematics and Statistics  
Center for Computer-Based Learning  
University of Birmingham  
Birmingham B15 2TT England  
ctimath@bham.ac.uk

Tim Arnold  
Department of Statistics  
North Carolina State University  
Box 8203  
Raleigh NC 27695  
arnold@stat.ncsu.edu

Robert Bixby  
Rice University  
Houston TX 77251  
bixby@pivot.cam.rice.edu

Pierre Barrat  
Department of Mathematics  
Université de Paris VII  
Tour 45-55, 2 Place Jussieu  
Paris, Cedex 05 75251 France  
barrat@paris7.jussieu.fr

Nancy Blachman  
Variable Symbols, Inc.  
6537 Chabot Road  
Oakland CA 94618-1618  
nb@cs.stanford.edu  
(510) 652-8515  
(510) 652-8461 FX

Przemyslaw Bogacki  
Department of Mathematics  
Old Dominion University  
Norfolk VA 23529-0077  
bogacki@math.odu.edu

Fred Bowers  
Department of Mathematics  
Spelman College  
Box 216  
Atlanta GA 30314

Jerry Brackbill  
Los Alamos National Laboratory  
Fluid Dynamics, MSB216  
Los Alamos NM 87545  
jub@lanl.gov

David Brillinger  
Department of Statistics  
University of California Berkeley  
Berkeley CA 94720  
brill@gandalf.berkeley.edu

Michael Brundage  
5212 University Way NE, Apt. 202  
Seattle WA 98105  
brundage@math.washington.edu

Drew Burton  
American Mathematical Society  
P.O. Box 6248  
Providence RI 02904-2213  
drb@math.ams.org

Randy Bush  
9501 S. W. Westhaven Dr.  
Portland OR 97225  
randy@psg.com

Neil Calkin  
School of Mathematics  
Georgia Institute of Technology  
Atlanta GA 30332  
calkin@math.gatech.edu

H.E.A. Campbell  
Department of Mathematics  
Queen's University  
Kingston, Ontario K7L 3N6 Canada  
eddy@mast.QueensU.CA

Antonio Capani  
Dipartimento de Matematica  
Universita di Genova  
Viale L.B. Alberti, 4  
Genova 16132 Italy  
cap@dima.unige.it

Alfonso Castro  
Department of Mathematics  
University of North Texas  
P.O. Box 5116  
Denton TX 76203-0116  
acastro@unt.edu

Jean Cea  
Université de Nice  
Nice France  
cea@unice.fr

Gerald Chachere  
Department of Mathematics  
Howard University  
Washington DC 20059  
grc@scs.howard.edu

Joseph Christy  
Mathematical Sciences Research Institute  
1000 Centennial Drive  
Berkeley CA 94720-5070  
joe@msri.org

Francis Clarke  
Department of Mathematics  
University College Swansea  
Swansea, Wales SA2 8PP U.K.  
F.Clarke@Swansea.ac.uk

Stephen Cohn  
Duke University Press  
Box 90660  
Durham NC 27708-0660  
stevec@acpub.duke.edu

David Collingwood  
Department of Mathematics  
University of Washington  
Seattle WA 98195  
colling@math.washington.edu

Paul Concus  
Lawrence Berkeley Laboratory  
1 Cyclotron Rd.  
Berkeley CA 94720  
p\_concus@lbl.gov

Jim Crowley  
SIAM  
3600 University Science Center  
Philadelphia PA 19104-2688  
crowley@siam.org

James Davenport  
School of Mathematical Sciences  
University of Bath  
Bath BA2 7AY UK  
jhd@maths.bath.ac.uk

Colin Day  
University of Michigan  
Ann Arbor MI 48109  
colinday@umich.edu

Rafael de la Llave  
Department of Mathematics  
University of Texas at Austin  
Austin TX 78712  
llave@math.utexas.edu

Andrew Dean  
deandean@netcom.com

Percy Deift  
New York University, Courant Institute  
251 Mercer Street  
New York NY 10012  
deift@math5.cims.nyu.edu

Keith Dennis  
Department of Mathematics  
Cornell University  
Ithaca NY 14853  
dennis@math.cornell.edu

Jacquelin Dietz  
Department of Statistics  
North Carolina State University  
Raleigh NC 27695  
dietz@stat.ncsu.edu

Whitfield Diffie  
Sun Microsystems  
2550 Garcia Ave., MS UMPK14-305  
Mountain View CA 94043  
whitfield.diffie@eng.sun.com  
(415) 786-6359 PH  
(415) 786-6445 FX

Vlastimil Dlab  
Department of Mathematics  
Carleton University  
4328 Herzberg Bldg., 1125 Colonel By Drive  
Ottawa, Ontario K1N 6N5 Canada  
vdlab@math.carleton.ca

Rich Dodenhoff  
Journals Manager  
American Statistical Association  
1429 Duke Street  
Alexandria VA 22314-3402  
rich@asa.mhs.comuserv.com

Michael Doob  
University of Manitoba  
Winnipeg Manitoba R3T 2N2 Canada  
mdoob@cc.umanitoba.ca

Cynthia Dwork  
IBM, Almaden Research Center  
  
dwork@almaden.ibm.com

Jack Edmonds  
Department of Mathematics  
University of Waterloo  
Waterloo, Ontario N2L 3G1 Canada  
jedmonds@math.uwaterloo.edu

Jeff Edmonds  
I.C.S.I  
1947 Center St., Ste. 600  
Berkeley CA 94704  
edmonds@ICSI.Berkeley.EDU

Ignatius Esele  
Center for the Mathematical Sciences  
University of Wisconsin  
Madison WI 53706-1149  
esele@cms.wisc.edu

Craig Evans  
Department of Mathematics  
University of California Berkeley  
Berkeley CA 94720  
evans@math.berkeley.edu

Newton Faller  
I.C.S.I.  
1947 Center St., Ste. 600  
Berkeley CA 94704  
faller@nce.ufrj.br

Timothy Ferris  
Journalism Department  
University of California Berkeley  
120 Northgate Hall  
Berkeley CA 94720

Janet Fisher  
Massachusetts Institute of Technology  
Cambridge MA 02139  
JFISHER@mitvma.mit.edu

Frank Flaherty  
Department of Mathematics  
Oregon State University  
Corvallis OR 97331  
flaherty@math.orst.edu

Dominique Foata  
Department of Mathematics  
Université Louis Pasteur  
7 rue René Descartes  
Strasbourg, Cedex 67084 France  
foata@math.u-strasbg.fr

Aviezri Fraenkel  
Department of Applied Mathematics  
Weizmann Institute of Science  
P.O. Box 26  
Rehovot 76100 Israel  
fraenkel@wisdom.weizmann.ac.il

John Franks  
Northwestern University  
Evanston IL 60208  
john@math.nwu.edu

Andrew Granville  
Department of Mathematics  
University of Georgia  
Athens GA 30602  
Andrew.Granville@math.lsa.umich.edu

John Gage  
Sun Microsystems, Inc.  
UMTV 29-230  
Mountain View CA 94043  
john.gage@eng.sun.com

Charles Gunn  
Sonderforschungsbereich 288  
Technical Universität Berlin  
Straße des 17 Juni 136  
Berlin 10623 Germany  
gunn@sfb288.math.tu-berlin.de

Lucy Garnett  
Department of Mathematics  
CUNY Graduate Center  
33 W. 42nd Street  
New York NY 10036

Hubert Halkin  
Department of Mathematics  
University of California San Diego  
La Jolla CA 92093  
hhalkin@ucsd.edu

Ruediger Gebauer  
Springer-Verlag, Inc.  
175 Fifth Ave.  
New York NY 10010  
rgebauer@springer-ny.com

Alan Harvey  
Cambridge University Press  
Stanford University  
West Coast Office, Press Bldg.  
Stanford CA 94305-2235  
harvey@roslin.stanford.edu

Paul Ginsparg  
Los Alamos National Laboratory  
Los Alamos NM 87545  
ginsparg@qfwfq.lanl.gov

Yoshi-Yuki Hayashi  
University of Tokyo  
7-3-1 Hongo  
Bunkyo-ku, Tokyo 113 Japan  
shosuke@card0.c.utokyo.ac.jp

Martin Goldstein  
Centre de Recherches Mathematiques  
University of Montreal  
Montreal, Quebec H3C 3J7 Canada  
goldstem@ERE.UMontreal.CA

William R. Hearst, III  
San Francisco Chronicle/Examiner  
110 Fifth St.  
San Francisco CA 94120

Jonas Gomes  
Instituto de Matematica Pura e Aplicada - IMPA  
Estrada Dona Castorina, 110  
Rio de Janeiro, RJ 22460-320 Brazil  
jonas@impa.br

Helene Hebert  
Centre de Recherches Mathematiques  
University of Montreal  
Montreal, Quebec H3C 3J7 Canada  
hebert@IRO.UMontreal.CA

Susan Hezlet  
World Scientific Publishing, Inc.

Allyn Jackson  
American Mathematical Society  
P.O. Box 6248  
Providence RI 02940-6248  
AXJ@VAX02.AMS.ORG

David Hoffman  
Mathematical Sciences Research Institute  
1000 Centennial Dr.  
Berkeley CA 94720-5070  
hoffman@msri.org

Van Jacobsen  
Lawrence Berkeley Labs  
1 Cyclotron Rd.  
Berkeley CA 94720

Roger Hunter  
TCI Software Research  
rhunter@tcisoft.com

Loki Jörgenson  
Centre for Experimental & Constructive  
Mathematics  
Simon Fraser University  
Burnaby, British Columbia V5A 1S6 Canada  
loki@cecm.sfu.ca

Lawrence Husch  
Department of Mathematics  
University of Tennessee  
121 Ayres Hall  
Knoxville TN 37996-1300  
husch@math.utk.edu

Deborah Kegel  
Science and Engineering Library  
University of California San Diego  
9500 Gilman Drive  
La Jolla CA 92093-0175

Carol Hutchins  
Library  
New York University, Courant Institute  
251 Mercer Street  
New York NY 10012  
hutchins@nyu.edu

Bob Kelly  
rakelly@aps.org

Patrick Ion  
Mathematical Reviews  
P.O. Box 8604  
Ann Arbor MI 481071-8604  
ion@math.ams.org

Gene Klotz  
klotz@forum.swarthmore.edu

Nicholas Jackiw  
smoke@well.sf.ca.us

Remi Kuku  
Department of Mathematics  
University of Ibadan  
Ibadan Nigeria  
kuku@ictp.trieste.it

Krystyna Kuperberg  
Department of Mathematics  
Auburn University  
Auburn AL 36839  
and  
Mathematical Sciences Research Institute  
1000 Centennial Drive  
Berkeley, CA 94720-5070  
kkuper@msri.org

Leslie Lamport  
Digital Equipment Corp.  
One Kendall Sq., Bldg. 650  
Cambridge MA 02139  
lamport@src.dec.com

Rebecca Lasher  
Mathematical and Computer Sciences Library  
Stanford University  
Stanford CA 94305  
RLASHER@forsythe.stanford.edu

Reinhard Laubenbacher  
Department of Mathematical Sciences  
New Mexico State University  
Las Cruces NM 88003  
rlaubenb@nmsu.edu

Mike Lawrie  
Manager: Uninet  
Foundation for Research Development  
P.O. Box 2600  
Pretoria 0001 South Africa  
mlawrie@apies.frd.ac.za

Carsten Lenum  
Euromath Center Copenhagen  
lenum@math.ku.dk

Silvio Levy  
The Geometry Center  
University of Minnesota  
Minneapolis MN 55455  
levy@geom.umn.edu

Mark Licker  
Wolfram Research, Inc.  
100 Trade Center Dr.  
Champaign IL 61820  
mlicker@wri.com

Mei-Ling Lo  
Mathematics Library  
Columbia University  
303 Mathematics Building  
New York NY 10027  
ml52@columbia.edu

Stewart Loken  
Lawrence Berkeley Labs  
1 Cyclotron Rd., Mail Stop 50B-2239  
Berkeley CA 94720  
SCLoken@lbl.gov

Alex Lopez-Ortiz  
Department of Mathematics  
University of Waterloo  
Waterloo, Ontario N2L 3G1 Canada  
alopez-o@barrow.uwaterloo.ca

Mike Luby  
I.C.S.I.  
University of California Berkeley  
Berkeley CA 94720  
luby@icsi.berkeley.edu

Joachim Luegger  
Konrad-Zuse-Zentrum für Informationstechnik  
Dept.: Software Information, Heilbronner Straße  
10  
Berlin-Wilmerdorf 10711 Germany  
luegger@ZIB-Berlin.DE

Jeff MacKie-Mason  
Department of Economics  
University of Michigan  
Ann Arbor MI 48109  
jmm@umich.edu

Dorothy Manderscheid  
Mathematics Library  
Michigan State University  
101-D Wells Hall  
East Lansing MI 48824  
20676mth@msu.edu

Patricia Manning  
SIAM  
3600 University City Science Center  
Philadelphia PA 19104-2688  
manning@siam.org

Joel Marchand  
Ecole Polytechnique  
Palaiseau, Cedex 91128 France  
Joel.Marchand@polytechnique.fr

Jerry Marsden  
Department of Mathematics  
University of California Berkeley  
Berkeley CA 94720  
marsden@math.berkeley.edu

Josef Mattes  
Department of Mathematics  
University of California Berkeley  
Berkeley CA 94720  
mattes@math.berkeley.edu

Hermann Maurer  
Graz University of Technology  
Austria  
hmaurer@iicm.tu-graz.ac.at

Sven Maurmann  
Mathematics  
Max-Planck-Institute  
Gottfried-Claren-Straße 26  
5300 Bonn 3 Germany  
sven@mpim-bonn.mpg.de

Dick McGehee  
The Geometry Center  
University of Minnesota  
Minneapolis MN 55455  
mcgehee@geom.umn.edu

Peter Michor  
Erwin Schroedinger Institut für Math Physik  
Pasteurgasse 6/7  
Wien A-1090 Austria  
michor@esi.ac.at

Michael Mislove  
Department of Mathematics  
Tulane University  
New Orleans LA 70118  
mwm@math.tulane.edu

Patricia Monahan  
monahan@tug.org

Calvin Moore  
University of California Berkeley  
Berkeley CA 94720  
ccmoore@math.berkeley.edu

Pat Morgan  
American Mathematical Society  
P.O. Box 6248  
Providence RI 02940-6248  
PAM@MATH.AMS.ORG

Ivan Niven  
Department of Mathematics  
University of Oregon  
Eugene OR 97403

Larry O'Gorman  
AT&T Bell Laboratories  
600 Mountain Avenue  
Murray Hill NJ 07974  
log@allegra.att.com

Shem Ochuodho  
African Regional Centre for Computing (ARCC)  
P.O. Box 58638  
Nairobi Kenya  
shem.ochuodho@arcc.kaact.kenya-net.org

Andrew Odlyzko  
AT&T Bell Laboratories  
2C-355  
Murray Hill NJ 07974  
amo@research.att.com

Ann Okerson  
Director, Office of Scientific & Academic  
Publishing  
Association of Research Libraries  
21 DuPont Circle, NW Suite 800  
Washington, D.C. 20036  
ann@cni.org

David Oliver  
GANG  
University of Massachusetts  
Amherst MA 01003  
oliver@smectos.gang.umass.edu

Richard Palais  
Department of Mathematics  
Brandeis University  
Waltham MA 02254  
palais@math.brandeis.edu

Lars Jarnbo Pedersen  
Matematisk Institut  
Københavns Universitet  
Universitetsparken 5  
Copenhagen DK-2100 Denmark  
lars.pedersen@euromath.dk

Frank Quinn  
Department of Mathematics  
Virginia Polytechnic Inst. & State University  
Blacksburg VA 24061  
quinn@calvin.math.vt.edu

John Refling  
Lawrence Berkeley Laboratories  
1 Cyclotron Rd.  
Berkeley CA 94720  
refling@sierra.lbl.gov

Peter Renz  
Academic Press  
955 Massachusetts Ave.  
Cambridge MA 02139  
wstrick@aol.com

Lorenzo Robbiano  
Dipartimento de Matematica  
Universita di Genova  
Viale L.B. Alberti, 4  
Genova 16132 Italy  
robbiano@dima.unige.it

Dave Rodgers  
University of Michigan  
Ann Arbor MI 48109

Graciela Rojas-Gonzalez  
Department of Mathematics  
Universidad Iberoamericana  
Prolongacion Paseo de la Reforma 880  
Colonia Lomas de Santa Fe 01210 DF Mexico  
grojas@newton.uia.mx

William Rowan  
P.O. 20791  
Oakland CA 94620-0791  
rowan@crl.com

Chris Rowley  
Open University  
527 Finchley Rd.  
London NW3 7BG U.K.  
C.A.Rowley@open.ac.uk

Arden Ruttan  
Department of Mathematics and Computer  
Science  
Kent State University  
Kent OH 44242-0001  
ruttan@mcs.kent.edu

Ann Schaffner  
Department of Computer Science  
Brandeis University  
Waltham MA 02254  
SCHAFFNER@LOGOS.CC.BRANDEIS.EDU

Carol Scheftic  
Associate Technology Editor  
Brooks/Cole Publishing Co.  
511 Forest Lodge Rd.  
Pacific Grove CA 93950-5098  
carol\_scheftic@brookscole.com

Andreas Schlueter  
Department of Mathematics  
Stanford University  
Stanford CA 94305-2125  
schlue@gauss.Stanford.EDU

John Selfridge  
Department of Mathematics  
Northern Illinois University  
DeKalb IL 60115  
selfridg@math.niu.edu

Mika Seppala  
University of Helsinki

Mika.Seppala@Helsinki.Fi

Xin Wei Sha  
Department of Mathematics  
Stanford University  
Stanford CA 94305  
xinwei@otter.stanford.edu

William Shadwick  
Fields Institute for Research in Mathematical  
Sciences  
185 Columbia St. West  
Waterloo, Ontario N2L 5Z5 Canada  
shadwick@fields.uwaterloo.ca

Barry Smith  
barry@bluesky.com

Neil Soiffer  
Wolfram Research, Inc.  
100 Trade Center Dr.  
Champaign IL 61820  
@wri.com

Bob Solovay  
Department of Mathematics  
University of California Berkeley  
Berkeley CA 94720  
solovay@math.berkeley.edu

Mark Steinberger  
Department of Mathematics  
SUNY at Albany  
Albany NY 12222  
mark@sarah.albany.edu

Susan Stone  
University of California Berkeley  
Berkeley CA 94720  
sstone@violet.berkeley.edu

Hal Varian  
Department of Economics  
University of Michigan  
Ann Arbor MI 48109  
hal@alfred.econ.lsa.umich.edu

Daniel Szyld  
Temple University  
Philadelphia PA 19122-2595  
szyl@math.temple.edu

William Velez  
Department of Mathematics  
University of Arizona  
Bldg. 89, Room 117  
Tucson AZ 85721-0001

Flemming Topsoe  
Matematisk Institut  
Københavns Universitet  
Universitetsparken 5  
Copenhagen DK-2100 Denmark  
topsoe@euromath.dk

velez@math.arizona.edu

Deborah Triant  
Adobe Systems  
1585 Charleston Road, P.O. Box 7900  
Mountain View CA 92039-7900

Luiz Velho  
Mathematics  
IMPA  
Estrada Dona Castorina 110  
Rio de Janeiro RJ 22460 Brazil  
luelho@impa.br

Bruce Trumbo  
Department of Statistics  
California State University at Hayward  
Hayward CA  
BTRUMBO@darwin.sci.csuhayward.edu

Dumisani Vuma  
Department of Mathematics  
University of Zimbabwe  
P.O. MP 167  
Mount Pleasant, Harare Zimbabwe  
Vuma@esanet.zw

Martha Tucker  
Mathematics Research Library  
University of Washington  
GN-50  
Seattle WA 98195  
mtucker@math.washington.edu

Sylvia Walsh  
Mathematical Sciences Library  
Rutgers University  
Hill Center  
New Brunswick NJ 08903  
swalsh@math.rutgers.edu

Victor van Beuren  
Elsevier Science, Inc.  
655 Avenue of the Americas  
New York NY 10010  
vvb@panix.com, v.vanbeuren@elsevier.com

Gene Wayne  
Department of Mathematics  
Pennsylvania State University  
University Park PA 16802  
wayne@math.psu.edu

Bruce Weiner  
Mindcraft, Inc.

bruce@mindcraft.com

Alan Weinstein  
Department of Mathematics  
University of California Berkeley  
Berkeley CA 94720  
alanw@math.berkeley.edu

Herbert Wilf  
University of Pennsylvania  
209 South 33rd Street  
Philadelphia PA 19104  
wilf@central.cis.upenn.edu

Peter Woit  
Department of Mathematics  
Columbia University  
New York NY 10027  
woit@gondor.math.columbia.edu

Joseph Wolf  
Department of Mathematics  
University of California Berkeley  
Berkeley CA 94720  
jawolf@math.berkeley.edu

Stephen Wolfram  
Wolfram Research, Inc.  
100 Trade Center Dr.  
Champaign IL 61820  
sw@wri.com

Allan Wylde  
TELOS  
Springer-Verlag  
3600 Pruneridge Ave. Ste. 200  
Santa Clara CA 95051  
allan.wylde@telospub.com

Ralph Youngen  
American Mathematical Society  
P.O. Box 6248  
Providence RI 029045-2213  
rey@math.ams.org

Fred Yuengling  
Science Library  
University of California Santa Cruz  
Santa Cruz CA 95064  
yuengli@scilibx.ucsc.edu

Nancy Zachariasen  
Computer Science Library  
California Institute of Technology  
256-80  
Pasadena CA 91125  
nancy@cs.caltech.edu

Adam Zemla  
Institute of Mathematics  
Polish Academy of Sciences  
Sniadeckich 8, P.O. Box 137  
Warsaw 00-950 Poland  
adamz@impan.impan.gov.pl

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