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 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

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 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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<tr>
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<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
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<td>9:00</td>
<td>Van Jacobson on Collaborative work across the Internet</td>
<td>Economic Issues for Information Networks</td>
<td>Copyright &amp; Intellectual Property in the 90's</td>
<td>The ACM Electronic Publishing Plan</td>
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<td>Tea</td>
<td>Pricing Information Goods</td>
<td>Hal Varian</td>
<td>Gio Wiederhold</td>
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<td>10:00</td>
<td>WebRunner</td>
<td>The Journal Publisher: Its Service and Cost</td>
<td>The Journal of Universal Computer Science</td>
<td>Authenticating Digital Documents</td>
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<td>James Gosling</td>
<td>Janet Fisher</td>
<td>H. Maurer</td>
<td>Whitfield Diffie</td>
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<td>Portable Document Format for Mathematics</td>
<td>The Electronic Journal of Combinatorics</td>
<td>Documents ... Programmable</td>
<td>Summary Discussion</td>
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<td>Deborah Triant</td>
<td>Neil Calkin</td>
<td>Stephen Wolfram</td>
<td>William Randolph Hearst III, Clifford Lynch, Bill Thurston</td>
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<td>Lunch and Demos</td>
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<td>Scholarly Publication at a Turning Point</td>
<td>Electronic Journals, What Next?</td>
<td>Discussion of Scholarly Societies</td>
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<td>Andrew Odlyzko</td>
<td>Herb Wilf, moderator</td>
<td>Ann Okerson, moderator</td>
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<td>1:30</td>
<td>Reinventing Scholarly Communications</td>
<td>Alfonso Castro, Jacquelin Dietz, Larry O'Gorman</td>
<td>Jim Crowley, Joachim Luegger, Peter Michor, Dave Rodgers, Ralph Youngen</td>
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<td>What is a Mathematical Publication?</td>
<td>Focus Groups: Developing Countries</td>
<td>Focus Groups: High Schools Libraries</td>
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<td>Richard Palais, moderator</td>
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<td>Paul Ginsparg, Pat Morgan, Frank Quinn, Ann Schaffner</td>
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<td>Technological Tools</td>
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<td>Stu Loken, moderator</td>
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<td>6:00</td>
<td>David Hoffman, Van Jacobson, Bill Johnston, Deborah Triant</td>
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<td>7:00</td>
<td>7 PM Banquet</td>
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Final Participant List
for the
Conference on
the Future of Mathematical Communication
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 2TJ England
citimath@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
John Franks  
Northwestern University  
Evanston IL 60208  
john@math.nwu.edu

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

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

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

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

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

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

Andrew Granville  
Department of Mathematics  
University of Georgia  
Athens GA 30602  
Andrew.Granville@math.1sa.umich.edu

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

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

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

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

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

Helene Hebert  
Centre de Recherches Mathematiques  
University of Montreal  
Montreal, Quebec H3C 3J7 Canada  
hebert@IRO.UMontreal.CA
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  
511 Forest Lodge Rd.  
Pacific Grove CA 93950-5098  
carol_scheftic@brookscole.com

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

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

Mika Seppala  
University of Helsinki

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  
szyld@math.temple.edu

William Velez  
Department of Mathematics  
University of Arizona  
Bldg. 89, Room 117  
Tucson AZ 85721-0001  
velez@math.arizona.edu

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

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

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

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

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

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

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

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

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

Ralph Youngen
American Mathematical Society
P.O. Box 6248
Providence RI 02904-2213
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

Allan Wylde
TELOS
Springer-Verlag
3600 Pruneridge Ave. Ste. 200
Santa Clara CA 95051
allan.wylde@telospub.com
Future of Mathematical Communication Conference  
November 30-December 3, 1994  
Department of Energy  
Grant No. DE-FG03-95ER25234

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