

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

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.

PLEASE POST

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

	Wednesday	Thursday	Friday	Saturday
9:00		Van Jacobson on Collaborative work across the Internet	<i>Economic Issues for Information Networks</i> Jeff MacKie-Mason	<i>Copyright & 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		Tea	Tea	Tea
10:30		WebRunner 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	Summary Discussion William Randolph Hearst III, Clifford Lynch, Bill Thurston
11:30		<i>The Electronic Journal of Combinatorics</i> Neil Calkin	<i>Documents ... Programmable</i> Stephen Wolfram	
12:00		Lunch and Demos	Lunch and Demos	
12:30				
1:00	Scholarly Publication at a Turning Point Andrew Odlyzko	Electronic Journals, What Next? Herb Wilf, moderator Alfonso Castro, Jacquelin Dietz, Larry O'Gorman	Discussion of Scholarly Societies Ann Okerson, moderator Jim Crowley, Joachim Luegger, Peter Michor, Dave Rodgers, Ralph Youngen	
1:30				
2:00	Reinventing Scholarly Communications Peter Lyman			
2:30				
3:00	Tea	Tea	Tea	
3:30				
4:00	What is a Mathematical Publication? Richard Palais, moderator Paul Ginsparg, Pat Morgan, Frank Quinn, Ann Schaffner	Demos Focus Groups: Developing Countries (MSRI Library) T_EX (MSRI Lecture Hall)	Demos Focus Groups: High Schools (MSRI Lecture Hall) Libraries (MSRI Library)	
4:30				
5:00		Technological Tools Stu Loken, moderator David Hoffman Van Jacobson Bill Johnston Deborah Triant		
5:30				
6:00				

7 PM Banquet

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for the

11/17/95

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November 30 - December 3, 1994

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